From:	James Nicita
To:	Pete Walter
Subject:	Planning Commission hearing on CP 17-02, DP 17-03, and NR 17- 04 -- McLoughlin Neighborhood Association Comments
Date:	Monday, September 11, 2017 12:52:25 PM
Attachments:	Final Minutes - Steering Committee Meeting 2-2-17.pdf

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Pete,

I am writing this email on behalf of the McLoughlin Neighborhood Association, in my capacity as Secretary of the Association.

At our last meeting, we voted to submit comments on the above referenced Planning Commission review of the Abernethy Place Hotel, and to submit the minutes of our meeting in February at which Mr. Foley and Mr. Hill presented.

Other comments are still being prepared, but for the time being attached please find the minutes, which include comments from individual MNA members. Please enter these minutes and this email into the record.

Thanks, Pete.

James Nicita, Secretary
McLoughlin Neighborhood Association
Oregon City

McLOUGHLIN
NEIGHBORHOOD
ASSOCIATION

Post Office Box 1027, Oregon City, Oregon 97045 • www.mnaoc.org

Steering Committee Meeting Minutes

February 2, 2017
Main Fire Station- 624 7th Street- 2nd floor
7:00 pm

Agenda (Ex. A):

7:00 pm 1. Welcome & introductions

Members and guests introduced themselves. The sign-in sheet is attached. (Ex. B.)

7:05 pm 2. Speakers/Presentation:

a. Downtown Oregon City Initiatives: Jonathan Stone

Jonathan Stone circulated a presentation he planned to give to the CIC. (Ex. C.) The Downtown Oregon City Association (DOCA) is now operating the Oregon City Elevator. DOCA had been approached by the City to find a replacement operator, then realized they could fulfill the role. They submitted a bid in response to the RFP, and were selected. Stone is now managing the operation and its staff.

Stone noted that according to TripAdvisor, the Elevator is the number one thing to do in Oregon City. There is nothing as viral from a social media standpoint as the Elevator. It is an untapped resource, and an easy sell for tourists. Every time someone rides from lower to upper level and vice versa, they encounter an elevator operator, who can provide information to tourists.

Given downtown's geographic separation from the rest of Oregon City, downtown has to consider itself a destination and operate accordingly. It is not the center of Oregon City but the edge. DOCA wants to get people in the neighborhoods to visit their own downtown.

The first step DOCA took was to remove the plexiglass separating the operator from the customers. It is more interactive and engaging. Children now can press the buttons on the elevator, adding to the experience.

Upon assumption of the contract, DOCA is representing not just downtown but the entire city. Rocky Smith is representing the McLoughlin Neighborhood. Denyse McGriff pointed out that the DOCA did not approach the MNA regarding whom the MNA wanted to represent the neighborhood.

The Elevator now has four paid staff, including a manager. The elevator staff will focus on customer experience and information gathering. The manager will guide the operators to give better information to residents and visitors.

DOCA wants to expand the presence of the Elevator on social media. The operators now have prominent name tags. They are working to clean up clutter, and want to make application for grants. The City is considering funds for replacing the windows in the observatory. DOCA wants to develop a guidebook, and handouts for local residents as well as visitors. They want to explore more traditional uniforms for the Elevator operators. This would identify the operators as such, and restore a tradition of service.

Ideas for the future include establishing a kiosk visitors center at the top of the Elevator on the Promenade, and to add docents and walking tours. DOCA wants to recruit volunteers.

Stone said Sandra of the hat store Leave Your Hat On is prepared to provide hats for the Elevator operators. Bill Daniels suggested reviving of the tradition of "free passes" that used to be given away as tourist tokens. Denyse McGriff passed around a historic pass signed by former mayor Dean Nichols.

Louisa Gonyou asked about security and restrooms. Stone said DOCA will be working on better integration with the security camera system. Right now there is no camera in the Elevator cab itself. He said there is a restroom at the top of the Elevator. It is "scary" and not open to the public. DOCA had introduced the idea for restrooms at the City Commission retreat.

Stone said regarding existing employees that all applicants who applied were interviewed. Not all of the existing operators applied. There were some who were planning to retire anyway. Some were on the fence and did not apply by the deadline DOCA had set. James King volunteered. Denyse will be the alternate.

Bill Daniels proposed that the operators get CPR training. Stone thought that was a good idea and DOCA was very interested in emergency preparedness. He thinks CPR can be considered as a continuing education subject.

Denyse proposed that the MNA be able to appoint its own representative to serve on the DOCA committee with Rocky Smith. Stone was amenable to this idea.

7:40 pm b. Review of proposed mixed use project at 17th & Washington Streets- Historic Properties- Mark Foley/Lloyd Hill

Lloyd Hill, architect, made a presentation on a proposed hotel along Washington Street near the End of the Trail Interpretive Center. Historic Properties is the proposed developer. The hotel would be a Hampton Inn & Suites by Hilton. Hill said that the area around the Rossman Landfill is "underdeveloped." There are older buildings on the proposed site, and some vacant property. Because of its location at the end of the existing downtown grid, the proposed hotel could be a link between the existing downtown and the future development on the North End.

He said that the City's zoning were encouraging mixed use development in the area. This proposal started in 2013. The Tri-Cities sewer line cuts the property in half. Six foot line and easement. Hilton is requiring 100 rooms, and some meeting space. It will be business and travel oriented. It is one of the nicer "limited service" brands. He had tried several scenarios. One corner is right off

the flood zone. The hotel would be built "above the flood zone." A glass stairway column will be the signature element. A "glowing lantern."

He designed the hotel to be higher. More floors meant that they did not have to displace the Hackett House. Five floors. There is a 75-foot height limit. There is an exception for buildings within 500 feet of the End of the Oregon Trail. So they will be asking for a variance to the 45-foot height limit.

The other end of the project is a mixed use development with residential, four floors over commercial. The façade would front along Washington Street. It wraps around the driveway to the Amtrak Station. This driveway is owned by the urban renewal agency but will soon be transferred to the City. There will be 30-33 apartments per floor, for about 130 apartments total.

Bryon Boyce from the 2 Rivers Neighborhood Association joined the meeting at this point.

Hill described the apartment complex as "pioneering," and so there was a lot of parking so as to counter any perception that there is not enough parking.

Denyse McGriff said the Hackett House is a historic resource, and the asked for an elevation of the hotel on the Hackett House side. Hill responded that all four sides are designed elevations. The apartments are within the height restrictions. There might be an opportunity for a pedestrian connection down into Abernethy Creek.

Trent Premore asked about energy efficiency. Hill responded lighting, HVAC, etc. would be considered in concert with the Energy Trust of Oregon. LED lighting has eclipsed compact fluorescent in the past two years.

Cameron McCredie asked about relations with the City staff. Mark Foley said that there had been a lot of iterations presented to the City and that he thinks they are getting closer. Hill said the pioneering nature of the project made a lot of iterations necessary. The firm has had to balance the rent structure of area with other considerations. Foley said they considered putting the entire area on a podium but it got too expensive.

8:10 pm 3. Request for expenditure of funds- meeting notice signs

Denyse McGriff asked for approval of up to $50 to make a meeting notice sign to indicate meetings held at the library. Damon Mabee so moved and Bill Daniels seconded. Ayes had it; no noes or abstentions.

4. Set dates for 2017 meetings

Denyse reported that there are technical difficulties with the automatic door at the Library, so the recommendation is that the MNA have its general meetings at the Library and the steering committee meetings at the Fire Station. The City has a lease agreement with the fire district that allows certain community access. Denyse spoke with the fire district. The district was allowing a lot of groups in, and a particular group had members who were in the non-public access areas of the station. This caused security breaches. So the district shut down access. Denyse said that MNA will have access to the fire station on a case by case basis because of our good track record. March 2, May 4, September 7, November 3 for general meetings.

5. Antique Fair participation? - August 27, 2017

Denyse reported that MNA has already been invited to Antique Fair for sno-cone sales.

6. Concerts in the Park participation?

Denyse proposed meeting on Thursday June 6th, unless we participate in Concerts in the Park. In that case it will be June 13th.

7. Proposed OC Bike rack design & recommendations for locations

Shelly Batty forwarded a design for bike racks that mimicked the Oregon City Arch Bridge (Ex. D), and requested approval. She was also interested in sites to put them at. Several sites were suggested.

8. Parks Update

Bill Daniels has been appointed to the Parks & Recreation Advisory Board.

Bryon Boyce gave a report from the Oregon City Parks Foundation. He said they are developing a plan for ivy removal in Water Board Park. They would be replaced with trails. He also said that they want to recruit volunteers to pull weeds in Atkinson Park so that the City does not have to use pesticides or herbicides. Several members volunteered. Jesse Buss suggested announcing that at the general meeting.

Denyse reported that in December the Latourette Park group had a "cocoa in the park" event. They have been having a once-a-month soup gathering for planning. There have been three design sessions.

9. Carnegie Park signs/slide- meeting with Phil Lewis & Maureen Cole

Bill Daniels gave an update on the removed sign at the Library. The City agreed that it could come up with money for replacing the missing signs, and the MNA could have a fundraiser for some of the money.

10. Buena Vista Club House- meeting with Phil Lewis

Denyse reported that the City's response on the Club House is still slow. It is unsecured, unlit, and unheated. Historic architect Todd Iselin has evaluated the building and determined that it not beyond repair.

11. Water Board Park Court case update

Jesse Buss gave an update on the litigation concerning the Water Board Park case. There were two types of cases filed: a writ of review and a Uniform Declaratory Judgments Act case. Judge Weber of Clackamas County Circuit Court has decided not to proceed with the writ of review, and proceed with the declaratory judgment case. Jesse reported that he filed a motion to consolidate the two cases eight months ago, but the judge has never ruled on the motion.

12. Willamette Falls Legacy Project- update

Denyse will be meeting with Christina Robertson-Gardiner regarding why the WFLP is not utilizing historic information that numerous parties have submitted. There is also consideration of having a discussion with the State Historic Preservation Office.

13. Public Works Master plan- update

Damon Mabee gave a report on meetings with the Department of Public Works and DECA architects on progression of the design since the MNA made comments in January 2017. There have been several design changes. They are planning to be at the March 2, 2017 general meeting. They are commencing the land use application process.

Trent Premore presented a concept for the Public Works Operations Center. (Ex. E.) He had attended the Historic Review Board meeting. He obtained a copy of the guidelines for new construction, and he thinks both Public Works and HRB need to address these guidelines. For example, the design cuts off sunlight to a neighboring building on Center Street. He felt the guidelines required Public Works to give a residential character to its new buildings on Center Street.

He has discussed his concerns with Martin Montalvo. James Nicita asked if Montalvo believed that Public Works was obligated to adhere to the guidelines. Premore responded that Montalvo felt that the guidelines were more aspirational. The MNA disagrees.

9:45 pm 14. For the good of the order/adjourn-

The meeting adjourned at 9:45 p.m. Next MNA meeting- March 2, 2017 at the Library

Approved by the Steering Committee on April 6, 2017.

Respectfully Submitted,

Jim Nicita, Secretary

McLOUGHLIN



NEIGHBORHOOD ASSOCIATION

Steering Committee Meeting Agenda

February 2, 2017
Main Fire Station- 624 7th Street- 2nd floor
7:00 pm

7:00 pm	1.	Welcome & introductions Welcome to the 2 Rivers Neighborhood Association
7:05 pm	2.	Speakers/Presentation: a. Downtown Oregon City Initiatives: Jonathan Stone
7:30 pm		b. Review of proposed mixed use project at 17th & Washington Streets- Historic Properties- Mark Foley/Lloyd Hill
8:00 pm	3.	Request for expenditure of funds- meeting notice signs
	4.	Set dates for 2017 meetings
	5.	Antique Fair participation? - August 27, 2017
	6.	Concerts in the Park participation?
	7.	Proposed OC Bike rack design & recommendations for locations
	8.	Latourette Park update
	9.	Carnegie Park signs/slide- meeting with Lewis & Cole
	10.	Buena Vista Club House- meeting with Phil Lewis a. Recommendation from Oregon City Parks Foundation- Atkinson Park
	11.	Court case update
	12.	Willamette Falls Legacy Project- update
	13.	Public Works Master plan- update
9:00 pm	14.	For the good of the order/adjourn-

Next MNA meeting- March 2, 2017 at the Library

Ex. A

McLoughlin NA Sign-in Sheet

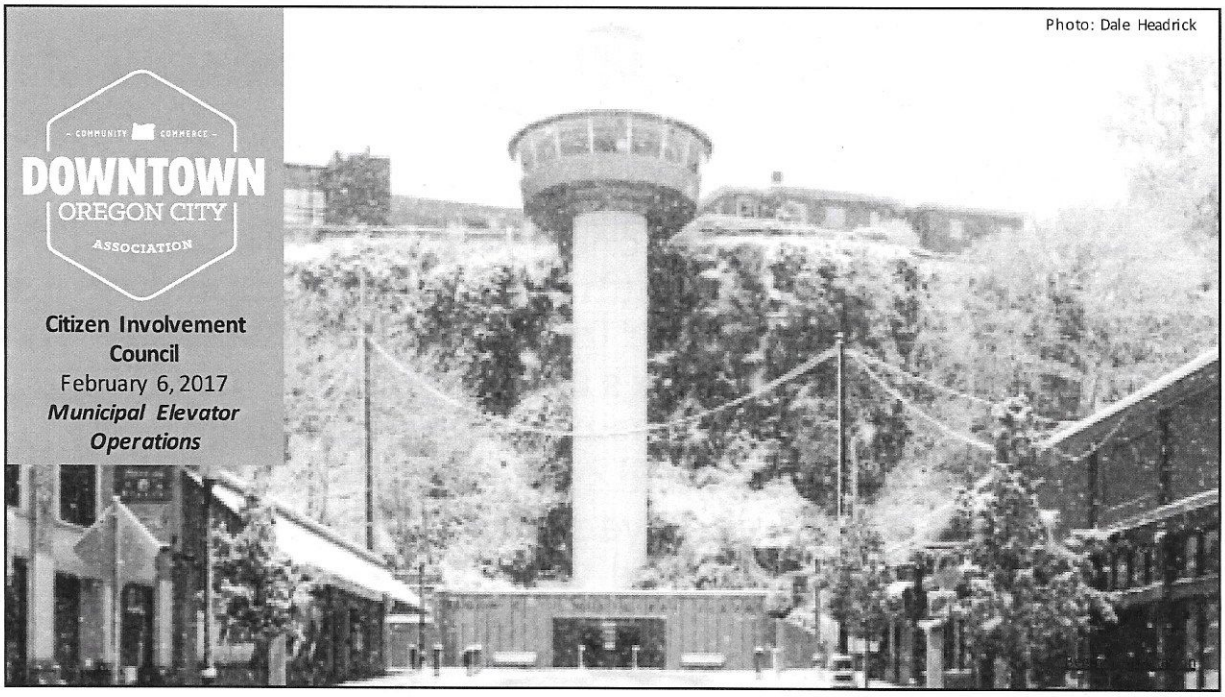
Date 2-2-17 **Time** 7pm

	Name/Business/Group/Title	Address	Phone	E-Mail
1	Denyse McGriff		503-656-3912	guthmcg@msn.com
2	Mark Foley	14725 S. Brunner Rd.	503-816-1277	mark-f@fandfstructures.com
3	Patti Foley	14725 S. Brunner Rd	503 655 0284	pattifoley@gmail.com
4	Justin Couch	818 Jackson st	503 830 1824	justincouch@yahoo.com
5	Patrick Campbell	POBOX1407 RIDGEFIELD WA	360 686-1450	—
6	Cameron McCredie	204 washington		cmccredie@realtytrust.com
7	Owen Premore	111 S. Center st.	503-729-7402	Owenpremore@yahoo.com
8	Jeanne Premore	101 S. Center St	5033197904	premorejt@gmail.com
9	TRENT "	"	5036376156	"
10	DOCA, Jonathon			
11	James Kuj	510 Monroe St	503-730-1491	_____
12	Wendy Marshall	115 Madison St.	503.358.7882	wendypaddles@gmail.com
13	BILL DANIELS	524 HIGH STREET	503.358.5864	
14	LOUISA GONYOU	101 CENTER ST	989-284-0818	WLGONYOU@GMAIL.COM
15	LLOYD HILL	1750 BLANKENSHIP RD, WEST LINN	503-781-5497	LLOYD@HILLARCHITECTS.COM
16	ANDERS OTTERLEI	" " "	503-709-5804	ANDERS.OTTERLEI@HILLARCHITECTS.COM
17	Jesse Buss	Washington St.	503-656-4884	jessebuss@gmail.com
18	Jane Nicita	Bluff St		
19	Damon Mabee	1402 Taylor	503-656-4959	
20				
21				
22				
23				
24				
25				

General (Steering) Other _____

Ex. B

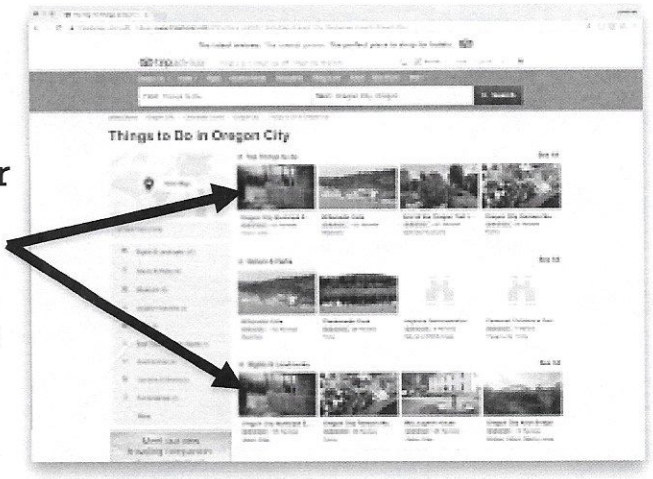

DOWNTOWN
OREGON CITY
ASSOCIATION
Citizen Involvement Council
February 6, 2017
Municipal Elevator Operations
ELEVATOR
Begin Presentation


Photo: Dale Headrick
DOWNTOWN
OREGON CITY
ASSOCIATION
Citizen Involvement Council
February 6, 2017
Municipal Elevator Operations

Ex. C

Did you know?

According to TripAdvisor the elevator is the **number one** "Thing To Do" in Oregon City as well as the top site or landmark?



Economic and Community Potential

The Municipal Elevator is an untapped resource. It is one of Oregon City's most significant cultural and civic icons and is an easy sell for tourists. Elevator staff are one of the city's most prominent "front lines." By focusing on programming, marketing, and stellar service, the elevator will better serve residents, local businesses, and visitors to our community.

Current Status

- DOCA began operations on Wednesday, February 1.
  - City Contract for 3 years.
- Formed a steering committee comprised of downtown, Midtown/McLoughlin, and other community representatives.
- We hope in the future the elevator will operate on "summer" hours all year round.
  - Monday-Tuesday: 7:00am-7:00pm
  - Wednesday-Saturday: 7:00am-9:30pm
  - Sunday: 10:00am-7:00pm
- Four paid staff members operate the elevator.
  - Three part time elevator guides, one full time manager.
  - We hope to expand our staff with internships and volunteers.
- Goal: continuous improvement of the visitor experience.

Initial Objectives

- Make elevator more presentable.
  - Clean up and declutter the interior of the cab.
  - Work with city on potential physical improvements.
- Develop guidebook.
  - Cultural heritage
  - Business information
- Social media and online presence.
- Create handouts for local residents as well as visitors
  - Special events
  - Business specials
  - Attractions
- Identify ways to improve security.
- Explore more traditional uniforms.

Ideas for the Future

- Visitor Center and Concierge Services based at a new kiosk.
- Docents
- Programming
  - Starting point for walking tours (offered by others)
  - Partnership with heritage organizations
  - Accommodate visitor groups

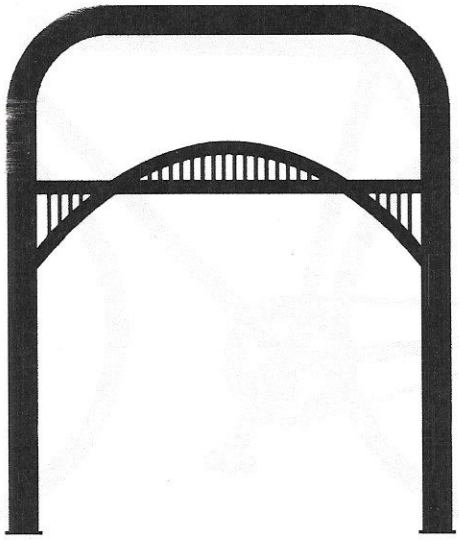
Community Support & Feedback

- We want your feedback!
- Will be soliciting public comment via comment cards and online via our website.
- Will include questions about the elevator in our upcoming community survey.
- Get involved. We are looking for qualified volunteers that are interested in helping us make our new elevator program a success.

DOWNTOWN
OREGON CITY
ASSOCIATION

Thank you!

QUESTIONS?



Ex. D

Oregon City Bike Rack
12/6/16

DERO
A PLANCORE Company

BIKE SAFETY

10 Tips for Safe Bicycle Riding

- Tell an adult if anything is broken or wrong with your bike.
- Wear a bicycle helmet.
- Wear brightly colored clothing so that others can see you better.
- Remember: one seat = only one rider!
- Keep both hands on the handlebars.
- Obey traffic signs and lights.
- Use hand signals when stopping or turning.
- Always ride in the same direction as traffic and use the right-hand side of the road.
- Look both ways before crossing the street and stay alert for cars backing out of driveways.
- When riding with others, ride in a single-file line.



Signal Left Signal Right Signal Stop

www.AAA.com
ShareTheRoad.AAA.com

Stock #3154

THREE STEPS TO A GOOD FIT

For comfort and safety, focus on three elements: size, seat and steering.

1 SIZE

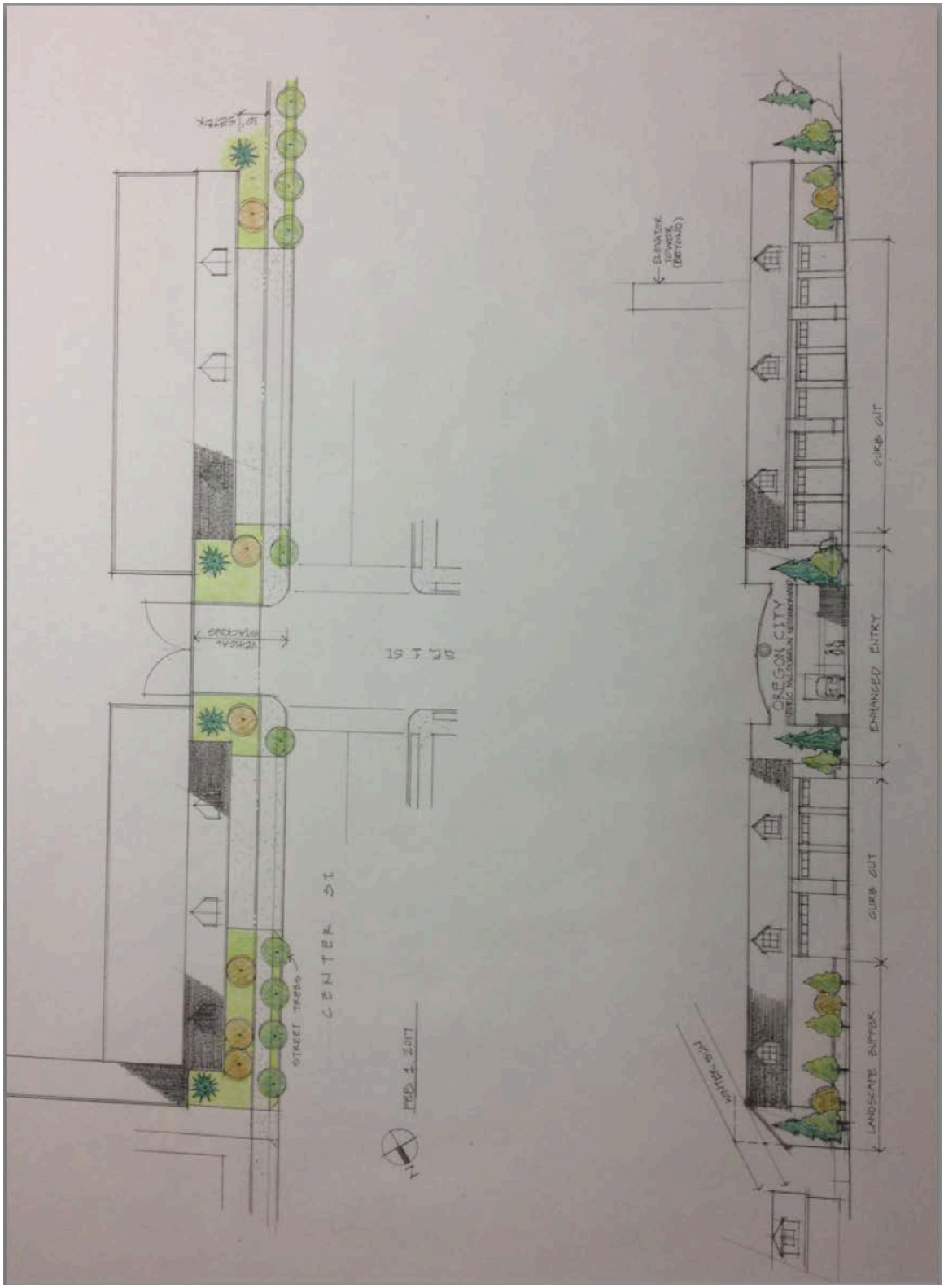
Stand over the bike and make sure there is clearance between you and the top tube . . . an inch or so for a road bike, or three to five inches for a mountain bike. When sitting on the seat, your feet should just be able to touch the ground without the bike leaning to either side.

2 SEAT

While you are seated, your leg should be slightly bent when the pedal is at its lowest rotation—not too cramped, not too stretched. Seats that are adjusted *too low can cause knee pain*; and seats set *too high can cause hamstring pain*. Make sure the seat is tightly secured and does not move from side to side or up and down.

3 STEERING

Position standard handlebars above the center bar, with grips at or above seat level. Position dropped handlebars (below the center bar) so the upper part of the bar is level with, or slightly below, the seat and tilted down. Adjust your handlebars so that 70 percent of your weight is on the seat and 30 percent is on the handlebars. Make sure your grips are not missing or loose.


CENTER ST
ST 1 ST
OREGON CITY
ENHANCED ENTRY
CURB CUT
CURB CUT
LANDSCAPE BUFFER

Ex. E

From:	James Nicita
To:	Pete Walter
Subject:	Planning Commission hearing on CP 17-02, DP 17-03, and NR 17- 04: Additional Documents for Record
Date:	Monday, September 11, 2017 12:44:42 PM
Attachments:	image001.png

Hi Pete,

Thanks for gathering the documents you provided through Sharefile.

I would like to request that those documents be added to the record of the above-referenced proceeding.

I have created a second Dropbox folder to submit them back to you for addition to the record. The folder is entitled "For Pete Walter 2".

In addition, I have also included in the folder the following:

1) Chapter 3.07 of the Metro Code

2) an 1884 map of Oregon City, including Abernethy Creek and the Clackamas Bottomlands.

It is at this link:

https://www.dropbox.com/sh/kmyl3f5a7hth6b8/AAB4rs5KJLImI4gEDhuzWy1Ya?dl=0

I respectfully request that these documents, and our email exchange, be included in the record of the above-referenced proceeding as well.

Thanks Pete,

James Nicita
Oregon City

On Thu, Sep 7, 2017 at 12:39 PM, Pete Walter <pwalter@orcity.org> wrote:

> Dear Jim,
>
> I have set up a sharefile folder for the Goal 5 items you requested
>
> https://orcity.sharefile.com/d-sb713e6937004881b
>
> Please note that this folder includes the updated Stormwater and Grading Design Standards and Erosion Control Manual from the City's legislative update in 2015. Those files were not

provided in paper form on Tuesday morning when you came in.

Thanks,

Pete Walter



Pete Walter, AICP, Planner

pwalter@orcity.org

Community Development Department

Planning Division
221 Molalla Avenue, Ste. 200
Oregon City, Oregon 97045
503-496-1568 Direct
503-722-3789 Front Desk
503-722-3880 Fax

Website: www.orcity.org

New Hours(Sept 2): 8:30 AM – 3:30 PM, M-F

Need Zoning and other Tax Lot Information? - Generate a Property Report

Online Mapping is available at OCWebMaps

Please consider the environment before printing

PUBLIC RECORDS LAW DISCLOSURE: This e-mail is subject to the State Retention Schedule and may be made available to the public.

Oregon City, OR
info@orcity.org
625 Center Street, Oregon City, OR, 97045, US

Public Records Request

City of Oregon City
625 Center St.
Oregon City, OR 97045
503-657-0891
https://orcity.seamlessdocs.com/f/PublicRecords

Name: James Nicita *
Phone: e.g. (123) 456-7890
Address: 302 Bluff Street
E-mail: james.nicita@gmail.com *
City/State/Zip: Oregon City, Oregon 97045

Provide detailed description of documents requested:

The End of the Oregon Trail District Guidelines, 1991. *

The City's compiled documents that comprise the City's Goal 5 inventory and resource list as it applies to Abernethy Creek, Clackamette Cove, Clackamas River and the Willamette River and the related acknowledgment orders that it has been able to locate with reasonable effort.

REQUESTOR TO READ AND SIGN UPON SUBMITTING REQUEST
I understand that every person has a right to inspect any public record of a public body in this state, except as

Document Signers
1 Requestor
2 Jaime Reed
3 Kattie Riggs

Create Your Signature x

Please fill in your name and email and then either draw or type your signature below.

Full Legal Name: James John Nicita
Your Initials: JJN
Email: james.nicita@gmail.com

Signature Type: Type / Draw / Upload Custom

James John Nicita

Apply Signature

I agree to electronically sign and to create a legally binding contract between the other party and myself, or the entity I am authorized to represent.

Signature will be applied to the page. You will have a chance to review after signing.

SeamlessD

Oregon City, OR
info@orcity.org
625 Center Street, Oregon City, OR, 97045, US

Public Records Request

City of Oregon City
625 Center St.
Oregon City, OR 97045
503-657-0891
https://orcity.seamlessdocs.com/f/PublicRecords

Name: James Nicita *
Phone: e.g. (123) 456-7890
Address: 302 Bluff Street
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REQUESTOR TO READ AND SIGN UPON SUBMITTING REQUEST

I understand that every person has a right to inspect any public record of a public body in this state, except as otherwise provided by ORS 192.496 to 192.505. I understand that the documents or records requested may not be immediately available for my review and that I may need to make an appointment to review the documents or records. I acknowledge that there may be a cost for the research time to retrieve the requested records and costs for duplication of requested documents. If research time is required, I understand I will be notified of the estimated cost prior to retrieving the documents or records. I also understand that prepayment for research time and copies may be required. I acknowledge that any documents or records made available to review must not be disassembled and must be left intact, and that I cannot make copies myself.

James John Nicita — 08/31/2017

Signature of Requestor — Date

Business Name *(if applicable)*:

Signature Here — Signature Here

Document Signers

1 Requestor
2 Jaime Reed
3 Kattie Riggs

Finalize & Submit

You will be able to save a copy after your submission.

SeamlessD



MAP
OF
WILLAMETTE RIVER
SHOWING THE
FALLS, CANALS & LOCKS
OF THE
O.R. & N. CO.
AT
OREGON CITY
SURVEYED 1883/84.

P. Minaker Civil Engineer. 84. N. 23.
W.H. Bussey Asst. Engr.

EXPLANATIONS.

Outlines of O.R. & N. Co's Property.
Claim Lines.
Fence Lines.
Railroad Tracks.
Survey Lines.

Brick Houses.
Frame Houses: Residences, Stores, Mills, etc.
Barns, Warehouses, Sheds & Buildings of no value.
River Banks & Bluffs of Basaltic Rock.
" " of Soft Material, Sand etc.

ELEVATIONS.

Black Figures express Elevations in feet & tenths above Datum.
50, 100 — ft Contour Lines
10 20 — 60-ft " "
15, 25 — 55 ft. " "

SOUNDINGS.

Blue Figures express Depths at Low Water in feet.
10, 20 — ft Depths.
5, 11 — ft "
Reduced to Low Water of Sept. 1853

SN1884-001

FB 639
FB 639
FB 639

CHAPTER 3.07

URBAN GROWTH MANAGEMENT FUNCTIONAL PLAN

Section Title

3.07.010 Purpose

3.07.020 Regional Policy Basis

3.07.030 Structure of Requirements

Regional Functional Plan Requirements

Title 1: Housing Capacity

3.07.110 Purpose and Intent

3.07.120 Housing Capacity

Title 2: Regional Parking Policy

(Repealed Ord. 10-1241B, Sec. 6)

Title 3: Water Quality and Flood Management

3.07.310 Intent

3.07.320 Applicability

3.07.330 Implementation Alternatives for Cities and Counties

3.07.340 Performance Standards

3.07.350 Fish and Wildlife Habitat Conservation Area

(Repealed Ord. 05—1077C, Sec. 6)

3.07.360 Metro Model Ordinance Required

3.07.370 Variances

(Repealed Ord. 05-1077C, Sec. 6)

Table 3.07-3 – Protected Water Features

Title 4: Industrial and Other Employment Areas

3.07.410 Purpose and Intent

3.07.420 Protection of Regionally Significant Industrial Areas

3.07.430 Protection of Industrial Areas

3.07.440 Protection of Employment Areas

3.07.450 Employment and Industrial Areas Map

Title 5: Neighbor Cities and Rural Reserves

(Repealed Ord. 10-1238A, Sec. 4)

Title 6: Centers, Corridors, Station Communities, and Main Streets

3.07.610 Purpose

3.07.620 Actions and Investments in Centers, Corridors, Station Communities, and Main Streets
3.07.630 Eligibility Actions for Lower Mobility Standards and Trip Generation Rates
3.07.640 Activity Levels for Centers, Corridors, Station Communities and Main Streets
3.07.650 Centers, Corridors, Station Communities and Main Streets Map

Title 7: Housing Choice

3.07.710 Intent
3.07.720 Voluntary Affordable Housing Production Goals
3.07.730 Requirements for Comprehensive Plan and Implementing Ordinance Changes
3.07.740 Inventory and Progress Reports on Housing Supply
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NOTE: The Urban Growth Management Functional Plan was adopted by the Metro Council by Ordinance No. 96-647C, and Ordinance No. 97-691C, prior to being codified as Metro Code Chapter 3.07 by Ordinance No. 97-715B.

3.07.010 Purpose

The regional policies which are adopted by this Urban Growth Management Functional Plan recommend and require changes to city and county comprehensive plans and implementing ordinances. The purpose of this functional plan is to implement regional goals and objectives adopted by the Metro Council as the Regional Urban Growth Goals and Objectives (RUGGO) including the Metro 2040 Growth Concept and the Regional Framework Plan. The comprehensive plan changes and related actions, including implementing regulations, required by this functional plan as a component of the Regional Framework Plan, shall be complied with by cities and counties as required by Section 5(e)(2) of the Metro Charter.

Any city or county determination not to incorporate all required functional plan policies into comprehensive plans shall be subject to the conflict resolution and mediation processes included within the RUGGO, Goal I provisions, prior to the final adoption of inconsistent policies or actions.

(Ordinance 97-715B, Sec. 1.)

3.07.020 Regional Policy Basis

The regional policies adopted in this Urban Growth Management Functional Plan are formulated from, and are consistent with, the RUGGOs, including the Metro 2040 Growth Concept. The overall principles of the Greenspaces Master Plan are also incorporated within this functional plan. In addition, the Regional Transportation Functional Plan (RTFP), adopted on June 10, 2010, as Metro Code 3.08, serves as the primary transportation policy implementation of the 2040 Growth Concept.

(Ordinance 97-715B, Sec. 1. Ordinance 02-972A, Sec. 1.)

3.07.030 Structure of Requirements

The Urban Growth Management Functional Plan is a regional functional plan which contains "requirements" that are binding on cities and counties of the region as well as recommendations that are not binding. “Shall” or other directive words are used with requirements. The words "should" or "may" are used with recommendations. In general, the plan is structured so that local jurisdictions may choose either performance standard requirements or prescriptive requirements. The intent of the requirements is to assure that cities and counties have a significant amount of flexibility as to how they meet requirements. Performance

standards are included in most titles. If local jurisdictions demonstrate to Metro that they meet the performance standard, they have met that requirement of the title. Standard methods of compliance are also included in the plan to establish one very specific way that jurisdictions may meet a title requirement, but these standard methods are not the only way a city or county may show compliance. In addition, certain mandatory requirements that apply to all cities and counties are established by this functional plan.

(Ordinance 97-715B, Sec. 1.)

REGIONAL FUNCTIONAL PLAN REQUIREMENTS

Title 1: Housing Capacity

3.07.110 Purpose and Intent

The Regional Framework Plan calls for a compact urban form and a "fair-share" approach to meeting regional housing needs. It is the purpose of Title 1 to accomplish these policies by requiring each city and county to maintain or increase its housing capacity except as provided in section 3.07.120.

(Ordinance 97-715B, Sec. 1. Ordinance 02-969B, Sec. 1. Ordinance 10-1244B, Sec. 2.)

3.07.120 Housing Capacity

(a) A city or county may reduce the minimum zoned capacity of the Central City or a Regional Center, Town Center, Corridor, Station Community or Main Street under subsection (d) or (e). A city or county may reduce its minimum zoned capacity in other locations under subsections (c), (d) or (e).

(b) Each city and county shall adopt a minimum dwelling unit density for each zone in which dwelling units are authorized except for zones that authorize mixed-use as defined in section 3.07.1010(gg). If a city or county has not adopted a minimum density for such a zone prior to March 16, 2011, the city or county shall adopt a minimum density that is at least 80 percent of the maximum density.

(c) A city or county may reduce its minimum zoned capacity by one of the following actions if it increases minimum zoned capacity by an equal or greater amount in other

places where the increase is reasonably likely to be realized within the 20-year planning period of Metro's last capacity analysis under ORS 197.299:

(1) Reduce the minimum dwelling unit density, described in subsection (b), for one or more zones;

(2) Revise the development criteria or standards for one or more zones; or

(3) Change its zoning map such that the city's or county's minimum zoned capacity would be reduced.

Action to reduce minimum zoned capacity may be taken any time within two years after action to increase capacity.

(d) A city or county may reduce the minimum zoned capacity of a zone without increasing minimum zoned capacity in another zone for one or more of the following purposes:

(1) To re-zone the area to allow industrial use under Title 4 of this chapter or an educational or medical facility similar in scale to those listed in section 3.07.1340(d)(5)(B)(i) of Title 13 of this chapter; or

(2) To protect natural resources pursuant to Titles 3 or 13 of this chapter.

(e) A city or county may reduce the minimum zoned capacity of a single lot or parcel so long as the reduction has a negligible effect on the city's or county's overall minimum zoned residential capacity.

(f) A city or county may amend its comprehensive plan and land use regulations to transfer minimum zoned capacity to another city or county upon a demonstration that:

(1) A transfer between designated Centers, Corridors or Station Communities does not result in a net reduction in the minimum zoned capacities of the Centers, Corridors or Station Communities involved in the transfer; and

(2) The increase in minimum zoned capacity is reasonably likely to be realized within the 20-year planning period of Metro's last capacity analysis under ORS 197.299.

(g) A city or county shall authorize the establishment of at least one accessory dwelling unit for each detached single-family dwelling unit in each zone that authorizes detached single-family dwellings. The authorization may

be subject to reasonable regulation for siting and design purposes.

(Ordinance 97-715B, Sec. 1. Ordinance 02-972A, Sec. 1. Ordinance 02-969B, Sec. 1. Ordinance 07-1137A, Sec. 1. Ordinance 10-1244B, Sec. 2. Ordinance 15-1357.)

Title 2 Regional Parking Policy

Title 2 is repealed.

(Ordinance 97-715B, Sec. 1. Ordinance 10-1241B, Sec. 6.)

Title 3: Water Quality And Flood Management

3.07.310 Intent

To protect the beneficial water uses and functions and values of resources within the Water Quality and Flood Management Areas by limiting or mitigating the impact on these areas from development activities and protecting life and property from dangers associated with flooding.

(Ordinance 97-715B, Sec. 1. Ordinance 98-730C, Sec. 1. Ordinance 00-839, Sec. 1. Ordinance 05-1077C, Sec. 6.)

3.07.320 Applicability

(a) Title 3 applies to:

(1) Development in Water Quality Resource and Flood Management Areas.

(2) Development which may cause temporary or permanent erosion on any property within the Metro Boundary.

(b) Title 3 does not apply to work necessary to protect, repair, maintain, or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies provided that after the emergency has passed, adverse impacts are mitigated in accordance with the performance standards in Section 3.07.340.

(Ordinance 97-715B, Sec. 1. Ordinance 98-730C, Sec. 1. Ordinance 00-839, Sec. 1. Ordinance 02-972A, Sec. 1. Ordinance 05-1077C, Sec. 6.)

3.07.330 Implementation Alternatives for Cities and Counties

(a) Cities and counties shall comply with this title in one of the following ways:

(1) Amend their comprehensive plans and implementing ordinances to adopt all or part of the Title 3 Model Ordinance or code language that substantially complies with the performance standards in Section 3.07.340 and the intent of this title, and adopt either the Metro Water Quality and Flood Management Area Map or a map which substantially complies with the Metro map. Cities and counties may choose one of the following options for applying this section:

(A) Adopt code language implementing this title which prevails over the map and uses the map as reference; or

(B) Adopt a city or county field verified map of Water Quality and Flood Management Areas based on the Metro Water Quality and Flood Management map implementing this title which prevails over adopted code language.

Field verification is a process of identifying or delineating Protected Water Features, Water Quality Resource Areas and Flood Management Areas shown on the Metro Water Quality and Flood Management Areas map. This process includes examination of information such as site visit reports, wetlands inventory maps, aerial photographs, and public input and review. The field verification process shall result in a locally adopted Water Quality and Flood Management Areas map which:

(i) Applies the Title 10 definitions of Protected Water Feature, Water Quality Resource Areas and Flood Management Areas to all those protected areas on the Metro Water Quality and Flood Management Areas map to show the specific boundaries of those protected areas on the locally adopted Water Quality and Flood Management Areas map; and

(ii) Is subject to amendment by applying adopted code language to add Protected Water Features, Water Quality Resource Areas and Flood Management Areas and to correct errors in the local Water Quality and Flood Management Areas map consistent with Section 3.07.330(d).

(2) Demonstrate that existing city and county comprehensive plans and implementing ordinances substantially comply with the performance standards in Section 3.07.340 and the intent of this title.

(3) Any combination of (1) and (2) above that substantially complies with all performance standards in Section 3.07.340.

(b) Cities and counties shall hold at least one public hearing prior to adopting comprehensive plan amendments, ordinances and maps implementing the performance standards in Section 3.07.340 of this title or demonstrating that existing city or county comprehensive plans and implementing ordinances substantially comply with Section 3.07.340, to add Protected Water Features, and wetlands which meet the criteria in Section 3.07.340(e)(3), to their Water Quality and Flood Management Area map. The proposed comprehensive plan amendments, implementing ordinances and maps shall be available for public review at least 45 days prior to the public hearing.

(c) Cities and counties shall conduct a review of their Water Quality and Flood Management Areas map concurrent with local periodic review required by ORS 197.629.

(d) Some areas which would otherwise be mapped as Protected Water Features, Water Quality Resource Areas and Flood Management Areas do not appear on the Metro Water Quality and Flood Management Areas map because streams had been culverted, wetlands had been filled or a fill permit had been approved, or the area was demonstrated to have existing conflicting water dependent uses, or existing plans or agreements for such uses, or the area was developed or committed to other uses.

Notwithstanding any other provision of this title, cities and counties are not required to establish Protected Water Features, Water Quality Resource Areas and Flood Management Areas through adopted code provisions or mapping for areas which were examined but not included on the Water Quality and Flood Management Areas map adopted by the Metro Council.

(Ordinance 97-715B, Sec. 1. Ordinance 98-730C, Sec. 1. Ordinance 00-839, Sec. 1. Ordinance 02-972A, Sec. 1. Ordinance 15-1357.)

3.07.340 Performance Standards

(a) Flood Management Performance Standards.

(1) The purpose of these standards is to reduce the risk of flooding, prevent or reduce risk to human life and property, and maintain functions and values of floodplains such as allowing for the storage and conveyance of stream flows through existing and natural flood conveyance systems.

(2) All development, excavation and fill in the Flood Management Areas shall conform to the following performance standards:

(A) Development, excavation and fill shall be performed in a manner to maintain or increase flood storage and conveyance capacity and not increase design flood elevations.

(B) All fill placed at or below the design flood elevation in Flood Management Areas shall be balanced with at least an equal amount of soil material removal.

(C) Excavation shall not be counted as compensating for fill if such areas will be filled with water in non-storm winter conditions.

(D) Minimum finished floor elevations for new habitable structures in the Flood Management Areas shall be at least one foot above the design flood elevation.

(E) Temporary fills permitted during construction shall be removed.

(F) Uncontained areas of hazardous materials as defined by DEQ in the Flood Management Area shall be prohibited.

(3) The following uses and activities are not subject to the requirements of subsection(2):

(A) Excavation and fill necessary to plant new trees or vegetation.

(B) Excavation and fill required for the construction of detention facilities or structures, and other facilities such as levees specifically designed to reduce or mitigate flood impacts. Levees shall not be used to create vacant buildable lands.

(C) New culverts, stream crossings, and transportation projects may be permitted if designed as balanced cut and fill projects or designed to not significantly raise the design flood elevation. Such projects shall be designed to minimize the area of fill in Flood Management Areas and to minimize erosive velocities. Stream crossing shall be as close to perpendicular to the stream as practicable. Bridges shall be used instead of culverts wherever practicable.

(b) Water Quality Performance Standards.

(1) The purpose of these standards is to: 1) protect and improve water quality to support the designated beneficial water uses as defined in Title 10, and 2) protect the functions and values of the Water Quality Resource Area which include, but are not limited to:

(A) Providing a vegetated corridor to separate Protected Water Features from development;

(B) Maintaining or reducing stream temperatures;

(C) Maintaining natural stream corridors;

(D) Minimizing erosion, nutrient and pollutant loading into water;

(E) Filtering, infiltration and natural water purification; and

(F) Stabilizing slopes to prevent landslides contributing to sedimentation of water features.

(2) Local codes shall require all development in Water Quality Resource Areas to conform to the following performance standards:

(A) The Water Quality Resource Area is the vegetated corridor and the Protected Water Feature. The width of the vegetated corridor is specified in Table 3.07-3. At least three slope measurements along the water feature, at no more than 100-foot increments, shall be made for each property for which development is proposed. Depending on the width of the property, the width of the vegetated corridor will vary.

(B) Water Quality Resource Areas shall be protected, maintained, enhanced or restored as specified in Section 3.07.340(b)(2).

(C) Prohibit development that will have a significant negative impact on the functions and values of the Water Quality Resource Area, which cannot be mitigated in accordance with subsection (2)(F).

(D) Native vegetation shall be maintained, enhanced or restored, if disturbed, in the Water Quality Resource Area. Invasive non-native or noxious vegetation may be removed from the Water Quality Resource Area. Use of native vegetation shall be encouraged to enhance or restore the Water Quality Resource Area. This shall not preclude construction of energy dissipaters at outfalls consistent with watershed enhancement, and as approved by local surface water management agencies.

(E) Uncontained areas of hazardous materials as defined by DEQ in the Water Quality Resource Area shall be prohibited.

(F) Cities and counties may allow development in Water Quality Resource Areas provided that the governing body, or its designate, implement procedures which:

(i) Demonstrate that no practicable alternatives to the requested development exist which will not disturb the Water Quality Resource Area; and

(ii) If there is no practicable alternative, limit the development to reduce the impact associated with the proposed use; and

(iii) Where the development occurs, require mitigation to ensure that the functions and values of the Water Quality Resource Area are restored.

(G) Cities and counties may allow development for repair, replacement or improvement of utility facilities so long as the Water Quality Resource Area is restored consistent with Section 3.07.340(b)(2)(D).

(H) The performance standards of Section 3.07.340(b)(2) do not apply to routine repair and maintenance of existing structures, roadways, driveways, utilities, accessory uses and other development.

(3) For lots or parcels which are fully or predominantly within the Water Quality Resource Area and are demonstrated to be unbuildable by the vegetative corridor regulations, cities and counties shall reduce or remove vegetative corridor regulations to assure the lot or parcel will be buildable while still providing the maximum vegetated corridor practicable. Cities and counties shall encourage landowners to voluntarily protect these areas through various means, such as conservation easements and incentive programs.

(c) Erosion and Sediment Control.

(1) The purpose of this section is to require erosion prevention measures and sediment control practices during and after construction to prevent the discharge of sediments.

(2) Erosion prevention techniques shall be designed to prevent visible and measurable erosion as defined in Title 10.

(3) To the extent erosion cannot be completely prevented, sediment control measures shall be designed to capture, and retain on-site, soil particles that have become dislodged by erosion.

(d) Implementation Tools to Protect Water Quality and Flood Management Areas.

(1) Cities and counties shall either adopt land use regulations, which authorize transfer of permitted units and floor area to mitigate the effects of development restrictions in Water Quality and Flood Management Areas, or adopt other measures that mitigate the effects of development restrictions.

(2) Metro encourages local governments to require that approvals of applications for partitions, subdivisions and design review actions be conditioned upon one of the following:

(A) Protection of Water Quality and Flood Management Areas with a conservation easement;

(B) Platting Water Quality and Flood Management Areas as common open space; or

(C) Offer of sale or donation of property to public agencies or private non-profits for preservation where feasible.

(3) Additions, alterations, rehabilitation or replacement of existing structures, roadways, driveways, accessory uses and development in the Water Quality and Flood Management Area may be allowed provided that:

(A) The addition, alteration, rehabilitation or replacement is not inconsistent with applicable city and county regulations, and

(B) The addition, alteration, rehabilitation or replacement does not encroach closer to the Protected Water Feature than the existing structures, roadways, driveways or accessory uses and development, and

(C) The addition, alteration, rehabilitation or replacement satisfies Section 3.07.340(c) of this title.

(D) In determining appropriate conditions of approval, the affected city or county shall require the applicant to:

(i) Demonstrate that no reasonably practicable alternative design or method of development exists that would have a lesser impact on the Water Quality Resource Area than the one proposed; and

(ii) If no such reasonably practicable alternative design or method of development exists, the project should be conditioned to limit its disturbance and impact on the Water Quality Resource to the minimum extent necessary to achieve the proposed addition, alteration, restoration, replacement or rehabilitation; and

(iii) Provide mitigation to ensure that impacts to the functions and values of the Water Quality Resource Area will be mitigated or restored to the extent practicable.

(4) Cities and counties may choose not to apply the Water Quality and Flood Management Area performance standards of Section 3.07.340 to development necessary for the placement of structures when it does not require a grading or building permit.

(5) Metro encourages cities and counties to provide for restoration and enhancement of degraded Water Quality Resource Areas through conditions of approval when development is proposed, or through incentives or other means.

(6) Cities and counties shall apply the performance standards of this title to Title 3 Wetlands as shown on the Metro Water Quality and Flood Management Areas Map and locally adopted Water Quality and Flood Management Areas maps. Cities and counties may also apply the performance standards of this title to other wetlands.

(e) Map Administration.

Cities and counties shall amend their comprehensive plans and implementing ordinances to provide a process for each of the following:

(1) Amendments to city and county adopted Water Quality and Flood Management Area maps to correct the location of Protected Water Features, Water Quality Resource Areas and Flood Management Areas. Amendments shall be initiated within 90 days of the date the city or county receives information establishing a possible map error.

(2) Modification of the Water Quality Resource Area upon demonstration that the modification will offer the same or better protection of water quality, the Water Quality and Flood Management Area and Protected Water Feature.

(3) Amendments to city and county adopted Water Quality and Flood Management Area maps to add Title 3 Wetlands when the city or county receives significant evidence that a wetland meets any one of the following criteria:

(A) The wetland is fed by surface flows, sheet flows or precipitation, and has evidence of flooding during the growing season, and has 60 percent or greater vegetated cover, and is over one-half acre in size; or

The wetland qualifies as having "intact water quality function" under the 1996 Oregon Freshwater Wetland Assessment Methodology; or

(B) The wetland is in the Flood Management Area, and has evidence of flooding during the growing season, and is five acres or more in size, and has a restricted outlet or no outlet; or

The wetland qualifies as having "intact hydrologic control function" under the 1996 Oregon Freshwater Wetland Assessment Methodology; or

(C) The wetland or a portion of the wetland is within a horizontal distance of less than one-fourth mile from a water body which meets the Department of Environmental Quality definition of "water quality limited" water body in OAR Chapter 340, Division 41.

Examples of significant evidence that a wetland exists that may meet the criteria above are a wetland assessment conducted using the 1996 Oregon Freshwater Wetland Assessment Methodology, or correspondence from the Division of State Lands that a wetland determination or delineation has been submitted or completed for property in the city or county.

(4) Cities and counties are not required to apply the criteria in Section 3.07.340(e)(3) to water quality or stormwater detention facilities.

(Ordinance 97-715B, Sec. 1. Ordinance 98-730C, Sec. 1. Ordinance 00-839, Sec. 1. Ordinance 02-972A, Sec. 1. Ordinance 05-1077C, Sec. 6. Ordinance 15-1357.)

3.07.350 Fish and Wildlife Habitat Conservation Area

(Repealed Ordinance 05-1077C, Sec. 6.)

3.07.360 Metro Model Ordinance Required

Metro shall adopt a Water Quality and Flood Management Areas Model Ordinance and map. The Model Ordinance shall represent one method of complying with this title. The Model Ordinance shall be advisory, and cities and counties are not required to adopt the Model Ordinance, or any part thereof, to

substantially comply with this title. However, cities and counties which adopt the Model Ordinance in its entirety and a Water Quality and Flood Management Areas Map shall be deemed to have substantially complied with the requirements of this title.

(Ordinance 97-715B, Sec. 1. Ordinance 98-730C, Sec. 2. Ordinance 00-839, Sec. 1. Ordinance 05-1077C, Sec. 6.)

3.07.370 Variances

(Repealed, Ordinance 05-1077C, Sec. 6.)

Table 3.07-3 - Protected Water Features

(Section 3.07.340(b)(2)(A))

Protected Water Feature Type (see definitions)	**Slope Adjacent to Protected Water Feature**	**Starting Point for Measurements from Water Feature**	**Width of Vegetated Corridor**
Primary Protected Water Features[1]	< 25%	• Edge of bankfull flow or 2-year storm level; • Delineated edge of Title 3 wetland	50 feet
Primary Protected Water Features[1]	≥ 25% for 150 feet or more[5]	• Edge of bankfull flow or 2-year storm level; • Delineated edge of Title 3 wetland	200 feet
Primary Protected Water Features[1]	≥ 25% for less than 150 feet[5]	• Edge of bankfull flow or 2-year storm level; • Delineated edge of Title 3 wetland	Distance from starting point of measurement to top of ravine (break in ≥25% slope)[3], plus 50 feet.[4]
Secondary Protected Water Features[2]	< 25%	• Edge of bankfull flow or 2-year storm level; • Delineated edge of Title 3 wetland	15 feet
Secondary Protected Water Features[2]	≥ 25%[5]	• Edge of bankfull flow or 2-year storm level; • Delineated edge of Title 3 wetland	50 feet

[1] **Primary Protected Water Features** include: all rivers, perennial streams, and streams draining greater than 100 acres, Title 3 wetlands, natural lakes and springs.

[2] **Secondary Protected Water Features** include intermittent streams draining 50-100 acres.

[3] Where the Protected Water Feature is confined by a ravine or gully, the top of ravine is the break in the ≥ 25% slope (see slope measurement in

Appendix).

[4] A maximum reduction of 25 feet may be permitted in the width of vegetated corridor beyond the slope break if a geotechnical report demonstrates that slope is stable. To establish the width of the vegetated corridor, slope should be measured in 25-foot increments away from the water feature until slope is less than 25% (top of ravine).

[5] Vegetated corridors in excess of 50-feet for primary protected features, or in excess of 15-feet for secondary protected features, apply on steep slopes only in the *uphill* direction from the protected water feature.

(Ordinance 98-730C, Sec. 1.)

Title 4: Industrial and Other Employment Areas

3.07.410 Purpose and Intent

The Regional Framework Plan calls for a strong regional economy. To improve the economy, Title 4 seeks to provide and protect a supply of sites for employment by limiting the types and scale of non-industrial uses in Regionally Significant Industrial Areas (RSIAs), Industrial and Employment Areas. Title 4 also seeks to provide the benefits of "clustering" to those industries that operate more productively and efficiently in proximity to one another than in dispersed locations. Title 4 further seeks to protect the capacity and efficiency of the region's transportation system for the movement of goods and services and to encourage the location of other types of employment in Centers, Corridors, Main Streets and Station Communities. The Metro Council will evaluate the effectiveness of Title 4 in achieving these purposes as part of its periodic analysis of the capacity of the urban growth boundary.

(Ordinance 97-715B, Sec. 1. Ordinance 02-969B, Sec. 5. Ordinance 04-1040B, Sec. 2. Ordinance 10-1244B, Sec. 3.)

3.07.420 Protection of Regionally Significant Industrial Areas

(a) Regionally Significant Industrial Areas (RSIAs) are those areas near the region's most significant transportation facilities for the movement of freight and other areas most suitable for movement and storage of goods. Each city and county with land use planning authority over RSIAs shown on the Employment and Industrial Areas Map shall derive specific plan designation and zoning district boundaries of RSIAs within its jurisdiction from the Map, taking into account the location of existing uses that would not conform to the limitations on non-industrial uses in this section and the need to achieve a mix of employment uses.

(b) Cities and counties shall review their land use regulations and revise them, if necessary, to include measures to limit the size and location of new buildings for retail commercial uses - such as stores and restaurants - and retail and professional services that cater to daily customers – such as financial, insurance, real estate, legal, medical and dental offices - to ensure that they serve primarily the needs of workers in the area. One such measure shall be that new buildings

for stores, branches, agencies or other outlets for these retail uses and services shall not occupy more than 3,000 square feet of sales or service area in a single outlet, or multiple outlets that occupy more than 20,000 square feet of sales or service area in a single building or in multiple buildings that are part of the same development project, with the following exceptions:

(1) Within the boundaries of a public use airport subject to a facilities master plan, customary airport uses, uses that are accessory to the travel-related and freight movement activities of airports, hospitality uses, and retail uses appropriate to serve the needs of the traveling public; and

(2) Training facilities whose primary purpose is to provide training to meet industrial needs.

(c) Cities and counties shall review their land use regulations and revise them, if necessary, to include measures to limit the siting and location of new buildings for the uses described in subsection (b) and for non-industrial uses that do not cater to daily customers—such as banks or insurance processing centers—to ensure that such uses do not reduce off-peak performance on Main Roadway Routes and Roadway Connectors shown on the Regional Freight Network Map in the RTP or require added road capacity to prevent falling below the standards.

(d) Cities and counties shall review their land use regulations and revise them, if necessary, to prohibit the siting of schools, places of assembly larger than 20,000 square feet or parks intended to serve people other than those working or residing in the RSIA. Nothing in this subsection is intended to prohibit trails and facilities accessory to and in support of trails from being located within an area designated RSIA on Metro's Title 4 Map, including but not limited to trailhead amenities, parking areas, benches, information kiosks, restrooms, shelters, bicycle racks, picnic areas and educational facilities. Where possible, trails and accessory facilities should be planned and located in a manner that limits impacts on industrial uses while still fulfilling the purpose of the trail and providing a positive experience for trail users.

(e) No city or county shall amend its land use regulations that apply to lands shown as RSIA on the Employment and

Industrial Areas Map to authorize uses described in subsection (b) that were not authorized prior to July 1, 2004.

(f) Cities and counties may allow division of lots or parcels into smaller lots or parcels as follows:

(1) Lots or parcels smaller than 50 acres may be divided into any number of smaller lots or parcels.

(2) Lots or parcels 50 acres or larger may be divided into smaller lots and parcels pursuant to a master plan approved by the city or county so long as the resulting division yields at least one lot or parcel of at least 50 acres in size.

(3) Lots or parcels 50 acres or larger, including those created pursuant to paragraph (2) of this subsection, may be divided into any number of smaller lots or parcels pursuant to a master plan approved by the city or county so long as at least 40 percent of the area of the lot or parcel has been developed with industrial uses or uses accessory to industrial use, and no portion has been developed, or is proposed to be developed, with uses described in subsection (b) of this section.

(4) Notwithstanding paragraphs (2) and (3) of this subsection, any lot or parcel may be divided into smaller lots or parcels or made subject to rights-of-way for the following purposes:

(A) To provide public facilities and services;

(B) To separate a portion of a lot or parcel in order to protect a natural resource, to provide a public amenity, or to implement a remediation plan for a site identified by the Oregon Department of Environmental Quality pursuant to ORS 465.225;

(C) To separate a portion of a lot or parcel containing a nonconforming use from the remainder of the lot or parcel in order to render the remainder more practical for a permitted use; or

(D) To allow the creation of a lot solely for financing purposes when the created lot is part of a master planned development.

(g) Notwithstanding subsection (b) of this section, a city or county may allow the lawful use of any building, structure or land at the time of enactment of an ordinance adopted pursuant to this section to continue and to expand to add up to 20 percent more floor area and 10 percent more land area. Notwithstanding subsection (e) of this section, a city or county may allow division of lots or parcels pursuant to a master plan approved by the city or county prior to July 1, 2004.

(Ordinance 97-715B, Sec. 1. Ordinance 02-969B, Sec. 5. Ordinance 04-1040B, Sec. 2. Ordinance 10-1244B, Sec. 3. Ordinance 14-1329B.)

3.07.430 Protection of Industrial Areas

(a) Cities and counties shall review their land use regulations and revise them, if necessary, to include measures to limit new buildings for retail commercial uses—such as stores and restaurants—and retail and professional services that cater to daily customers—such as financial, insurance, real estate, legal, medical and dental offices—in order to ensure that they serve primarily the needs of workers in the area. One such measure shall be that new buildings for stores, branches, agencies or other outlets for these retail uses and services shall not occupy more than 5,000 square feet of sales or service area in a single outlet, or multiple outlets that occupy more than 20,000 square feet of sales or service area in a single building or in multiple buildings that are part of the same development project, with the following exceptions:

(1) Within the boundaries of a public use airport subject to a facilities master plan, customary airport uses, uses that are accessory to the travel-related and freight movement activities of airports, hospitality uses, and retail uses appropriate to serve the needs of the traveling public; and

(2) Training facilities whose primary purpose is to provide training to meet industrial needs.

(b) Cities and counties shall review their land use regulations and revise them, if necessary, to include measures to limit new buildings for the uses described in subsection (a) to ensure that they do not interfere with the efficient movement of freight along Main Roadway Routes and Roadway Connectors shown on the

Regional Freight Network Map in the RTP. Such measures may include, but are not limited to, restrictions on access to freight routes and connectors, siting limitations and traffic thresholds. This subsection does not require cities and counties to include such measures to limit new other buildings or uses.

(c) No city or county shall amend its land use regulations that apply to lands shown as Industrial Area on the Employment and Industrial Areas Map to authorize uses described in subsection (a) of this section that were not authorized prior to July 1, 2004.

(d) Cities and counties may allow division of lots or parcels into smaller lots or parcels as follows:

(1) Lots or parcels smaller than 50 acres may be divided into any number of smaller lots or parcels.

(2) Lots or parcels 50 acres or larger may be divided into smaller lots and parcels pursuant to a master plan approved by the city or county so long as the resulting division yields at least one lot or parcel of at least 50 acres in size.

(3) Lots or parcels 50 acres or larger, including those created pursuant to paragraph (2) of this subsection, may be divided into any number of smaller lots or parcels pursuant to a master plan approved by the city or county so long as at least 40 percent of the area of the lot or parcel has been developed with industrial uses or uses accessory to industrial use, and no portion has been developed, or is proposed to be developed with uses described in subsection (a) of this section.

(4) Notwithstanding paragraphs (2) and (3) of this subsection, any lot or parcel may be divided into smaller lots or parcels or made subject to rights-of-way for the following purposes:

(A) To provide public facilities and services;

(B) To separate a portion of a lot or parcel in order to protect a natural resource, to provide a public amenity, or to implement a remediation plan for a site identified by the Oregon Department of Environmental Quality pursuant to ORS 465.225;

(C) To separate a portion of a lot or parcel containing a nonconforming use from the

remainder of the lot or parcel in order to render the remainder more practical for a permitted use; or

(D) To allow the creation of a lot solely for financing purposes when the created lot is part of a master planned development.

(e) Notwithstanding subsection (b) of this section, a city or county may allow the lawful use of any building, structure or land at the time of enactment of an ordinance adopted pursuant to this section to continue and to expand to add up to 20 percent more floor space and 10 percent more land area.

(Ordinance 97-715B, Sec. 1. Ordinance 02-969B, Sec. 5. Ordinance 04-1040B, Sec. 2. Ordinance 10-1244B, Sec. 3.)

3.07.440 Protection of Employment Areas

(a) Except as provided in subsections (c),(d), and (e), in Employment Areas mapped pursuant to Metro Code section 3.07.450, cities and counties shall limit new and expanded commercial retail uses to those appropriate in type and size to serve the needs of businesses, employees and residents of the Employment Areas.

(b) Except as provided in subsections (c), (d) and (e), a city or county shall not approve a commercial retail use in an Employment Area with more than 60,000 square feet of gross leasable area in a single building, or commercial retail uses with a total of more than 60,000 square feet of retail sales area on a single lot or parcel, or on contiguous lots or parcels, including those separated only by transportation right-of-way.

(c) A city or county whose zoning ordinance applies to an Employment Area and is listed on Table 3.07-4 may continue to authorize commercial retail uses with more than 60,000 square feet of gross leasable area in that zone if the ordinance authorized those uses on January 1, 2003.

(d) A city or county whose zoning ordinance applies to an Employment Area and is not listed on Table 3.07-4 may continue to authorize commercial retail uses with more than 60,000 square feet of gross leasable area in that zone if:

(1) The ordinance authorized those uses on January 1, 2003;

(2) Transportation facilities adequate to serve the commercial retail uses will be in place at the time the uses begin operation; and

(3) The comprehensive plan provides for transportation facilities adequate to serve other uses planned for the Employment Area over the planning period.

(e) A city or county may authorize new commercial retail uses with more than 60,000 square feet of gross leasable area in Employment Areas if the uses:

(1) Generate no more than a 25 percent increase in site-generated vehicle trips above permitted non-industrial uses; and

(2) Meet the Maximum Permitted Parking – Zone A requirements set forth in Table 3.08-3 of Title 4 of the Regional Transportation Functional Plan.

(Ordinance 97-715B, Sec. 1. Ordinance 02-969B, Sec. 5. Ordinance 04-1040B, Sec. 2. Ordinance 10-1244B, Sec. 3.)

3.07.450 Employment and Industrial Areas Map

(a) The Employment and Industrial Areas Map is the official depiction of the boundaries of Regionally Significant Industrial Areas, Industrial Areas and Employment Areas.

(b) If the Metro Council adds territory to the UGB and designates all or part of the territory Regionally Significant Industrial Area, Industrial Area or Employment Area, after completion of Title 11 planning by the responsible city or county, the Chief Operating Officer (COO) shall issue an order to conform the map to the boundaries established by the responsible city or county. The order shall also make necessary amendments to the Habitat Conservation Areas Map, described in section 3.07.1320 of Title 13 of this chapter, to ensure implementation of Title 13.

(c) A city or county may amend its comprehensive plan or zoning regulations to change its designation of land on the Employment and Industrial Areas Map in order to allow uses not allowed by this title upon a demonstration that:

(1) The property is not surrounded by land designated on the map as Industrial Area, Regionally Significant Industrial Area or a combination of the two;

(2) The amendment will not reduce the employment capacity of the city or county;

(3) If the map designates the property as Regionally Significant Industrial Area, the subject property does not have access to specialized services, such as redundant electrical power or industrial gases, and is not proximate to freight loading and unloading facilities, such as trans-shipment facilities;

(4) The amendment would not allow uses that would reduce off-peak performance on Main Roadway Routes and Roadway Connectors shown on the Regional Freight Network Map in the RTP below volume-to-capacity standards in the plan, unless mitigating action is taken that will restore performance to RTP standards within two years after approval of uses;

(5) The amendment would not diminish the intended function of the Central City or Regional or Town Centers as the principal locations of retail, cultural and civic services in their market areas; and

(6) If the map designates the property as Regionally Significant Industrial Area, the property subject to the amendment is ten acres or less; if designated Industrial Area, the property subject to the amendment is 20 acres or less; if designated Employment Area, the property subject to the amendment is 40 acres or less.

(d) A city or county may also amend its comprehensive plan or zoning regulations to change its designation of land on the Employment and Industrial Areas Map in order to allow uses not allowed by this title upon a demonstration that:

(1) The entire property is not buildable due to environmental constraints; or

(2) The property borders land that is not designated on the map as Industrial Area or Regionally Significant Industrial Area; and

(3) The assessed value of a building or buildings on the property, built prior to March 5, 2004, and historically occupied by uses not allowed by this title, exceeds the assessed value of the land by a ratio of 1.5 to 1.

(e) The COO shall revise the Employment and Industrial Areas Map by order to conform to an amendment made by a city or county pursuant to subsection (c) or (d) of this section within 30 days after notification by the city or county that no appeal of the amendment was filed pursuant to ORS 197.825 or, if an appeal was filed, that the amendment was upheld in the final appeal process.

(f) After consultation with MPAC, the Council may issue an order suspending operation of subsection (c) in any calendar year in which the cumulative amount of land for which the Employment and Industrial Areas Map is changed during that year from Regionally Significant Industrial Area or Industrial Area to Employment Area or other 2040 Growth Concept design type designation exceeds the industrial land surplus. The industrial land surplus is the amount by which the current supply of vacant land designated Regionally Significant Industrial Area and Industrial Area exceeds the 20-year need for industrial land, as determined by the most recent "Urban Growth Report: An Employment Land Need Analysis", reduced by an equal annual increment for the number of years since the report.

(g) The Metro Council may amend the Employment and Industrial Areas Map by ordinance at any time to make corrections in order to better achieve the policies of the Regional Framework Plan.

(h) Upon request from a city or a county, the Metro Council may amend the Employment and Industrial Areas Map by ordinance to consider proposed amendments that exceed the size standards of paragraph (6) of subsection (c) of the section. To approve an amendment, the Council must conclude that the amendment:

(1) Would not reduce the employment capacity of the city or county;

(2) Would not allow uses that would reduce off-peak performance on Main Roadway Routes and Roadway Connectors shown on the Regional Freight Network Map in the RTP below volume-to-capacity standards in the plan, unless mitigating action is taken that will restore performance to RTP standards within two years after approval of uses;

(3) Would not diminish the intended function of the Central City or Regional or Town Centers as the principal locations of retail, cultural and civic services in their market areas;

(4) Would not reduce the integrity or viability of a traded sector cluster of industries;

(5) Would not create or worsen a significant imbalance between jobs and housing in a regional market area; and

(6) If the subject property is designated Regionally Significant Industrial Area, would not remove from that designation land that is especially suitable for industrial use due to the availability of specialized services, such as redundant electrical power or industrial gases, or due to proximity to freight transport facilities, such as trans-shipment facilities.

(i) Amendments to the Employment and Industrial Areas Map made in compliance with the process and criteria in this section shall be deemed to comply with the Regional Framework Plan.

(j) The Council may establish conditions upon approval of an amendment to the Employment and Industrial Areas Map under subsection (f) to ensure that the amendment complies with the Regional Framework Plan and state land use planning laws.

(k) By January 31 of each year, the COO shall submit a written report to the Council and MPAC on the cumulative effects on employment land in the region of the amendments to the Employment and Industrial Areas Map made pursuant to this section during the preceding year. The report shall include any recommendations the COO deems appropriate on measures the Council might take to address the effects.

(Ordinance 07-1137A, Sec. 2. Ordinance 10-1244B, Sec. 3. Ordinance 11-1264B, Sec. 1.)

Title 4 Employment and Industrial Areas Map as of October 29, 2014

(Ordinance 14-1336.)

Title 4, Industrial and Other Employment Areas

October 2014

0 1 2 4 miles

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- Employment areas
- Industrial areas
- Regionally significant industrial areas
- Proposed main roadway routes
- Proposed road connectors
- Mainline freight
- Branch line freight
- Rail yards
- County boundaries
- Urban growth boundaries
- Neighbor cities

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Table 3.07-4

Clackamas County unincorporated
- Commercial
- Commercial Industrial

Lake Oswego
- General Commercial
- Highway Commercial

Troutdale
- General Commercial

Hillsboro
- General Commercial

Sherwood
- General Commercial

Tigard
- General Commercial
- Commercial Professional

Tualatin
- Commercial General

Wilsonville
- Planned Development Commercial

(Ordinance 97-715B, Sec. 1. Ordinance 02-969B, Sec. 5. Ordinance 10-1244B, Sec. 3.)

Title 5: Neighbor Cities

Title 5 is repealed.

(Ordinance 97-715B, Sec. 1. Ordinance 10-1238A, Sec. 4.)

Title 6: Centers, Corridors, Station Communities and Main Streets

3.07.610 Purpose

The Regional Framework Plan identifies Centers, Corridors, Main Streets and Station Communities throughout the region and recognizes them as the principal centers of urban life in the region. Title 6 calls for actions and investments by cities and counties, complemented by regional investments, to enhance this role. A regional investment is an investment in a new high-capacity transit line or designated a regional investment in a grant or funding program administered by Metro or subject to Metro's approval.

(Ordinance 97-715B, Sec. 1. Ordinance 98-721A, Sec. 1. Ordinance 02-969B, Sec. 7. Ordinance 10-1244B, Sec. 5.)

3.07.620 Actions and Investments in Centers, Corridors, Station Communities and Main Streets

(a) In order to be eligible for a regional investment in a Center, Corridor, Station Community or Main Street, or a portion thereof, a city or county shall take the following actions:

(1) Establish a boundary for the Center, Corridor, Station Community or Main Street, or portion thereof, pursuant to subsection (b);

(2) Perform an assessment of the Center, Corridor, Station Community or Main Street, or portion thereof, pursuant to subsection (c); and

(3) Adopt a plan of actions and investments to enhance the Center, Corridor, Station Community or Main Street, or portion thereof, pursuant to sub(d).

(b) The boundary of a Center, Corridor, Station Community or Main Street, or portion thereof, shall:

(1) Be consistent with the general location shown in the RFP except, for a proposed new Station Community, be consistent with Metro's land use final order for a light rail transit project;

(2) For a Corridor with existing high-capacity transit service, include at least those segments of the Corridor that pass through a Regional Center or Town Center;

(3) For a Corridor designated for future high-capacity transit in the RTP, include the area identified during the system expansion planning process in the RTP; and

(4) Be adopted and may be revised by the city council or county board following notice of the proposed boundary action to the Oregon Department of Transportation and to Metro in the manner set forth in subsection (a) of section 3.07.820 of this chapter.

(c) An assessment of a Center, Corridor, Station Community or Main Street, or portion thereof, shall analyze the following:

(1) Physical and market conditions in the area;

(2) Physical and regulatory barriers to mixed-use, pedestrian-friendly and transit-supportive development in the area;

(3) The city or county development code that applies to the area to determine how the code might be revised to encourage mixed-use, pedestrian-friendly and transit-supportive development;

(4) Existing and potential incentives to encourage mixed-use pedestrian-friendly and transit-supportive development in the area; and

(5) For Corridors and Station Communities in areas shown as Industrial Area or Regionally Significant Industrial Area under Title 4 of this chapter, barriers to a mix and intensity of uses sufficient to support public transportation at the level prescribed in the RTP.

(d) A plan of actions and investments to enhance the Center, Corridor, Station Community or Main Street shall consider the assessment completed under subsection (c) and include at least the following elements:

(1) Actions to eliminate, overcome or reduce regulatory and other barriers to mixed-use, pedestrian-friendly and transit-supportive development;

(2) Revisions to its comprehensive plan and land use regulations, if necessary, to allow:

(A) In Regional Centers, Town Centers, Station Communities and Main Streets, the mix and

intensity of uses specified in section 3.07.640; and

(B) In Corridors and those Station Communities in areas shown as Industrial Area or Regionally Significant Industrial Area in Title 4 of this chapter, a mix and intensity of uses sufficient to support public transportation at the level prescribed in the RTP;

(3) Public investments and incentives to support mixed-use pedestrian-friendly and transit-supportive development; and

(4) A plan to achieve the non-SOV mode share targets, adopted by the city or county pursuant to subsections 3.08.230(a) and (b) of the RTFP, that includes:

(A) The transportation system designs for streets, transit, bicycles and pedestrians consistent with Title 1 of the RTFP;

(B) A transportation system or demand management plan consistent with section 3.08.160 of the RTFP; and

(C) A parking management program for the Center, Corridor, Station Community or Main Street, or portion thereof, consistent with section 3.08.410 of the RTFP.

(e) A city or county that has completed all or some of the requirements of subsections (b), (c), and (d) may seek recognition of that compliance from Metro by written request to the COO.

(f) Compliance with the requirements of this section is not a prerequisite to:

(1) Investments in Centers, Corridors, Station Communities or Main Streets that are not regional investments; or

(2) Investments in areas other than Centers, Corridors, Station Communities and Main Streets.

(Ordinance 97-715B, Sec. 1. Ordinance 98-721A, Sec. 1. Ordinance 02-969B, Sec. 7. Ordinance 10-1244B, Sec. 5.)

3.07.630 Eligibility Actions for Lower Mobility Standards and Trip Generation Rates

(a) A city or county is eligible to use the higher volume-to-capacity standards in Table 7 of the 1999 Oregon Highway Plan when considering an amendment to its comprehensive plan or land use regulations in a Center, Corridor, Station Community or Main Street, or portion thereof, if it has taken the following actions:

(1) Established a boundary pursuant to subsection (b) of section 3.07.620; and

(2) Adopted land use regulations to allow the mix and intensity of uses specified in section 3.07.640.

(b) A city or county is eligible for an automatic reduction of 30 percent below the vehicular trip generation rates reported by the Institute of Traffic Engineers when analyzing the traffic impacts, pursuant to OAR 660-012-0060, of a plan amendment in a Center, Corridor, Main Street or Station Community, or portion thereof, if it has taken the following actions:

(1) Established a boundary pursuant to subsection (b) of section 3.07.620;

(2) Revised its comprehensive plan and land use regulations, if necessary, to allow the mix and intensity of uses specified in section 3.07.640 and to prohibit new auto-dependent uses that rely principally on auto trips, such as gas stations, car washes and auto sales lots; and

(3) Adopted a plan to achieve the non-SOV mode share targets adopted by the city or county pursuant to subsections 3.08.230 (a) and (b)of the RTFP, that includes:

(A) Transportation system designs for streets, transit, bicycles and pedestrians consistent with Title 1 of the RTFP;

(B) A transportation system or demand management plan consistent with section 3.08.160 of the RTFP; and

(C) A parking management program for the Center, Corridor, Station Community or Main Street, or portion thereof, consistent with section 3.08.410 of the RTFP.

(Ordinance 97-715B, Sec. 1. Ordinance 98-721A, Sec. 1. Ordinance 02-969B, Sec. 7. Ordinance 10-1244B, Sec. 5.)

3.07.640 Activity Levels for Centers, Corridors, Station Communities and Main Streets

(a) A Centers, Corridors, Station Communities and Main Streets need a critical number of residents and workers to be vibrant and successful. The following average number of residents and workers per acre is recommended for each:

(1) Central City - 250 persons

(2) Regional Centers - 60 persons

(3) Station Communities - 45 persons

(4) Corridors - 45 persons

(5) Town Centers - 40 persons

(6) Main Streets - 39 persons

(b) Centers, Corridors, Station Communities and Main Streets need a mix of uses to be vibrant and walkable. The following mix of uses is recommended for each:

(1) The amenities identified in the most current version of the *State of the Centers: Investing in Our Communities*, such as grocery stores and restaurants;

(2) Institutional uses, including schools, colleges, universities, hospitals, medical offices and facilities;

(3) Civic uses, including government offices open to and serving the general public, libraries, city halls and public spaces.

(c) Centers, Corridors, Station Communities and Main Streets need a mix of housings types to be vibrant and successful. The following mix of housing types is recommended for each:

(1) The types of housing listed in the "needed housing" statute, ORS 197.303(1);

(2) The types of housing identified in the city's or county's housing need analysis done pursuant to ORS 197.296 or statewide planning Goal 10 (Housing); and

(3) Accessory dwellings pursuant to section 3.07.120 of this chapter.

(Ordinance 97-715B, Sec. 1. Ordinance 98-721A, Sec. 1. Ordinance 02-969B, Sec. 7. Ordinance 10-1244B, Sec. 5. Ordinance 15-1357.)

3.07.650 Centers, Corridors, Station Communities and Main Streets Map

(a) The Centers, Corridors, Station Communities and Main Streets Map is incorporated in this title and is Metro's official depiction of their boundaries. The map shows the boundaries established pursuant to this title.

(b) A city or county may revise the boundary of a Center, Corridor, Station Community or Main Street so long as the boundary is consistent with the general location on the 2040 Growth Concept Map in the RFP. The city or county shall provide notice of its proposed revision as prescribed in subsection (b) of section 3.07.620.

(c) The COO shall revise the Centers, Corridors, Station Communities and Main Streets Map by order to conform the map to establishment or revision of a boundary under this title.

(Ordinance 02-969B, Sec. 7; Ordinance 10-1244B, Sec. 5; Ordinance 11-1264B, Sec. 1.)

Title 6 Centers, Corridors, Station Communities and Main Streets Map as of October 29, 2014

(Ordinance 14-1336.)

Title 6, Centers, Corridors, Station Communities and Main Streets, Adopted Boundaries

October 2014

0 1 2 4 miles

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- Central city, adopted boundary
- Regional center, adopted boundary
- Town center, adopted boundary
- Regional center, conceptual boundary
- Town center, conceptual boundary
- Station communities, adopted boundary
- Station communities, conceptual boundary
- County boundaries
- Urban growth boundaries
- Neighbor cities

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Title 7: Housing Choice

3.07.710 Intent

The Regional Framework Plan calls for establishment of voluntary affordable housing production goals to be adopted by local governments and assistance from local governments on reports on progress towards increasing the supply of affordable housing. It is the intent of Title 7 to implement these policies of the Regional Framework Plan.

(Ordinance 97-715B, Sec. 1. Ordinance 00-882C, Sec. 2. Ordinance 06-1129B, Sec. 2.)

3.07.720 Voluntary Affordable Housing Production Goals

Each city and county within the Metro region should adopt the Affordable Housing Production Goal indicated in Table 3.07-7, as amended over time, as a guide to measure progress toward increasing housing choices and meeting the affordable housing needs of households with incomes between 0 percent and 50 percent of the regional median family income.

(Ordinance 97-715B, Sec. 1. Ordinance 00-882C, Sec.2. Ordinance 03-1005A. Ordinance 06-1129B, Sec. 2.)

3.07.730 Requirements for Comprehensive Plan and Implementing Ordinance Changes

Cities and counties within the Metro region shall ensure that their comprehensive plans and implementing ordinances:

(a) Include strategies to ensure a diverse range of housing types within their jurisdictional boundaries.

(b) Include in their plans actions and implementation measures designed to maintain the existing supply of affordable housing as well as increase the opportunities for new dispersed affordable housing within their boundaries.

(c) Include plan policies, actions, and implementation measures aimed at increasing opportunities for households of all income levels to live within their individual jurisdictions in affordable housing.

(Ordinance 97-715B, Sec. 1. Ordinance 00-882, Sec. 2. Ordinance 03-1005A, Sec. 1. Ordinance 06-1129B, Sec. 2.)

3.07.740 Inventory and Progress Reports on Housing Supply

(a) Local governments shall assist Metro in the preparation of a biennial affordable housing inventory by fulfilling the reporting requirements in subsection (b) of this section.

(b) Local governments shall report their progress on increasing the supply of affordable housing to Metro on a form provided by Metro, to be included as part of the biennial housing inventory described in subsection (a). Local governments shall submit their first progress reports on July 31, 2007, and by April 15 every two years following that date. Progress reports shall include, at least, the following information:

(1) The number and types of units of affordable housing preserved and income groups served during the reporting period, as defined in Metro's form;

(2) The number and types of units of affordable housing built and income groups served during the reporting period;

(3) Affordable housing built and preserved in Centers and Corridors; and

(4) City or county resources committed to the development of affordable housing, such as fee waivers and property tax exemptions.

(Ordinance 00-882C, Sec. 2. Ordinance 03-005A, Sec. 1. Ordinance 06-1129B, Sec. 2. Ordinance 15-1357.)

3.07.750 Technical Assistance

Cities and counties are encouraged to take advantage of the programs of technical and financial assistance provided by Metro to help achieve the goal of increased production and preservation of housing choices and affordable housing and to help fulfill the monitoring and reporting requirements of this title.

(Ordinance 00-882C, Sec. 2. Ordinance 03-1005A, Sec. 1. Ordinance 06-1129B, Sec. 2.)

3.07.760 Recommendations to Implement Other Affordable Housing Strategies

(Repealed, Ordinance 06-1129B, Sec. 2.)

Table 3.07-7

Five-Year Voluntary Affordable Housing Production Goals

(Section 3.07.720)

Jurisdiction	**2001-2006 Affordable Housing Production Goals**		
	Needed new housing units for households earning less than 30% of median household income	*Needed new housing units for households earning 30-50% of median household income*	*Total*
Beaverton	**427**	**229**	**656**
Cornelius	**40**	**10**	**50**
Durham	**6**	**4**	**10**
Fairview	**42**	**31**	**73**
Forest Grove	**55**	**10**	**65**
Gladstone	**43**	**10**	**53**
Gresham	**454**	**102**	**556**
Happy Valley	**29**	**28**	**57**
Hillsboro	**302**	**211**	**513**
Johnson City	**0**	**0**	**0**
King City	**5**	**0**	**5**
Lake Oswego	**185**	**154**	**339**
Maywood Park	**0**	**0**	**0**
Milwaukie	**102**	**0**	**102**
Oregon City	**123**	**35**	**158**
Portland	**1,791**	**0**	**1,791**
Rivergrove	**1**	**1**	**2**
Sherwood	**67**	**56**	**123**
Tigard	**216**	**103**	**319**
Troutdale	**75**	**56**	**131**
Tualatin	**120**	**69**	**189**
West Linn	**98**	**71**	**169**
Wilsonville	**100**	**80**	**180**
Wood Village	**16**	**1**	**17**

Jurisdiction	2001-2006 Affordable Housing Production Goals		
	Needed new housing units for households earning less than 30% of median household income	*Needed new housing units for households earning 30-50% of median household income*	*Total*
Clackamas County, Urban, Unincorporated	**729**	**374**	**1,103**
Multnomah County, Urban, Unincorporated*	**81**	**53**	**134**
Washington County, Urban Unincorporated	**1,312**	**940**	**2,252**
Total	**6,419**	**2,628**	**9,047**

* Strategies and implementation measures addressing these housing goals are in the Progress Reports of the Cities of Portland, Gresham and Troutdale.

(Ordinance 00-882C, Sec. 2.)

Title 8: Compliance Procedures

3.07.810 Compliance With the Functional Plan

(a) The purposes of this chapter are to establish a process for ensuring city or county compliance with requirements of the Urban Growth Management Functional Plan and for evaluating and informing the region about the effectiveness of those requirements. Where the terms "compliance" and "comply" appear in this title, the terms shall have the meaning given to "substantial compliance" in section 3.07.1010.

(b) Cities and counties shall amend their comprehensive plans and land use regulations to comply with the functional plan, or an amendment to the functional plan, within two years after acknowledgement of the functional plan or amendment, or after any later date specified by the Metro Council in the ordinance adopting or amending the functional plan. The COO shall notify cities and counties of the acknowledgment date and compliance dates described in subsections (c) and (d).

(c) After one year following acknowledgment of a functional plan requirement, cities and counties that amend their comprehensive plans and land use regulations shall make such amendments in compliance with the new functional plan requirement.

(d) Cities and counties whose comprehensive plans and land use regulations do not yet comply with the new functional plan requirement shall, after one year following acknowledgment of the requirement, make land use decisions consistent with the requirement. The COO shall notify cities and counties of the date upon which functional plan requirements become applicable to land use decisions at least 120 days before that date. For the purposes of this subsection, "land use decision" shall have the meaning of that term as defined in ORS 197.015(10).

(e) An amendment to a city or county comprehensive plan or land use regulation shall be deemed to comply with the functional plan upon the expiration of the appropriate appeal period specified in ORS 197.830 or 197.650 or, if an appeal is made, upon the final decision on appeal. Once the amendment is deemed to comply, the functional plan requirement shall no longer apply to land use decisions made in conformance with the amendment.

(f) An amendment to a city or county comprehensive plan or land use regulation shall be deemed to comply with the functional plan as provided in subsection (e) only if the city or county provided notice to the COO as required by subsection (a) of section 3.07.820.

(Ordinance 97-715B, Sec. 1. Ordinance 98-730C, Sec. 4. Ordinance 00-839, Sec. 1. Ordinance 00-882C, Sec. 2. Ordinance 01-925E, Sec. 1. Ordinance 02-972A, Sec. 1. Ordinance 05-1077C, Sec. 6. Ordinance 10-1244B, Sec. 7.)

3.07.820 Review by the Chief Operating Officer

(a) A city or county proposing an amendment to a comprehensive plan or land use regulation shall submit the proposed amendment to the COO at least 35 days prior to the first evidentiary hearing on the amendment. The COO may request, and if so the city or county shall submit, an analysis of compliance of the amendment with the functional plan. If the COO submits comments on the proposed amendment to the city or county, the comment shall include analysis and conclusions on compliance and a recommendation with specific revisions to the proposed amendment, if any, that would bring it into compliance with the functional plan. The COO shall send a copy of comment to those persons who have requested a copy.

(b) If the COO concludes that the proposed amendment does not comply with the functional plan, the COO shall advise the city or county that it may:

(1) Revise the proposed amendment as recommended in the COO's analysis;

(2) Seek an extension of time, pursuant to section 3.07.830, to bring the proposed amendment into compliance with the functional plan; or

(3) Seek an exception pursuant to section 3.07.840.

(Ordinance 97-715B, Sec. 1. Ordinance 98-730C, Secs. 5, 6, 7. Ordinance 98-727C, Sec. 1. Ordinance 00-839, Sec. 1. Ordinance 00-882C, Sec. 2. Ordinance 01-925E, Sec. 1. Ordinance 02-972A, Sec. 1. Ordinance 10-1244B, Sec. 7. Ordinance 15-1357.)

3.07.830 Extension of Compliance Deadline

(a) A city or county may seek an extension of time for compliance with a functional plan requirement. The city or county shall file an application for an extension on a form provided by the COO. Upon receipt of an application, the COO shall notify the city or county and

those persons who request notification of applications for extensions. Any person may file a written comment in support of or opposition to the extension.

(b) The COO may grant an extension if the city or county is making progress toward compliance or there is good cause for failure to meet the deadline for compliance. Within 30 days after the filing of a complete application for an extension, the COO shall issue an order granting or denying the extension. The COO shall not grant more than two extensions of time. The COO shall send the order to the city or county and any person who filed a written comment.

(c) The COO may establish terms and conditions for the extension in order to ensure that compliance is achieved in a timely and orderly fashion and that land use decisions made by the city or county during the extension do not undermine the ability of the city or county to achieve the purposes of the functional plan requirement. A term or condition must relate to the requirement of the functional plan to which the COO has granted the extension.

(d) The city or county applicant or any person who filed written comment on the extension may appeal the COO's order to the Metro Council within 15 days after receipt of the order. If an appeal is filed, the Council shall hold a hearing to consider the appeal. After the hearing, the Council shall issue an order granting or denying the extension and shall send copies to the applicant and any person who participated in the hearing. The city or county or a person who participated in the proceeding may seek review of the Council's order as a land use decision described in ORS 197.015(10)(a)(A).

(Ordinance 97-715B, Sec. 1. Ordinance 98-727C, Sec. 2; Ordinance 01-925E, Sec. 1. Ordinance 02-972A, Sec. 1. Ordinance 10-1244B, Sec. 7.)

3.07.840 Exception from Compliance

(a) A city or county may seek an exception from compliance with a functional plan requirement by filing an application on a form provided by the COO. Upon receipt of an application, the COO shall notify the city or county and those persons who request notification of requests for exceptions. Any person may file a written comment in support of or opposition to the exception.

(b) Except as provided in subsection (c), the COO may grant an exception if:

(1) It is not possible to achieve the requirement due to topographic or other physical constraints or an existing development pattern;

(2) This exception and likely similar exceptions will not render the objective of the requirement unachievable region-wide;

(3) The exception will not reduce the ability of another city or county to comply with the requirement; and

(4) The city or county has adopted other measures more appropriate for the city or county to achieve the intended result of the requirement.

(c) The COO may grant an exception to the housing capacity requirements in section 3.07.120 if:

(1) The city or county has completed the analysis of capacity for dwelling units required by section 3.07.120;

(2) It is not possible to comply with the requirements due to topographic or other physical constraints, an existing development pattern, or protection of natural resources pursuant to Titles 3 or 13 of this chapter; and

(3) This exception and other similar exceptions will not render the targets unachievable region-wide.

(d) The COO may establish terms and conditions for the exception in order to ensure that it does not undermine the ability of the region to achieve the purposes of the requirement. A term or condition must relate to the requirement of the functional plan to which the COO grants the exception. The COO shall incorporate the terms and conditions into the order on the exception.

(e) The city or county applicant or a person who filed a written comment on the exception may appeal the COO's order to the Metro Council within 15 days after receipt of the order. If an appeal is filed, the Council shall hold a hearing to consider the appeal. After the hearing, the Council shall issue an order granting or denying the exception and send copies to the applicant and any person who participated in the hearing. The city or county or a person who participated in the proceeding

may seek review of the Council's order as a land use decision described in ORS 197.015(10)(a)(A).

(Ordinance 97-715B, Sec. 1. Ordinance 01-925E, Sec. 1. Ordinance 02-972A, Sec. 1; and Ordinance 10-1244B, Sec. 7.)

3.07.850 Enforcement of Functional Plan

(a) The Metro Council may initiate enforcement if a city or county has failed to meet a deadline for compliance with a functional plan requirement or if the Council has good cause to believe that a city or county is engaged in a pattern or a practice of decision-making that is inconsistent with the functional plan, ordinances adopted by the city or county to implement the plan, or the terms or conditions in an extension or an exception granted pursuant to section 3.07.830 or 3.07.840, respectively. The Council may consider whether to initiate enforcement proceedings upon the request of the COO or a Councilor. The Council shall consult with the city or county before it determines there is good cause to proceed to a hearing under subsection (b).

(b) If the Council decides there is good cause, the Council President shall set the matter for a public hearing before the Council within 90 days of its decision. The COO shall publish notice of the hearing in a newspaper of general circulation in the city or county and send notice to the city or county, MPAC and any person who requests a copy of such notices.

(c) The COO shall prepare a report and recommendation on the pattern or practice, with a proposed order, for consideration by the Council. The COO shall publish the report at least 14 days prior to the public hearing and send a copy to the city or county and any person who requests a copy.

(d) At the conclusion of the hearing, the Council shall adopt an order that dismisses the matter if it decides the city or county complies with the requirement. If the Council decides the city or county has failed to meet a deadline for compliance with a functional plan requirement or has engaged in a pattern or a practice of decision-making that is inconsistent with the functional plan, ordinances adopted by the city or county to implement the plan, or terms or conditions of an extension or an exception granted pursuant to section 3.07.830 or 3.07.840, respectively, the Council may adopt an order that:

(1) Directs changes in the city or county ordinances necessary to remedy the pattern or practice; or

(2) Includes a remedy authorized in ORS 268.390(7).

(e) The Council shall issue its order not later than 30 days following the hearing and send copies to the city or county, MPAC and any person who requests a copy.

(Ordinance 97-715B, Sec. 1. Ordinance 01-925E, Sec. 1. Ordinance 02-972A, Sec. 1. Ordinance 10-1244B, Sec. 7.)

3.07.860 Citizen Involvement in Compliance Review

(a) Any person may contact Metro staff or the COO or appear before the Metro Council to raise issues regarding local functional plan compliance, to request Metro participation in the local process, or to request the COO to appeal a local enactment for which notice is required pursuant to subsection (a) of section 3.07.820. Such contact may be oral or in writing and may be made at any time.

(b) In addition to considering requests as described in (a) above, the Council shall at every regularly scheduled meeting provide an opportunity for people to address the Council on any matter related to this functional plan. The COO shall maintain a list of persons who request notice in writing of COO reviews, reports and orders and proposed actions under this chapter and shall send requested documents as provided in this chapter.

(c) Cities, counties and the Council shall comply with their own adopted and acknowledged Citizen Involvement Requirements (Citizen Involvement) in all decisions, determinations and actions taken to implement and comply with this functional plan. The COO shall publish a citizen involvement fact sheet, after consultation with the Metro Public Engagement Review Committee (PERC), that describes opportunities for citizen involvement in Metro's growth management procedures as well as the implementation and enforcement of this functional plan.

(Ordinance 97-715B, Sec. 1. Ordinance 01-925E, Sec. 1. Ordinance 02-972A, Sec. 1. Ordinance 10-1244B, Sec. 7. Ordinance 15-1357.)

3.07.870 Compliance Report

(a) The COO shall submit a report to the Metro Council by March 1 of each calendar year on the status of compliance by cities and counties with the requirements of the Urban Growth Management Functional Plan. The COO shall send a copy of the report to MPAC, JPACT, PERC and each city and county within Metro.

(b) A city, county or person who disagrees with a determination in the compliance report may seek review of the determination by the Council by written request to the COO. The Council shall notify the requestor, all cities and counties, MPAC, JPACT, PERC, the Department of Land Conservation and Development and any person who requests notification of the review. The notification shall state that the Council does not have jurisdiction to:

(1) Determine whether previous amendments of comprehensive plans or land use regulations made by a city or county comply with functional plan requirements if those amendments already comply pursuant to subsections (e) and (f) of section 3.07.810; or

(2) Reconsider a determination in a prior order issued under this section that a city or county complies with a requirement of the functional plan.

(c) Following its review at a public hearing, the Council shall adopt an order that determines whether the city or county complies with the functional plan requirement raised in the request. The order shall be based upon the COO's report and testimony received at the public hearing. The COO shall send a copy of the order to cities and counties and any person who testifies, orally or in writing, at the public hearing.

(d) A city or county or a person who participated, orally or in writing, at the public hearing, may seek review of the Council's order as a land use decision described in ORS 197.015(10)(a)(A).

(Ordinance 01-925E, Sec. 2. Ordinance 02-972A, Sec. 1. Ordinance 10-1244B, Sec. 7. Ordinance 15-1357.)

Title 9: Performance Measures

Title 9 is repealed.

(Ordinance 10-1244B, Sec. 8.)

TITLE 10: FUNCTIONAL PLAN DEFINITIONS

3.07.1010 Definitions

For the purpose of this functional plan, the following definitions shall apply:

(a) "Balanced cut and fill" means no net increase in fill within the floodplain.

(b) "COO" means Metro's Chief Operating Officer.

(c) "Comprehensive plan" means the all inclusive, generalized, coordinated land use map and policy statement of cities and counties defined in ORS 197.015(5).

(d) "DBH" means the diameter of a tree measured at breast height.

(e) "Design flood elevation" means the elevation of the 100-year storm as defined in FEMA Flood Insurance Studies or, in areas without FEMA floodplains, the elevation of the 25-year storm, or the edge of mapped flood prone soils or similar methodologies.

(f) "Design type" means the conceptual areas described in the Metro 2040 Growth Concept text and map in Metro's regional goals and objectives, including central city, regional centers, town centers, station communities, corridors, main streets, neighborhoods, industrial areas, and employment areas.

(g) "Designated beneficial water uses" means the same as the term as defined by the Oregon Department of Water Resources, which is: an instream public use of water for the benefit of an appropriator for a purpose consistent with the laws and the economic and general welfare of the people of the state and includes, but is not limited to, domestic, fish life, industrial, irrigation, mining, municipal, pollution abatement, power development, recreation, stockwater and wildlife uses.

(h) "Development" means any man-made change defined as buildings or other structures, mining, dredging, paving, filling, or grading in amounts greater than ten (10) cubic yards on any lot or excavation. In addition, any other activity that results in the removal of more than 10 percent of the vegetation in the Water Quality Resource Area on the lot is defined as development, for the purpose of Title 3 except that less than 10 percent removal of vegetation on a lot must comply with section

3.07.340(c) - Erosion and Sediment Control. In addition, any other activity that results in the removal of more than either 10 percent or 20,000 square feet of the vegetation in the Habitat Conservation Areas on the lot is defined as development, for the purpose of Title 13. Development does not include the following: (1)Stream enhancement or restoration projects approved by cities and counties; (2)Farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of Titles 3 and 13 of this functional plan; and (3) Construction on lots in subdivisions meeting the criteria of ORS 92.040(2).

(i) "Development application" means an application for a land use decision, limited land decision including expedited land divisions, but excluding partitions as defined in ORS 92.010(7) and ministerial decisions such as a building permit.

(j) "Division" means a partition or a subdivision as those terms are defined in ORS chapter 92.

(k) "Ecological functions" means the biological and hydrologic characteristics of healthy fish and wildlife habitat. Riparian ecological functions include microclimate and shade, streamflow moderation and water storage, bank stabilization and sediment/pollution control, sources of large woody debris and natural channel dynamics, and organic material sources. Upland wildlife ecological functions include size of habitat area, amount of habitat with interior conditions, connectivity of habitat to water resources, connectivity to other habitat areas, and presence of unique habitat types.

(l) "Emergency" means any man-made or natural event or circumstance causing or threatening loss of life, injury to person or property, and includes, but is not limited to, fire, explosion, flood, severe weather, drought earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

(m) "Enhancement" means the process of improving upon the natural functions and/or values of an area or feature which has been degraded by human activity. Enhancement activities may or may not return the site to a pre-disturbance condition, but create/recreate processes and features that occur naturally.

(n) "Fill" means any material such as, but not limited to, sand, gravel, soil, rock or gravel that is placed in a wetland or floodplain for the purposes of development or redevelopment.

(o) "Flood Areas" means those areas contained within the 100-year floodplain and floodway as shown on the Federal Emergency Management Agency Flood Insurance Maps and all lands that were inundated in the February 1996 flood.

(p) "Flood Management Areas" means all lands contained within the 100-year floodplain, flood area and floodway as shown on the Federal Emergency Management Agency Flood Insurance Maps and the area of inundation for the February 1996 flood. In addition, all lands which have documented evidence of flooding.

(q) "Floodplain" means land subject to periodic flooding, including the 100-year floodplain as mapped by FEMA Flood Insurance Studies or other substantial evidence of actual flood events.

(r) "Growth Concept Map" means the conceptual map demonstrating the 2040 Growth Concept design types attached to this plan[1].

(s) "Habitat Conservation Area" or "HCA" means an area identified on the Habitat Conservation Areas Map and subject to the performance standards and best management practices described in Metro Code section 3.07.1340.

(t) "Habitat-friendly development" means a method of developing property that has less detrimental impact on fish and wildlife habitat than does traditional development methods. Examples include clustering development to avoid habitat, using alternative materials and designs such as pier, post, or piling foundations designed to minimize tree root disturbance, managing storm water on-site to help filter rainwater and recharge groundwater sources, collecting rooftop water in rain barrels for reuse in site landscaping and gardening, and reducing the amount of effective impervious surface created by development.

(u) "Habitats of Concern" means the following unique or unusually important wildlife habitat areas as identified based on cite specific information provided by local wildlife or habitat experts: Oregon white oak woodlands, bottomland hardwood forests, wetlands, native

[1] On file in the Metro Council office.

grasslands, riverine islands or deltas, and important wildlife migration corridors.

(v) "Hazardous materials" means materials described as hazardous by Oregon Department of Environmental Quality.

(w) "Implementing ordinances or regulations" means any city or county land use regulation as defined by ORS 197.015(11) which includes zoning, land division or other ordinances which establish standards for implementing a comprehensive plan.

(x) "Invasive non-native or noxious vegetation" means plants listed as nuisance plants or prohibited plants on the Metro Native Plant List as adopted by Metro Council resolution because they are plant species that have been introduced and, due to aggressive growth patterns and lack of natural enemies in the area where introduced, spread rapidly into native plant communities.

(y) "Land Conservation and Development Commission" or "LCDC" means the Oregon Land Conservation and Development Commission.

(z) "Land use regulation" means any local government zoning ordinance, land division ordinance adopted under ORS 92.044 or 92.046 or similar general ordinance establishing standards for implementing a comprehensive plan, as defined in ORS 197.015.

(aa) "Large-format retail commercial buildings" means a building intended for retail commercial use with more than 60,000 square feet of gross leasable area, or that amount or more of retail sales area on a single lot or parcel, or that amount or more on contiguous lots or parcels including lots or parcels separated only by a transportation right-of-way.

(bb) "Local program effective date" means the effective date of a city's or county's new or amended comprehensive plan and implementing ordinances adopted to comply with Title 13 of the Urban Growth Management Functional Plan, Metro Code sections 3.07.1310 to 3.07.1370. If a city or county is found to be in substantial compliance with Title 13 without making any amendments to its comprehensive plan or land use regulations, then the local program effective date shall be December 28, 2005. If a city or county amends its comprehensive plan or land use regulations to comply with Title 13, then the local program effective date shall be the effective date of the city's or county's amendments to its

comprehensive plan or land use regulations, but in no event shall the local program effective date be later than two years after Title 13 is acknowledged by LCDC. For territory brought within the Metro UGB after December 28, 2005, the local program effective date shall be the effective date of the ordinance adopted by the Metro Council to bring such territory within the Metro UGB.

(cc) "Metro" means the regional government of the metropolitan area, the elected Metro Council as the policy setting body of the government.

(dd) "Metro boundary" means the jurisdictional boundary of Metro, the elected regional government of the metropolitan area.

(ee) "MPAC" means the Metropolitan Advisory Committee established pursuant to Metro Charter, Chapter V, Section 27.

(ff) "Mitigation" means the reduction of adverse effects of a proposed project by considering, in the following order: (1) avoiding the impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (3) rectifying the impact by repairing, rehabilitating or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action by monitoring and taking appropriate measures; and (5) compensating for the impact by replacing or providing comparable substitute water quality resource areas or habitat conservation areas.

(gg) "Mixed use" means comprehensive plan or implementing regulations that permit a mixture of commercial and residential development.

(hh) "Mixed-use development" includes areas of a mix of at least two of the following land uses and includes multiple tenants or ownerships: residential, retail and office. This definition excludes large, single-use land uses such as colleges, hospitals, and business campuses. Minor incidental land uses that are accessory to the primary land use should not result in a development being designated as "mixed-use development." The size and definition of minor incidental, accessory land uses allowed within large, single-use developments should be

determined by cities and counties through their comprehensive plans and implementing ordinances.

(ii) "Native vegetation" or "native plant" means any vegetation listed as a native plant on the Metro Native Plant List as adopted by Metro Council resolution and any other vegetation native to the Portland metropolitan area provided that it is not listed as a nuisance plant or a prohibited plant on the Metro Native Plant List.

(jj) "Net acre" means an area measuring 43.560 square feet which excludes:

- Any developed road rights-of-way through or on the edge of the land; and
- Environmentally constrained areas, including any open water areas, floodplains, natural resource areas protected under statewide planning Goal 5 in the comprehensive plans of cities and counties in the region, slopes in excess of 25 percent and wetlands requiring a Federal fill and removal permit under Section 404 of the Clean Water Act. These excluded areas do not include lands for which the local zoning code provides a density bonus or other mechanism which allows the transfer of the allowable density or use to another area or to development elsewhere on the same site; and
- All publicly-owned land designated for park and open spaces uses.

(kk) "Net developed acre" consists of 43,560 square feet of land, after excluding present and future rights-of-way, school lands and other public uses.

(ll) "Net vacant buildable land" means all vacant land less all land that is: (1) within Water Quality Resource Areas; (2) within Habitat Conservation Areas; (3) publicly owned by a local, state or federal government; (4) burdened by major utility easements; and (5) necessary for the provision of roads, schools, parks, churches, and other public facilities.

(mm) "Perennial streams" means all primary and secondary perennial waterways as mapped by the U.S. Geological Survey.

(nn) "Performance measure" means a measurement derived from technical analysis aimed at determining whether a planning policy is achieving the expected outcome or intent associated with the policy.

(oo) "Person-trips" means the total number of discrete trips by individuals using any mode of travel.

(pp) "Persons per acre" means the intensity of building development by combining residents per acre and employees per acre.

(qq) "Practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose. As used in Title 13 of this functional plan, "practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose and probable impact on ecological functions.

(rr) "Primarily developed" means areas where less than 10% of parcels are either vacant or underdeveloped.

(ss) “Property owner” means a person who owns the primary legal or equitable interest in the property.

"Protected Water Features.” Primary Protected Water Features shall include:

- Title 3 wetlands; and
- Rivers, streams, and drainages downstream from the point at which 100 acres or more are drained to that water feature (regardless of whether it carries year-round flow); and
- Streams carrying year-round flow; and
- Springs which feed streams and wetlands and have year-round flow; and
- Natural lakes.

Secondary Protected Water Features shall include intermittent streams and seeps downstream of the point at which 50 acres are drained and upstream of the point at which 100 acres are drained to that water feature.

(tt) "Public facilities and services" means sewers, water service, stormwater services and transportation.

(uu) "Redevelopable land" means land on which development has already occurred, which due to present or expected market forces, there exists the strong likelihood that existing development will be converted to more intensive uses during the planning period.

(vv) "Regionally significant fish and wildlife habitat" means those areas identified on the Regionally Significant Fish and Wildlife Habitat Inventory Map, adopted in Metro Code section 3.07.1320, as significant natural resource sites.

(ww) "Restoration" means the process of returning a disturbed or altered area or feature to a previously existing natural condition. Restoration activities reestablish the structure, function, and/or diversity to that which occurred prior to impacts caused by human activity.

(xx) "Retail" means activities which include the sale, lease or rent of new or used products to the general public or the provision of product repair or services for consumer and business goods.

(yy) "Riparian area" means the water influenced area adjacent to a river, lake or stream consisting of the area of transition from a hydric ecosystem to a terrestrial ecosystem where the presence of water directly influences the soil-vegetation complex and the soil-vegetation complex directly influences the water body. It can be identified primarily by a combination of geomorphologic and ecologic characteristics.

(zz) "Rural reserve" means an area designated rural reserve by Clackamas, Multnomah or Washington County pursuant to OAR 660 Division 27.

(aaa) "Significant negative impact" means an impact that affects the natural environment, considered individually or cumulatively with other impacts on the Water Quality Resource Area, to the point where existing water quality functions and values are degraded.

(bbb) "Straight-line distance" means the shortest distance measured between two points.

(ccc) "Stream" means a body of running water moving over the earth's surface in a channel or bed, such as a creek, rivulet or river. It flows at least part of the year, including perennial and intermittent streams. Streams are dynamic in nature and their structure is maintained through build-up and loss of sediment.

(ddd) "Substantial compliance" means city and county comprehensive plans and implementing ordinances, on the whole, conforms with the purposes of the performance standards in the functional plan and any failure to meet individual performance standard requirements is technical or minor in nature.

(eee) "Title 3 Wetlands" means wetlands of metropolitan concern as shown on the Metro Water Quality and Flood Management Area Map and other wetlands added to city or county adopted Water Quality and Flood Management Area maps consistent with the criteria in Title 3, section 3.07.340(e)(3). Title 3 wetlands do not include artificially constructed and managed stormwater and water quality treatment facilities.

(fff) "Top of bank" means the same as "bankfull stage" defined in OAR 141-085-0510(5).

(ggg) "Urban development value" means the economic value of a property lot or parcel as determined by analyzing three separate variables: assessed land value, value as a property that could generate jobs ("employment value"), and the Metro 2040 design type designation of property. The urban development value of all properties containing regionally significant fish and wildlife habitat is depicted on the Metro Habitat Urban Development Value Map referenced in Metro Code section 3.07.1340(e).

(hhh) "UGB" means an urban growth boundary adopted pursuant to ORS chapter 197.

(iii) "Underdeveloped parcels" means those parcels of land with less than 10 percent of the net acreage developed with permanent structures.

(jjj) "Urban reserve" means an area designated urban reserve by the Metro Council pursuant to OAR 660 Division 27.

(kkk) "Utility facilities" means buildings, structures or any constructed portion of a system which provides for the production, transmission, conveyance, delivery or furnishing of services including, but not limited to, heat, light, water, power, natural gas, sanitary sewer, stormwater, telephone and cable television.

(lll) "Vacant land" means land identified in the Metro or local government inventory as undeveloped land.

(mmm) "Variance" means a discretionary decision to permit modification of the terms of an implementing ordinance based on a demonstration of unusual hardship or exceptional circumstance unique to a specific property.

(nnn) "Visible or measurable erosion" includes, but is not limited to:

- Deposits of mud, dirt sediment or similar material exceeding one-half cubic foot in volume on public or private streets, adjacent property, or onto the

storm and surface water system, either by direct deposit, dropping discharge, or as a result of the action of erosion.

- Evidence of concentrated flows of water over bare soils; turbid or sediment laden flows; or evidence of on-site erosion such as rivulets on bare soil slopes, where the flow of water is not filtered or captured on the site.
- Earth slides, mudflows, earth sloughing, or other earth movement that leaves the property.

(ooo) "Water feature" means all rivers, streams (regardless of whether they carry year-round flow, i.e., including intermittent streams), springs which feed streams and wetlands and have year-round flow, Flood Management Areas, wetlands, and all other bodies of open water.

(ppp) "Water Quality and Flood Management Area" means an area defined on the Metro Water Quality and Flood Management Area Map, to be attached hereto[2]. These are areas that require regulation in order to mitigate flood hazards and to preserve and enhance water quality. This area has been mapped to generally include the following: stream or river channels, known and mapped wetlands, areas with flood-prone soils adjacent to the stream, floodplains, and sensitive water areas. The sensitive areas are generally defined as 50 feet from top of bank of streams for areas of less than 25 percent slope, and 200 feet from top of bank on either side of the stream for areas greater than 25 percent slope, and 50 feet from the edge of a mapped wetland.

(qqq) "Water Quality Resource Areas" means vegetated corridors and the adjacent water feature as established in Title 3.

(rrr) "Wetlands" mean those areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands are those areas identified and delineated by a qualified wetland specialist as set forth in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland

[2] On file in Metro Council office.

Delineation Manual: Western Mountains, Valleys and Coast Region (Version 2.0), (May 2010).

(sss) "Zoned capacity" means the highest number of dwelling units or jobs that are allowed to be contained in an area by zoning and other city or county jurisdiction regulations.

(Ordinance 97-715B, Sec. 1. Ordinance 98-721A, Sec. 1. Ordinance 98-730C, Sec. 10. Ordinance 00-839, Sec. 1. Ordinance 00-869A, Sec. 2; Ordinance 02-972A, Sec. 1; Ordinance 05-1077C, Sec. 6; Ordinance 10-1244B, Sec. 9. Ordinance 15-1357.)

TITLE 11: PLANNING FOR NEW URBAN AREAS

3.07.1105 Purpose and Intent

The Regional Framework Plan calls for long-range planning to ensure that areas brought into the UGB are urbanized efficiently and become or contribute to mixed-use, walkable, transit-friendly communities. It is the purpose of Title 11 to guide such long-range planning for urban reserves and areas added to the UGB. It is also the purpose of Title 11 to provide interim protection for areas added to the UGB until city or county amendments to land use regulations to allow urbanization become applicable to the areas.

(Ordinance 99-818A, Sec. 3. Ordinance 02-969B, Sec. 11. Ordinance 10-1238A, Sec. 5. Ordinance 11-1252A, Sec. 1.)

3.07.1110 Planning for Areas Designated Urban Reserve

(a) The county responsible for land use planning for an urban reserve and any city likely to provide governance or an urban service for the area, shall, in conjunction with Metro and appropriate service districts, develop a concept plan for the urban reserve prior to its addition to the UGB pursuant to sections 3.07.1420, 3.07.1430 or 3.07.1435 of this chapter. The date for completion of a concept plan and the area of urban reserves to be planned will be jointly determined by Metro and the county and city or cities.

(b) A local government, in creating a concept plan to comply with this section, shall consider actions necessary to achieve the following outcomes:

(1) If the plan proposes a mix of residential and employment uses:

(A) A mix and intensity of uses that will make efficient use of the public systems and facilities described in subsection (c);

(B) A development pattern that supports pedestrian and bicycle travel to retail, professional and civic services;

(C) A range of housing of different types, tenure and prices addressing the housing needs in the prospective UGB expansion area in the context of the housing needs of the governing city, the county, and the region if data on regional housing needs are available, in order to help create economically and socially vital and complete neighborhoods and cities and avoiding the concentration of poverty and the isolation of families and people of modest means;

(D) Sufficient employment opportunities to support a healthy economy, including, for proposed employment areas, lands with characteristics, such as proximity to transportation facilities, needed by employers;

(E) Well-connected systems of streets, bikeways, parks, recreational trails and public transit that link to needed housing so as to reduce the combined cost of housing and transportation;

(F) A well-connected system of parks, natural areas and other public open spaces;

(G) Protection of natural ecological systems and important natural landscape features; and

(H) Avoidance or minimization of adverse effects on farm and forest practices and important natural landscape features on nearby rural lands.

(2) If the plan involves fewer than 100 acres or proposes to accommodate only residential or employment needs, depending on the need to be accommodated:

(A) A range of housing of different types, tenure and prices addressing the housing needs in the prospective UGB expansion area in the context of the housing needs of the governing city, the county, and the region if data on regional

housing needs are available, in order to help create economically and socially vital and complete neighborhoods and cities and avoiding the concentration of poverty and the isolation of families and people of modest means;

(B) Sufficient employment opportunities to support a healthy economy, including, for proposed employment areas, lands with characteristics, such as proximity to transportation facilities, needed by employers;

(C) Well-connected systems of streets, bikeways, pedestrian ways, parks, natural areas, recreation trails;

(D) Protection of natural ecological systems and important natural landscape features; and

(E) Avoidance or minimization of adverse effects on farm and forest practices and important natural landscape features on nearby rural lands.

(c) A concept plan shall:

(1) Show the general locations of any residential, commercial, industrial, institutional and public uses proposed for the area with sufficient detail to allow estimates of the cost of the public systems and facilities described in paragraph (2);

(2) For proposed sewer, park and trail, water and stormwater systems and transportation facilities, provide the following:

(A) The general locations of proposed sewer, park and trail, water and stormwater systems;

(B) The mode, function and general location of any proposed state transportation facilities, arterial facilities, regional transit and trail facilities and freight intermodal facilities;

(C) The proposed connections of these systems and facilities, if any, to existing systems;

(D) Preliminary estimates of the costs of the systems and facilities in sufficient detail to determine feasibility and allow cost comparisons with other areas;

(E) Proposed methods to finance the systems and facilities; and

(F) Consideration for protection of the capacity, function and safe operation of state highway interchanges, including existing and planned interchanges and planned improvements to interchanges.

(3) If the area subject to the concept plan calls for designation of land for industrial use, include an assessment of opportunities to create and protect parcels 50 acres or larger and to cluster uses that benefit from proximity to one another;

(4) If the area subject to the concept plan calls for designation of land for residential use, the concept plan will describe the goals for meeting the housing needs for the concept planning area in the context of the housing needs of the governing city, the county, and the region if data on regional housing needs are available. As part of this statement of objectives, the concept plan shall identify the general number, price and type of market and nonmarket-provided housing. The concept plan shall also identify preliminary strategies, including fee waivers, subsidies, zoning incentives and private and nonprofit partnerships, that will support the likelihood of achieving the outcomes described in subsection (b) of this section;

(5) Show water quality resource areas, flood management areas and habitat conservation areas that will be subject to performance standards under Titles 3 and 13 of this chapter;

(6) Be coordinated with the comprehensive plans and land use regulations that apply to nearby lands already within the UGB;

(7) Include an agreement between or among the county and the city or cities and service districts that preliminarily identifies which city, cities or districts will likely be the providers of urban services, as defined at ORS 195.065(4), when the area is urbanized;

(8) Include an agreement between or among the county and the city or cities that preliminarily identifies the local government responsible for

comprehensive planning of the area, and the city or cities that will have authority to annex the area, or portions of it, following addition to the UGB;

(9) Provide that an area added to the UGB must be annexed to a city prior to, or simultaneously with, application of city land use regulations to the area intended to comply with subsection (c) of section 3.07.1120; and

(10) Be coordinated with schools districts, including coordination of demographic assumptions.

(d) Concept plans shall guide, but not bind:

(1) The designation of 2040 Growth Concept design types by the Metro Council;

(2) Conditions in the Metro ordinance that adds the area to the UGB; or

(3) Amendments to city or county comprehensive plans or land use regulations following addition of the area to the UGB.

(e) If the local governments responsible for completion of a concept plan under this section are unable to reach agreement on a concept plan by the date set under subsection (a), then the Metro Council may nonetheless add the area to the UGB if necessary to fulfill its responsibility under ORS 197.299 to ensure the UGB has sufficient capacity to accommodate forecasted growth.

(Ordinance 98-772B, Sec. 2. Ordinance 99-818A, Sec. 3. Ordinance 02-969B, Sec. 11. Ordinance 06-1110A, Sec. 1. Ordinance 10-1238A, Sec. 5. Ordinance 11-1252A, Sec. 1. Ordinance 15-1357.)

3.07.1120 Planning for Areas Added to the UGB

(a) The county or city responsible for comprehensive planning of an area, as specified by the intergovernmental agreement adopted pursuant to section 3.07.1110(c)(7) or the ordinance that added the area to the UGB, shall adopt comprehensive plan provisions and land use regulations for the area to address the requirements of subsection (c) by the date specified by the ordinance or by section 3.07.1455(b)(4) of this chapter.

(b) If the concept plan developed for the area pursuant to section 3.07.1110 assigns planning responsibility to more than one city or county, the responsible local governments shall provide for concurrent consideration

and adoption of proposed comprehensive plan provisions unless the ordinance adding the area to the UGB provides otherwise.

(c) Comprehensive plan provisions for the area shall include:

(1) Specific plan designation boundaries derived from and generally consistent with the boundaries of design type designations assigned by the Metro Council in the ordinance adding the area to the UGB;

(2) Provision for annexation to a city and to any necessary service districts prior to, or simultaneously with, application of city land use regulations intended to comply with this subsection;

(3) Provisions that ensure zoned capacity for the number and types of housing units, if any, specified by the Metro Council pursuant to section 3.07.1455(b)(2) of this chapter;

(4) Provision for affordable housing consistent with Title 7 of this chapter if the comprehensive plan authorizes housing in any part of the area.

(5) Provision for the amount of land and improvements needed, if any, for public school facilities sufficient to serve the area added to the UGB in coordination with affected school districts. This requirement includes consideration of any school facility plan prepared in accordance with ORS 195.110;

(6) Provision for the amount of land and improvements needed, if any, for public park facilities sufficient to serve the area added to the UGB in coordination with affected park providers.

(7) A conceptual street plan that identifies internal street connections and connections to adjacent urban areas to improve local access and improve the integrity of the regional street system. For areas that allow residential or mixed-use development, the plan shall meet the standards for street connections in the Regional Transportation Functional Plan;

(8) Provision for the financing of local and state public facilities and services; and

(9) A strategy for protection of the capacity and function of state highway interchanges, including existing and planned interchanges and planned improvements to interchanges.

(d) The county or city responsible for comprehensive planning of an area shall submit to Metro a determination of the residential capacity of any area zoned to allow dwelling units, using a method consistent with a Goal 14 analysis, within 30 days after adoption of new land use regulations for the area.

(Ordinance 98-772B, Sec. 2. Ordinance 99-818A, Sec. 3. Ordinance 01-929A, Sec. 8. Ordinance 02-964, Sec. 5. Ordinance 05-1077C, Sec. 6. Ordinance 05-1089A, Sec. 2. Ordinance 07-1137A, Sec. 3. Ordinance 10-1238A, Sec. 5. Ordinance 11-1252A, Sec. 1. Ordinance 15-1357.)

3.07.1130 Interim Protection of Areas Added to the UGB

Until land use regulations that comply with section 3.07.1120 become applicable to the area, the city or county responsible for planning the area added to the UGB shall not adopt or approve:

(a) A land use regulation or zoning map amendment that allows higher residential density in the area than allowed by regulations in effect at the time of addition of the area to the UGB;

(b) A land use regulation or zoning map amendment that allows commercial or industrial uses not allowed under regulations in effect at the time of addition of the area to the UGB;

(c) A land division or partition that would result in creation of a lot or parcel less than 20 acres in size, except for public facilities and services as defined in section 3.07.1010 of this chapter, or for a new public school;

(d) In an area designated by the Metro Council in the ordinance adding the area to the UGB as Regionally Significant Industrial Area:

(1) A commercial use that is not accessory to industrial uses in the area; and

(2) A school, a church, a park or any other institutional or community service use intended to serve people who do not work or reside in the area.

(Ordinance 98-772B, Sec. 2. Ordinance 99-818A, Sec. 3. Ordinance 10-1238A, Sec. 5. Ordinance 11-1252A, Sec. 1.)

Title 12: Protection of Residential Neighborhoods

3.07.1210 Purpose and Intent

Existing neighborhoods are essential to the success of the 2040 Growth Concept. The intent of Title 12 of the Urban Growth Management Functional Plan is to protect the region's residential neighborhoods. The purpose of Title 12 is to help implement the policy of the Regional Framework Plan to protect existing residential neighborhoods from air and water pollution, noise and crime and to provide adequate levels of public services.

(Ordinance 02-969B, Sec. 3.)

3.07.1220 Residential Density

Metro shall not require any city or county to authorize an increase in the residential density of a single-family neighborhood in an area mapped solely as Neighborhood.

(Ordinance 02-969B, Sec. 3. Ordinance 15-1357.)

3.07.1230 Access to Commercial Services

(a) In order to reduce air pollution and traffic congestion, and to make commercial retail services more accessible to residents of Neighborhoods, a city or county may designate in its comprehensive plan and land use regulations one or more Neighborhood Centers within or in close proximity to Neighborhoods to serve as a convenient location of commercial services.

(b) To ensure that commercial development serves the needs of the residents of Neighborhoods but does not generate excessive traffic, noise or air pollution, a city or county that designates a Neighborhood Center shall adopt limitations on the scale of commercial services in Neighborhood Centers. In a Neighborhood Center, a city or county shall not approve:

  (1) A commercial retail use with more than 20,000 square feet of gross leasable area in a single building; or

  (2) Office commercial uses with more than 10,000 square feet of gross leasable area in a single building or on a single lot or parcel.

(Ordinance 02-969B, Sec. 3. Ordinance 15-1357.)

3.07.1240 Access to Parks and Schools

(a) Each city and county shall, within two years following adoption by the Metro Council of a process and criteria for such standards, establish a level of service standard for parks and greenspaces that calls for a park facility within a specified distance of all residences.

(b) To make parks and greenspaces more accessible to residents of Neighborhoods and all residents of the region, each city and county shall provide for access to parks and greenspaces by walking, biking and transit, where transit is available or planned.

(c) To make parks and schools more accessible to neighborhood residents, to reduce traffic, and to use land more efficiently, cities, counties, park providers and school districts shall, where appropriate, provide for shared use of school facilities for park purposes and of park facilities for school purposes.

(d) To make public schools more accessible to neighborhood residents, cities, counties and school districts shall prioritize school sites that are near concentrations of population and are connected to those concentrations by safe and convenient walking, biking and, where transit is available or planned, transit facilities.

(Ordinance 02-969B, Sec. 3. Ordinance 15-1357.)

Title 13: Nature In Neighborhoods

3.07.1310 Intent

The purposes of this program are to (1) conserve, protect, and restore a continuous ecologically viable streamside corridor system, from the streams' headwaters to their confluence with other streams and rivers, and with their floodplains in a manner that is integrated with upland wildlife habitat and with the surrounding urban landscape; and (2) to control and prevent water pollution for the protection of the public health and safety, and to maintain and improve water quality throughout the region. This program:

(a) Will achieve its purpose through conservation, protection, and appropriate restoration of riparian and upland fish and wildlife habitat through time, using a comprehensive approach that includes voluntary, incentive-based, educational, and regulatory elements;

(b) Balances and integrates goals of protecting and enhancing fish and wildlife habitat, building livable Region 2040 communities, supporting a strong economy, controlling and preventing water pollution for the protection of the public health and safety, and complying with federal laws including the Clean Water Act and the Endangered Species Act;

(c) Includes provisions to monitor and evaluate program performance over time to determine whether the program is achieving the program's objectives and targets, to determine whether cities and counties are in substantial compliance with this title, and to provide sufficient information to determine whether to amend or adjust the program in the future; and

(d) Establishes minimum requirements and is not intended to repeal or replace existing requirements of city and county comprehensive plans and implementing ordinances to the extent those requirements already meet the minimum requirements of this title, nor is it intended to prohibit cities and counties from adopting and enforcing fish and wildlife habitat protection and restoration programs that exceed the requirements of this title.

(Ordinance 05-1077C, Sec. 5.)

3.07.1320 Inventory and Habitat Conservation Areas

The purpose of this section is to describe the geographic information system (GIS) data and maps that form the basis of Metro's fish and wildlife habitat protection and restoration program. This data and maps are referenced in various ways in this title, but may or may not be relevant within a city or county depending upon which implementation alternative the city or county chooses pursuant to Metro Code Section 3.07.1330(b). The maps referred to in this title are representations of data contained within Metro's GIS system, operated by the Metro Data Resource Center, and references to such maps shall be interpreted as references to the maps themselves and to the underlying GIS data that the maps represent.

(a) The Regionally Significant Fish and Wildlife Habitat Inventory Map (hereinafter the "Inventory Map"), attached hereto[3], identifies the areas that have been

[3] On file in the Metro Council office and copies available from the Metro Data Resource Center.

determined to contain regionally significant fish and wildlife habitat. The Inventory Map divides habitat into two general categories, riparian and upland wildlife, and further differentiates each habitat category into low, medium, and high value habitats.

(b) The Habitat Conservation Areas Map, attached hereto[4], identifies the areas that are subject to the performance standards and best management practices described in Metro Code Section 3.07.1340, to the extent that a city or county chooses to comply with Metro Code Section 3.07.1330 by using the Habitat Conservation Areas map, or a map that substantially complies with the Habitat Conservation Areas map. For such cities and counties, the Habitat Conservation Areas Map further identifies, subject to the map verification process described in Metro Code Sections 3.07.1330(g) and 3.07.1340(d), which areas will be subject to high, moderate, and low levels of habitat conservation based on Metro Council's consideration of the results of the economic, social, environmental, and energy (ESEE) consequences of protecting or not protecting the habitat, public input, and technical review, and the Metro Council's subsequent decision to balance conflicting uses in habitat areas.

(1) Table 3.07-13a describes how (1) Class I and II riparian habitat areas, and (2) Class A and B upland wildlife habitat areas within publicly-owned parks and open spaces, except for parks and open spaces where the acquiring agency clearly identified that it was acquiring the property to develop it for active recreational uses, located within the Metro boundary on December 28, 2005, were designated as high, moderate, and low Habitat Conservation Areas.

(2) Table 3.07-13b describes how Class I and II riparian habitat areas and Class A and B upland wildlife areas brought within the Metro UGB after December 28, 2005, will be designated as high, moderate, and low Habitat Conservation Areas. Metro Code Section 3.07.1360 describes the procedures for how Table 3.07-13b and Metro Code Section 3.07.1340 shall be applied in such areas.

[4] On file in the Metro Council office and copies available from the Metro Data Resource Center.

(c) Exempt International Marine Terminals

(1) Marine dependent properties which would otherwise have been mapped as Habitat Conservation Areas do not appear on the Habitat Conservation Areas Map because the Metro Council concluded, based on its analysis of the economic, social, environmental, and energy implications of its decision, that the economic importance of such properties far outweighed the environmental importance of the properties as fish and wildlife habitat. The Metro Council applied the criteria described in subsection (c)(2) of this section to conclude that the following properties should not be considered Habitat Conservation Areas:

(A) The International Terminal property, located at 12005 N. Burgard Way, Portland, Oregon, 97203;

(B) Port of Portland Marine Terminal 4;

(C) Port of Portland Marine Terminal 5; and

(D) Port of Portland Marine Terminal 6.

(2) The Metro Council may, at its discretion, consider and adopt ordinances to exempt from the provisions of this title any additional properties along the Willamette and Columbia Rivers, or portions of such properties, where it can be demonstrated that:

(A) The property is currently developed for use as an international marine terminal capable of mooring ocean-going tankers or cargo ships; and

(B) The property is substantially without vegetative cover.

(Ordinance 05-1077C, Sec. 5.)

3.07.1330 Implementation Alternatives for Cities and Counties

(a) Under Oregon law, upon acknowledgment of this program by the Oregon Land Conservation and Development Commission (LCDC), cities and counties wholly or partly within the Metro boundary shall apply the requirements of this title with respect to areas identified as riparian habitat on the Inventory Map and areas identified as upland wildlife habitat on the Inventory Map, according to the compliance deadlines established in Metro Code

Section 3.07.810, rather than applying the requirements of division 23 of chapter 660 of the Oregon Administrative Rules ("OAR"), promulgated by LCDC, except that:

(1) A city or county shall apply the requirements of division 23 of OAR chapter 660 in order to adopt comprehensive plan amendments or land use regulations that (i) would otherwise require compliance with division 23 of OAR chapter 660 but for the adoption of this title (i.e., amendments or regulations adopted to protect Goal 5 resources), and (ii)will limit development in areas not identified as riparian habitat on the Inventory Map, unless such provisions (a) are part of a program intended to comply with Metro Code Section 3.07.1330(b)(3) and apply only to areas identified as upland wildlife habitat on the Inventory Map (i.e., they do not apply to areas not identified as habitat); or (b) apply to areas identified as Class A or B upland wildlife habitat on the Inventory Map that are brought within the UGB after December 28, 2005. Such a city or county shall seek acknowledgement of such provisions from LCDC or treat such provisions as post-acknowledgement plan amendments under ORS chapter 197;

(2) A city or county that, prior to December 28, 2005, adopted any comprehensive plan amendments or land use regulations that (a) apply to areas identified as upland wildlife habitat on the Inventory Map but not identified as riparian habitat on the Inventory Map, (b) limit development in order to protect fish or wildlife habitat, and (c) were adopted in compliance with division 23 of OAR chapter 660, shall not repeal such amendments or regulations, nor shall it amend such provisions in a manner that would allow any more than a de minimis increase in the amount of development that could occur in areas identified as upland wildlife habitat; and

(3) After a city or county has demonstrated that it is in substantial compliance with the requirements of this title, if the city or county wishes to adopt comprehensive plan amendments or land use regulations applicable to areas identified as riparian habitat on the Inventory Map that have the effect of imposing greater limits on development than those imposed by provisions that are in

substantial compliance with the requirements of this title, such a city or county shall comply with the provisions of division 23 of OAR chapter 660, and shall seek acknowledgement of such provisions from LCDC or treat such provisions as post-acknowledgement plan amendments under ORS chapter 197.

(b) Each city and county in the region shall either:

(1) Amend its comprehensive plan and implementing ordinances to adopt the Title 13 Model Ordinance and the Metro Habitat Conservation Areas Map, and demonstrate compliance with the provisions of (a) Metro Code Section 3.07.1340(a)(5), related to enhanced fish and wildlife protection and management of publicly-owned parks and open spaces that have been designated as natural areas and are not intended for future urban development, and (b) Metro Code Section 3.07.1340(a)(8), related to the restoration of Habitat Conservation Areas when developed property is undergoing significant redevelopment;

(2) Demonstrate that its existing or amended comprehensive plan and existing, amended, or new implementing ordinances substantially comply with the performance standards and best management practices described in Metro Code Section 3.07.1340, and that maps that it has adopted and uses substantially comply with the Metro Habitat Conservation Areas Map;

(3) Demonstrate that it has implemented a program based on alternative approaches that will achieve protection and enhancement of Class I and II riparian habitat areas, and of Class A and B upland wildlife habitat areas in territory added to the Metro UGB after December 28, 2005, substantially comparable with the protection and restoration that would result from the application of a program that complied with Metro Code Sections 3.07.1330(b)(1) or (b)(2). A city or county developing such a program:

(A) Shall demonstrate that its alternative program will provide a certainty of habitat protection and enhancement to achieve its intended results, such as by using proven programs and demonstrating stable and continuing funding

sources sufficient to support elements of the program that require funding;

(B) May assert substantial compliance with this provision by relying on either or both the city's or county's comprehensive plan and implementing ordinances and on the use of incentive based, voluntary, education, acquisition, and restoration programs, such as:

(i) An existing tree protection ordinance;

(ii) A voluntary program for tree protection, tree replacement, and habitat restoration;

(iii) Habitat preservation incentive programs, such as programs that provide reduced development or storm water management fees and property taxes in return for taking measures to protect and restore habitat (including, for example, the Wildlife Habitat Special Tax Assessment Program, ORS 308A.400 through 308A.430, and the Riparian Habitat Tax Exemption Program, ORS 308A.350 through 308A.383);

(iv) Habitat-friendly development standards to reduce the detrimental impact of storm water run-off on riparian habitat;

(v) A local habitat acquisition program; and

(vi) Maintaining and enhancing publicly-owned habitat areas, such as by:

a) Using habitat-friendly best management practices, such as integrated pest management programs, in all regionally significant habitat areas within publicly-owned parks and open spaces;

b) Ensuring that publicly-owned parks and open spaces that have been designated as natural areas and are not intended for future urban development are managed to maintain and enhance the quality of fish and wildlife habitat that they provide; and

c) Pursuing funding to support local park, open space, and habitat acquisition and restoration, such as with local bond measures, System Development Charge (SDC) programs, Federal Emergency Management Act (FEMA) grants, or other funding mechanisms.

(4) District Plans

(a) Adopt one or more district plans that apply over portions of the city or county, and demonstrate that, for the remainder of its jurisdiction, the city or county has a program that complies with either Metro Code Section 3.07.1330(b)(1) or Metro Code Section 3.07.1330(b)(2). If a city or county adopts one or more district plans pursuant to this paragraph, it shall demonstrate that, within each district plan area, the district plan complies with Metro Code Section 3.07.1330(b)(3). District plans shall be permitted under this subsection only for areas within a common watershed, or which are within areas in adjoining watersheds that share an interrelated economic infrastructure and development pattern. Cities and counties that choose to develop district plans are encouraged to coordinate such district plans with other entities whose activities impact the same watershed to which the district plan applies, including other cities and counties, special districts, state and federal agencies, watershed councils, and other governmental and non-governmental agencies.

(b) The City of Portland shall develop a District Plan that complies with Metro Code Section 3.07.1330(b)(4)(a), in cooperation with the Port of Portland, that applies to West Hayden Island; or

(5) For a city or county that is a member of the Tualatin Basin Natural Resources Coordinating Committee (the "TBNRCC," which includes Washington County and the cities of Beaverton, Cornelius, Durham, Forest Grove, Hillsboro, King City, Sherwood, Tigard, and Tualatin), amend its

comprehensive plan and implementing ordinances to comply with the maps and provisions of the TBNRCC Goal 5 Program, attached hereto[5] and incorporated herein by reference, adopted by the TBNRCC on April 4, 2005 (the "Tualatin Basin Program"), subject to the intergovernmental agreement entered into between Metro and the TBNRCC. All other provisions of this Metro Code Section 3.07.1330, as well as Metro Code Section 3.07.1360, shall still apply to each city and county that is a member of the TBNRCC. In addition, in order for a city or county that is a member of the TBNRCC to be in compliance with this functional plan, the following conditions must be satisfied:

(a) Within the compliance timeline described in Paragraph 6 of the Intergovernmental Agreement entered into between Metro and the TBNRCC, the TBNRCC and its members comply with the six (6) steps identified in section B of Chapter 7 of the Tualatin Basin Program;

(b) Clean Water Services approves and begins implementing its Healthy Streams Plan;

(c) The TBNRCC members agree to renew and extend their partnership to implement the projects on the Healthy Streams Project List and target projects that protect and restore Class I and II Riparian Habitat, including habitat that extends beyond the Clean Water Services "vegetated corridors," and the TBNRCC shall continue to coordinate its activities with Metro and cooperate with Metro on the development of regional public information about the Nature in Neighborhoods Initiative;

(d) The city or county has adopted provisions to facilitate and encourage the use of habitat-friendly development practices, where technically feasible and appropriate, in all areas identified as Class I and II riparian habitat areas on the Metro Regionally Significant Fish and Wildlife Habitat Inventory Map. Table 3.07-13c provides examples of the types of habitat-friendly

[5] On file in the Metro Council office and copies available from the Metro Planning Department.

development practices that shall be encouraged and considered;

(e) The city or county has adopted provisions to allow for the reduction of the density and capacity requirements of Title 1 of the Urban Growth Management Functional Plan, Metro Code Sections 3.07.110 to 170, consistent with Metro Code Section 3.07.1330(h). Particularly, the provisions shall (1) apply only to properties that were within the Metro urban growth boundary on January 1, 2002; (2) require the protection of regionally significant habitat on the property, such as via a public dedication or restrictive covenant; and (3) allow only for a reduction in the minimum number of units required to be built based on the amount of area protected as provided in part (2) of this paragraph. In addition, cities and counties will be required to report to Metro as provided in Metro Code Section 3.07.1330(h)(3);

(f) The city or county complies with the provisions of Metro Code Section 3.07.1330(b)(1) to (b)(3) as those provisions apply to upland wildlife habitat in territory added to the Metro urban growth boundary after December 28, 2005. For example, (1) each city and county shall either adopt and apply Metro's Title 13 Model Ordinance to upland wildlife habitat in new urban areas, (2) substantially comply with the requirements of Metro Code Section 3.07.1340 as it applies to upland wildlife habitat in new urban areas, or (3) demonstrate that it has implemented an alternative program that will achieve protection and enhancement of upland wildlife habitat in new urban areas comparable with the protection and restoration that would result from one of the two previous approaches described in this sentence; and

(g) The TBNRCC and the city or county complies with the monitoring and reporting requirements of Metro Code Section 3.07.1360.

(c) The comprehensive plan and implementing ordinances relied upon by a city or county to comply with this

title shall contain clear and objective standards. A standard shall be considered clear and objective if it meets any one of the following criteria:

(1) It is a fixed numerical standard, such as fixed distance (e.g. "50 feet") or land area (e.g. "1 acre");

(2) It is a nondiscretionary requirement, such as a requirement that grading not occur beneath the dripline of a protected tree; or

(3) It is a performance standard that describes the outcome to be achieved, specifies the objective criteria to be used in evaluating outcome or performance, and provides a process for application of the performance standard, such as a conditional use or design review process.

(d) In addition to complying with subsection (c) of this section, the comprehensive plan and implementing ordinances that a city or county relies upon to satisfy the requirements of this title may include an alternative, discretionary approval process that is not clear and objective provided that the comprehensive plan and implementing ordinance provisions of such a process:

(1) Specify that property owners have the choice of proceeding under either the clear and objective approval process, which each city or county must have pursuant to subsection (c) of this section, or under the alternative, discretionary approval process; and

(2) Require a level of protection for, or enhancement of, the fish and wildlife habitat that meets or exceeds the level of protection or enhancement that would be achieved by following the clear and objective standards described in subsection (c) of this section.

(e) Use of Habitat-Friendly Development Practices In Regionally Significant Fish And Wildlife Habitat.

(1) Each city and county in the region shall:

(A) Identify provisions in the city’s or county’s comprehensive plan and implementing ordinances that prohibit or limit the use of the habitat-friendly development practices such as those described in Table 3.07-13c; and

(B) Adopt amendments to the city's or county's comprehensive plan and implementing ordinances to remove the barriers identified pursuant to subsection (e)(1)(a)of this section, and shall remove such barriers so that such practices may be used, where practicable, in all regionally significant fish and wildlife habitat; provided, however that such practices shall not be permitted if their use is prohibited by an applicable and required State or Federal permit issued to a unit of local government having jurisdiction in the area, such as a permit required under the Clean Water Act, 33 U.S.C. §§1251 et seq., or the Safe Drinking Water Act, 42 U.S.C. §§300f et seq., and including conditions or plans required by such permit.

(2) Metro shall provide technical assistance to cities and counties to comply with the provisions of this subsection (e) of this section.

(f) Cities and counties shall hold at least one public hearing prior to adopting comprehensive plan amendments, implementing ordinances, and maps implementing this title or demonstrating that existing city or county comprehensive plans, implementing ordinances, and maps substantially comply with this title. The proposed comprehensive plan amendments, implementing ordinances, and maps shall be available for public review at least 45 days prior to the public hearing.

(g) The comprehensive plan provisions and implementing ordinances that each city or county amends, adopts, or relies on to comply with this title shall provide property owners with a reasonable, timely, and equitable process to verify the specific location of habitat areas subject to the provisions of the city's or county's comprehensive plan and implementing ordinances. It is the intent of this requirement that, in the majority of cases, the process be as simple and straightforward as possible and not result in a change that would require an amendment to the city's or county's comprehensive plan. Such process shall:

(1) Allow a property owner, or another person with the property owner's consent, to confirm the location of habitat on a lot or parcel at any time, whether or not the property owner has submitted a specific

request for a development permit, provided, however, that a city or county may impose a fee to cover the actual staff, equipment and other administrative costs of providing such a service;

(2) As often as reasonably possible, provide a simple, default approach that allows a property owner to verify the location of habitat on a lot or parcel without having to hire an environmental consultant and without having to pay a significant processing or application fee;

(3) Allow a property owner to present detailed documentation to verify the location of habitat on a lot or parcel, such as information collected and analyzed by an environmental consultant; and

(4) Ensure that the process provides adequate opportunities for appeals and a fair and equitable dispute resolution process, consistent with state law.

(h) Reducing Regional Density and Capacity Requirements to Allow Habitat Protection.

(1) Notwithstanding the provisions of Metro Code Section 3.07.120, cities and counties may approve a subdivision or development application that will result in a density below the minimum density for the zoning district if:

(A) The property lot or parcel was within the Metro UGB on January 1, 2002;

(B) An area of the property lot or parcel to be developed has been identified as regionally significant fish and wildlife habitat on the Metro Inventory Map or as a significant resource on a local Goal 5 riparian, wetlands, or wildlife resource inventory map that had been acknowledged by the LCDC prior to December 28, 2005; and

(C) Such a decision will directly result in the protection of the remaining undeveloped regionally significant fish and wildlife habitat or significant resource located on the property lot or parcel, such as via a public dedication or a restrictive covenant.

(2) The amount of reduction in the minimum density requirement that may be approved under this

subsection (h) of this section shall be calculated by subtracting the number of square feet of regionally significant fish and wildlife habitat or significant resource that is permanently protected under subsection (h)(1)(C) of this section from the total number of square feet that the city or county otherwise would use to calculate the minimum density requirement for the property.

(3) If a city or county approves a subdivision or development application that will result in a density below the minimum density for the zoning district pursuant to subsection (h)(1) of this section, then such city or county shall:

(A) Be permitted an offset against the capacity specified for that city or county in Table 3.07-1 of the Metro Code. The amount of such offset shall be calculated by subtracting the difference between the number of dwelling units that the city or county approved to be built pursuant to subsection (h)(1) of this section and the minimum number of dwelling units that would have otherwise been required to be built on the property pursuant to the applicable minimum density requirements for the zoning district where the property is located; and

(B) Report to Metro by April 15 of every year the number of approvals made pursuant to this subsection (h) of this section, including documentation that the factors in subsection (h)(1) had been satisfied for each such approval, and the capacity offsets that the city or county shall be afforded as a result of such approvals.

(Ordinance 05-1077C, Sec. 5. Ordinance 15-1357.)

3.07.1340 Performance Standards and Best Management Practices for Habitat Conservation Areas

The following performance standards and best management practices apply to all cities and counties that choose to adopt or rely upon their comprehensive plans and implementing ordinances to comply, in whole or in part, with Metro Code Section 3.07.1330(b)(2):

(a) City and county comprehensive plans and implementing ordinances shall conform to the following performance standards and best management practices:

(1) Habitat Conservation Areas shall be protected, maintained, enhanced, and restored as specified in this Metro Code Section 3.07.1340, and city and county development codes shall include provisions for enforcement of these performance standards and best management practices.

(2) In addition to requirements imposed by this title, the requirements of Title 3 of the Urban Growth Management Functional Plan, Metro Code Sections 3.07.310 to 3.07.360 shall continue to apply.

(3) The performance standards and best management practices of this Metro Code Section 3.07.1340 shall not apply:

(A) When the application of such standards and practices would restrict or regulate farm structures or farming practices in violation of ORS 215.253 or ORS 561.191; or

(B) In areas outside of the Metro UGB but within the Metro boundary at the effective date of this title:

(i) When such standards and practices violate ORS 527.722 by prohibiting, limiting, regulating, subjecting to approval, or in any other way affecting forest practices on forestlands located outside of an acknowledged urban growth boundary, except as provided in ORS 527.722(2), (3) and (4); or

(ii) Pursuant to ORS 196.107, in areas within Multnomah County and the Columbia River Gorge National Scenic Area, provided that Multnomah County has adopted and implements ordinances that are approved pursuant to sections 7(b) and 8(h) through 8(k) of the Columbia River Gorge National Scenic Area Act, 16 U.S.C. §§ 544e(b) and 544f(h) through 544f(k).

(4) The performance standards and best management practices of this Metro Code Section 3.07.1340 shall not apply to any use of residential

properties if, as of the local program effective date:

(A) Construction of the residence was completed in compliance with all applicable local and state laws and rules for occupancy as a residence or the residence had been occupied as a residence for the preceding ten years; and

(B) Such uses would not have required the property owner to obtain a land use approval or a building, grading, or tree removal permit from their city or county.

(5) Habitat Conservation Areas within publicly-owned parks and open spaces that have been designated as natural areas and are not intended for future urban development shall be protected and managed so that the quality of fish and wildlife habitat that they provide is maintained and enhanced, and that habitat-friendly best management practices, such as integrated pest management programs, are used in such areas.

(6) Invasive non-native or noxious vegetation shall not be planted in any Habitat Conservation Area. The removal of invasive non-native or noxious vegetation from Habitat Conservation Areas shall be allowed. The planting of native vegetation shall be encouraged in Habitat Conservation Areas.

(7) Except as provided in subsection (a)(8) of this section, routine repair, maintenance, alteration, rehabilitation, or replacement of existing structures, roadways, driveways, utilities, accessory uses, or other development within Habitat Conservation Areas may be allowed provided that:

(A) The project is consistent with all other applicable local, state, and federal laws and regulations;

(B) The project will not permanently or irreparably result in more developed area within a Habitat Conservation Area than the area of the existing development; and

(C) Native vegetation is maintained, enhanced and restored, if disturbed; other vegetation is replaced, if disturbed, with vegetation other than invasive non-native or noxious vegetation; and the planting of native

vegetation and removal of invasive non-native or noxious vegetation is encouraged.

(8) Notwithstanding subsection (a)(7) of this section, when a city or county exercises its discretion to approve zoning changes to allow a developed property that contains a Habitat Conservation Area to (1) change from an industrial or heavy commercial zoning designation to a residential or mixed-use/residential designation, or (2) increase the type or density and intensity of development in any area, then the city or county shall apply the provisions of this Metro Code Section 3.07.1340, or provisions that will achieve substantially comparable habitat protection and restoration as do the provisions of this section. This provision will help to insure that, when developed areas are redeveloped in new ways to further local and regional urban and economic development goals, property owners should restore regionally significant fish and wildlife habitat as part of such redevelopment.

(9) Any activity within Habitat Conservation Areas that is required to implement a Federal Aviation Administration (FAA)-compliant Wildlife Hazard Management Plan (WHMP) on property owned by the Port of Portland within 10,000 feet of an Aircraft Operating Area, as defined by the FAA, shall be allowed provided that mitigation for any such projects is completed in compliance with mitigation requirements adopted pursuant to subsections (b)(1), (b)(2)(C), and (b)(3) of this section. In addition, habitat mitigation for any development within Habitat Conservation Areas on property owned by the Port of Portland within 10,000 feet of an Aircraft Operating Area, as defined by the FAA, shall be permitted at any property located within the same 6th Field Hydrologic Unit Code subwatershed as delineated by the Unites States Department of Agriculture's Natural Resources Conservation Service (NRCS) without having to demonstrate that on-site mitigation is not practicable, feasible, or appropriate.

(10) Within Habitat Conservation Areas located in Multnomah County Drainage District No. 1, Peninsula Drainage District No. 1, Peninsula Drainage

District No. 2, and the area managed by the Sandy Drainage Improvement Company, routine operations, repair, maintenance, reconfiguration, rehabilitation, or replacement of existing drainage and flood control facilities, and existing related facilities, including any structures, pump stations, water control structures, culverts, irrigation systems, roadways, utilities, accessory uses (such as off-load facilities that facilitate water-based maintenance), erosion control projects, levees, soil and bank stabilization projects, dredging and ditch clearing within the hydraulic cross-section in existing storm water conveyance drainageways, or other water quality and flood storage projects applicable to existing facilities and required to be undertaken pursuant to ORS Chapters 547 or 554 or Titles 33 or 44 of the Code of Federal Regulations, shall be allowed provided that:

(A) The project is consistent with all other applicable local, state, and federal laws and regulations;

(B) The project does not encroach closer to a surface stream or river, wetland, or other body of open water than existing operations and development;

(C) Disturbed areas are replanted with vegetation and no bare soils remain after project completion; the planting of native vegetation and removal of invasive non-native or noxious vegetation is encouraged; and invasive non-native or noxious vegetation shall not be planted; and

(D) Each district submits an annual report, to all local permitting agencies in which the district operates, describing the projects the district completed in the previous year and how those projects complied with all applicable federal and state laws and requirements.

(b) City and county comprehensive plans and implementing ordinances shall contain review standards applicable to development in all Habitat Conservation Areas that include:

(1) Clear and objective development approval standards consistent with Metro Code Section 3.07.1330(c) that protect Habitat Conservation Areas but which allow limited development within High Habitat Conservation Areas, slightly more development in Moderate Habitat Conservation Areas, and even more development in Low Habitat Conservation Areas. Such standards shall allow (a) property owners to consider reduced building footprints and the use of minimal excavation foundation systems (e.g., pier, post or piling foundation), and (b) the flexible application of local code requirements that may limit a property owner's ability to avoid development in Habitat Conservation Areas, such as setback and landscaping requirements or limits on clustering and the transfer of development rights on-site. The habitat-friendly development practices described in Table 3.07-13c, which are intended to minimize the magnitude of the impact of development in Habitat Conservation Areas, shall be allowed, encouraged, or required to the extent that cities and counties can develop clear and objective standards for their use, unless their use is prohibited by an applicable and required State or Federal permit issued to a unit of local government having jurisdiction in the area, such as a permit required under the Clean Water Act, 33 U.S.C. §§1251 et seq., or the Safe Drinking Water Act, 42 U.S.C. §§300f et seq., and including conditions or plans required by such permit. The clear and objective development standards required by this paragraph also shall require that all development in Habitat Conservation Areas be mitigated to restore the ecological functions that are lost or damaged as a result of the development. Standards that meet the requirements of this subsection and Metro Code Section 3.07.1330(c) are provided in Section (7) of the Metro Title 13 Model Ordinance[6]; and

(2) Discretionary development approval standards consistent with Metro Code Section 3.07.1330(d) that comply with subsections (b)(2)(A), (b)(2)(B), and (b)(2)(C) of this section. Standards that meet the requirements of this subsection (b)(2) and

[6] On file in the Metro Council office and copies available from the Metro Planning Department.

Metro Code Section 3.07.1330(d) are provided in Section (8) of the Metro Title 13 Model Ordinance.

(A) Avoid Habitat Conservation Areas.

(i) Development may occur within a Habitat Conservation Area only if a property owner demonstrates that no practicable alternatives to the requested development exist which will not disturb the Habitat Conservation Area;

(ii) When implementing this requirement to determine whether a practicable alternative exists, cities and counties shall include consideration of the type of Habitat Conservation Area that will be affected by the proposed development. For example, High Habitat Conservation Areas have been so designated because they are areas that have been identified as having lower urban development value and higher-valued habitat, while Low Habitat Conservation Areas have been so designated because they are areas that have been identified as having higher urban development value and lower-valued habitat; and

(iii) Cities and counties shall allow flexibility in the application of local code requirements that may limit a property owner's ability to avoid development in Habitat Conservation Areas, such as setback and landscaping requirements or limits on clustering and the transfer of development rights on-site. Property owners shall also consider reduced building footprints and use of minimal excavation foundation systems (e.g., pier, post or piling foundation). The use of the techniques described in this paragraph shall be part of the alternatives analysis to determine whether any alternative to development within the Habitat Conservation Area is practicable; and

(B) Minimize Impacts on Habitat Conservation Areas and Water Quality.

(i) If there is no practicable alternative, limit the development to minimize, to the extent practicable, the detrimental impacts on Habitat Conservation Areas associated with the proposed development;

(ii) When implementing this requirement to determine whether development has been minimized to the extent practicable, cities and counties shall include consideration of the type of Habitat Conservation Area that will be affected by the proposed development. For example, High Habitat Conservation Areas have been so designated because they are areas that have been identified as having lower urban development value and higher-valued habitat, while Low Habitat Conservation Areas have been so designated because they are areas that have been identified as having higher urban development value and lower-valued habitat; and

(iii) The techniques described in subsection (b)(2)(A)(iii) of this section shall be used to demonstrate that development within a Habitat Conservation Area has been minimized. In addition, the magnitude of the impact of development within Habitat Conservation Areas also shall be minimized, such as by use of the habitat-friendly development practices described in Table 3.07-13c, unless the use of such practices is prohibited by an applicable and required State or Federal permit issued to a unit of local government having jurisdiction in the area, such as a permit required under the Clean Water Act, 33 U.S.C. §§1251 et seq., or the Safe Drinking Water Act, 42 U.S.C. §§300f et seq., and including conditions or plans required by such permit; and

(C) Mitigate Impacts on Habitat Conservation Areas and Water Quality.

When development occurs, require mitigation to restore the ecological functions that were

lost or damaged as a result of the development, after taking into consideration the property owner's efforts to minimize the magnitude of the detrimental impacts through the use of the techniques described in Table 3.07-13c and through any additional or innovative techniques.

(3) When development occurs within delineated wetlands, then the mitigation required under subsections (b)(1) and (b)(2) of this title shall not require any additional mitigation than the mitigation required by state and federal law for the fill or removal of such wetlands.

(c) City and county comprehensive plans and implementing ordinances shall include procedures to consider claims of hardship and to grant hardship variances for any property demonstrated to be converted to an unbuildable lot by application of any provisions implemented to comply with the requirements of this title.

(d) Administering the Habitat Conservation Areas Map and Site-Level Verification of Habitat Location.

(1) Each city and county shall be responsible for administering the Habitat Conservation Areas Map, or the city's or county's map that has been deemed by Metro to be in substantial compliance with the Habitat Conservation Areas Map, within its jurisdiction, as provided in this subsection (d) of this section.

(2) The comprehensive plan and implementing ordinances amended, adopted or relied upon to comply with this subsection (d) of this section shall comply with Metro Code Section 3.07.1330(g).

(3) Verification of the Location of Habitat Conservation Areas. Each city and county shall establish a verification process consistent with subsections (d)(4) through (d)(6) of this section. The site-level verification of Habitat Conservation Areas is a three-step process. The first step is determining the boundaries of the habitat areas on the property, as provided in subsection (d)(4) of this section. The second step is determining the urban development value of the property, as provided in subsection (d)(5) of this section. The third step is cross-referencing the habitat classes with the urban development value of the property to

determine whether the property contains High, Moderate, or Low Habitat Conservation Areas, or none at all, as provided in subsection (d)(6) of this section.

(4) Habitat Boundaries.

(A) Locating riparian habitat and determining its habitat class is a five-step process.

(i) Step 1. Locate the water feature that is the basis for identifying riparian habitat:

1) Locate the top of bank of all streams, rivers, and open water within 200 feet of the property;

2) Locate all flood areas within 100 feet of the property (areas that were mapped as flood areas but were filled to a level above the base flood level prior to the local program effective date, consistent with all applicable local, state, and federal laws and regulations shall no longer be considered habitat based on their status as flood areas); and

3) Locate all wetlands within 150 feet of the property based on the Local Wetland Inventory map (if completed) and on the Metro 2004 Wetland Inventory Map (available from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232; 503-797-1742). Identified wetlands shall be further delineated consistent with methods currently accepted by the Oregon Division of State Lands and the U.S. Army Corps of Engineers.

(ii) Step 2. Identify the vegetative cover status of all areas on the property that are within 200 feet of the top of bank of streams, rivers, and open water, are wetlands or are within 150 feet of wetlands, and are flood areas and within 100 feet of flood areas:

1) Vegetative cover status shall be as identified on the Metro Vegetative Cover Map, attached hereto[7] and incorporated herein by reference. The vegetative cover type assigned to any particular area was based on two factors: the type of vegetation observed in aerial photographs and the size of the overall contiguous area of vegetative cover to which a particular piece of vegetation belonged. As an example of how the categories were assigned, in order to qualify as "forest canopy" the forested area had to be part of a larger patch of forest of at least one acre in size; and

2) In terms of mapping the location of habitat, the only allowed corrections to the vegetative cover status of a property are those based on an area being developed prior to the local program effective date and those based on errors made at the time the vegetative cover status was determined based on analysis of the aerial photographs used to create the Metro Vegetative Cover Map (for the original map, the aerial photos used were Metro's summer 2002 photos) and application of the vegetative cover definitions provided in the footnotes to Table 3.07-13d.

(iii) Step 3. Determine whether the degree that the land slopes upward from all streams, rivers, and open water within 200 feet of the property is greater than or less than 25% (using the methodology described in the Appendix to Exhibit A to Ordinance 00-839 re-adopting Title 3 of the Urban Growth Management Functional Plan).

(iv) Step 4. Identify the habitat class (Class I, Class II, or none) of the

[7] On file in the Metro Council office and copies available from the Metro Data Resource Center.

areas within up to 200 feet of the identified water feature, consistent with Table 3.07-13d. Note that areas that have been identified as habitats of concern, as depicted on the Metro Habitats of Concern Map, attached hereto[8] and incorporated herein by reference, are all classified as Class I riparian habitat.

(v) Step 5. Confirm that the development and vegetative cover status of areas within up to 200 feet of the identified water feature has not been altered without the required approval of the city or county since the local program effective date and, if it has, then verify the original habitat location using the best available evidence of its location on the local program effective date.

(B) For territory brought within the Metro UGB after December 28, 2005, the location of upland wildlife habitat and its habitat class shall be as identified in Metro's habitat inventory of such territory performed pursuant to Metro Code Section 3.07.1370. The only factors that may be reviewed to verify the location of upland wildlife habitat shall be:

(i) For territory that was within the Metro boundary on December 28, 2005, whether regionally significant fish and wildlife habitat was removed, consistent with all other applicable local, state, and federal laws and regulations, prior to the date that the property was brought within the Metro UGB and, if so, then areas where habitat was removed shall not be identified as Habitat Conservation Areas;

(ii) Whether errors were made at the time the vegetative cover status was determined based on (1) analysis of the aerial photographs used to determine the vegetative cover status, and (2)

[8] On file in the Metro Council office and copies available from the Metro Data Resource Center.

application of the vegetative cover definitions provided in the footnotes to Table 3.07-13d; and

(iii) Whether there are discrepancies between the locations of property lot lines and the location of Habitat Conservation Areas, as shown on the Habitat Conservation Areas Map.

(5) Urban Development Value of the Property. The urban development value of property designated as regionally significant habitat is depicted on the Metro Habitat Urban Development Value Map, attached hereto[9] and incorporated herein by reference. The Metro Habitat Urban Development Value Map is based on an assessment of three variables, the land value of property, the employment value of property, and the Metro 2040 Design Type designation of property. Cities and counties shall make an upward adjustment of a property's urban development value designation (i.e., from low to medium or high, or from medium to high) if:

(A) The Metro 2040 Design Type designation has changed from a category designated as a lower urban development value category to one designated as a higher urban development value category. Properties in areas designated as the Central City, Regional Centers, Town Centers, and Regionally Significant Industrial Areas are considered to be of high urban development value; properties in areas designated as Main Streets, Station Communities, Other Industrial Areas, and Employment Centers are of medium urban development value; and properties in areas designated as Neighborhoods and Corridors are of low urban development value; or

(B) The property, or adjacent lots or parcels, is owned by a regionally significant educational or medical facility and, for that reason, should be designated as of high urban development value because of the economic contributions the facility provides to the citizens of the region.

[9] On file in the Metro Council office and copies available from the Metro Data Resource Center.

(i) The following facilities are regionally significant educational or medical facilities, as further identified on the Regionally Significant Educational or Medical Facilities Map, attached hereto[10]:

1) Clackamas Community College, 19600 S. Molalla Ave., Oregon City;

2) Lewis & Clark College, 0615 SW Palatine Hill Rd., Portland;

3) Marylhurst University, 17600 Hwy 43, in Lake Oswego;

4) Mt. Hood Community College, 26000 SE Stark St., Gresham;

5) Oregon Health Sciences University, 3181 SW Sam Jackson Park Rd., Portland;

6) Oregon Health Sciences University, Portland South Waterfront, Portland;

7) Oregon Health Sciences University /Oregon Graduate Institute, 20000 NW Walker, Hillsboro;

8) Pacific University, 2043 College Way, Forest Grove;

9) Portland Community College, Rock Creek Campus, 17865 NW Springdale Rd., Portland;

10) Portland Community College, Sylvania Campus, 12000 SW 49th Ave., Portland;

11) Providence St. Vincent Medical Center, 9115 SW Barnes Rd., Portland;

12) Reed College, 3203 SE Woodstock Blvd., Portland;

13) University of Portland, 5000 N. Willamette Blvd., Portland; and

14) Veterans Hospital, 3710 SW U.S. Veterans Hospital Rd., Portland.

(ii) The Metro Council may add a property to the list of facilities identified in

[10] On file in the Metro Council office.

subsection (d)(5)(B)(i) of this section in the future by adopting an ordinance amending that section if the Council finds that the use of the property:

1) Supports the 2040 Growth Concept by providing a mixed-use environment that may include employment, housing, retail, cultural and recreational activities, and a mix of transportation options such as bus, bicycling, walking, and auto;

2) Provides, as a primary objective, a service that satisfies a public need rather than just the consumer economy (i.e., producing, distributing, selling or servicing goods);

3) Draws service recipients (e.g., students, patients) from all reaches of the region and beyond;

4) Relies on capital infrastructure that is so large or specialized as to render its relocation infeasible; and

5) Has a long-term campus master plan that has been approved by the city or county in which it is located.

(5) Cross-Referencing Habitat Class With Urban Development Value. City and county verification of the locations of High, Moderate, and Low Habitat Conservation Areas shall be consistent with Tables 3.07-13a and 3.07-13b.

(Ordinance 05-1077C, Section 5.)

3.07.1350 Claims Pursuant to ORS 195.305(Ballot Measure 49)

(a) The purpose of this section is to provide for Metro to accept potential liability for claims filed against cities and counties pursuant to ORS 195.305 (Ballot Measure 49) as a result of the cities' and counties' good faith implementation of Metro Code Sections 3.07.1310 through 3.07.1370. As a corollary of accepting financial and administrative responsibility for these claims, Metro seeks the authority and cooperation of cities and counties in the evaluation and settlement of claims.

(b) Provided that cities and counties meet the requirements set out below, Metro shall indemnify a city or county for any claim made against a city or county based on its implementation of the requirements of Metro Code Sections 3.07.1310 through 3.07.1370. In order to receive the benefits of this provision, a city or county must:

(1) Upon receipt of a written demand for compensation pursuant to ORS 195.305, from an owner of private real property located within its jurisdiction alleging that a comprehensive plan amendment or land use regulation adopted or relied upon to comply with the requirements of this title reduces the fair market value of the property, a city or county shall forward a copy of the demand to Metro no later than seven (7) days following receipt of the demand;

(2) Reasonably cooperate with Metro throughout Metro's consideration and disposition of the claim, including promptly providing Metro with any information related to the property in question, to an assessment of its fair market value, or to the city's or county's adoption of the comprehensive plan amendment or land use regulation that is the basis of the demand made pursuant to ORS 195.305; and

(3) Substantially concur with Metro's recommendation regarding disposition of the claim, which disposition may include, but not be limited to, a cash payment or other compensation, a decision to modify, remove, or not apply the regulation, dismissal of the claim, and the imposition of appropriate conditions. Metro shall forward to the city or county Metro's recommended disposition of the claim within 120 days of Metro's receipt of notice of the claim from the city or county; provided, however, that if Metro does not provide such recommendation within the 120 day deadline then the city or county may dispose of the claim as it determines appropriate and Metro will neither indemnify the city or county for the claim nor use the city's or county's decision on the claim as a basis for finding that the city or county is not in compliance with this title. A city or county may also satisfy this requirement by entering into an intergovernmental agreement with Metro in order to

grant Metro sufficient authority to implement, on the city or county's behalf, Metro's recommendation regarding the disposition of the claim.

(Ordinance 05-1077C, Section 5. Ordinance 15-1357.)

3.07.1360 Program Objectives, Monitoring and Reporting

This section describes the program performance objectives, the roles and responsibilities of Metro, cities, counties, and special districts in regional data coordination and inventory maintenance, monitoring and reporting, and program evaluation.

(a) The following program objectives are established:

(1) Performance objectives:

(A) Preserve and improve streamside, wetland, and floodplain habitat and connectivity;

(B) Preserve large areas of contiguous habitat and avoid habitat fragmentation;

(C) Preserve and improve connectivity for wildlife between riparian corridors and upland wildlife habitat; and

(D) Preserve and improve special habitats of concern such as native oak habitats, native grasslands, wetlands, bottomland hardwood forests, and riverine islands.

(2) Implementation objectives:

(A) Increase the use of habitat-friendly development throughout the region; and

(B) Increase restoration and mitigation actions to compensate for adverse effects of new and existing development on ecological function.

(b) Program Monitoring and Evaluation.

(1) Metro will monitor the region's progress toward meeting the vision of conserving, protecting, and restoring the region's fish and wildlife habitat and the intent of this title by:

(A) Developing and monitoring regional indicators and targets as set forth in Table 3.07-13e to evaluate progress in achieving the four performance objectives described in subsection (a)(1) of this section;

(B) Developing and monitoring regional indicators as set forth in Table 3.07-13e to evaluate progress in achieving the two implementation objectives described in subsection (a)(2) of this section;

(C) Collaborating with local, state, and federal agencies and non-governmental organizations in carrying out field studies and data sharing to increase understanding of the health of the region's watersheds and to identify restoration opportunities and priorities; and

(D) Preparing and presenting monitoring and program evaluation reports to Metro Council no later than December 31, 2006, and by December 31 of each even-numbered year thereafter.

(2) Metro will practice adaptive management by using the results of monitoring studies and the availability of new information to assess whether the goals, objectives, and targets of this title are being achieved.

(c) Reporting Requirements for Cities and Counties.

(1) Cities and counties shall report to Metro no later than December 31, 2007, and by December 31 of each odd-numbered year thereafter on their progress in using voluntary and incentive-based education, acquisition, and restoration habitat protection efforts; and

(2) At least 45 days prior to a city's or county's final public hearing on a proposed new or amended ordinance or regulation relating to protection of, or mitigation of damage to, habitat, trees or other vegetation, cities and counties shall mail written notice of the proposed ordinance or regulation to Metro. Cities and counties that require applications for land use approvals or building, grading, or tree removal permits to include documentation that the development meets habitat, tree, or vegetation protection and mitigation requirements adopted by a special district, including any county service district established pursuant to ORS chapter 451, shall mail written notice to Metro of any proposed new or amended ordinance or regulation relating to protection of, or mitigation of damage to, trees or other vegetation that is proposed by such a special

district at least 45 days prior to the special district's final public hearing on the proposed new or amended ordinance or regulation.

(d) Regional Data Coordination and Maintenance.

(1) Metro will act as the regional coordinator for Geographic Information System (GIS) data used to create and maintain the Regionally Significant Fish and Wildlife Habitat Inventory Map and other data relevant to program implementation, monitoring, and evaluation. To carry out this role cities and counties shall provide Metro with local data in a timely fashion and in a form compatible with Metro's GIS program. To the extent that such data is collected by county service districts established pursuant to ORS chapter 451, then the county in which the county service district operates shall comply with this section. Such data shall include:

(A) Adopted and revised Local Wetland Inventories approved by the Division of State Lands and those determined to be locally significant under ORS 197.279(3)(b);

(B) Wetland mitigation sites approved by the Division of State Lands or U.S. Army Corps of Engineers;

(C) For cities and counties that have not carried out Local Wetland Inventories, wetland boundaries delineated using accepted protocols by Division of State Lands or U.S. Army Corps of Engineers;

(D) Revised or updated local surface stream inventories;

(E) Revised or updated 100-year Federal Emergency Management Act (FEMA) flood area maps or revisions to the 1996 area of inundation maps to incorporate FEMA-approved floodplain map revisions or floodplain fills approved by the U.S. Army Corps of Engineers;

(F) Completed restoration and enhancement projects; and

(G) Revised or updated Metro Habitats of Concern data layer.

(2) Metro will periodically update its Regionally Significant Fish and Wildlife Habitat Inventory for use in program monitoring and evaluation. Metro will maintain a study area boundary one mile beyond the perimeter of the Metro boundary and Metro Urban Growth Boundary.

(Ordinance 05-1077C, Sec. 5. Ordinance 15-1357.)

3.07.1370 Future Metro Urban Growth Boundary Expansion Areas

The Metro Inventory Map identifies regionally significant fish and wildlife habitat within the entire Metro boundary, including areas outside of the Metro UGB at the time this title was adopted. As described in Metro Code Section 3.07.1320, the Metro Council has designated as Habitat Conservation Areas the regionally significant fish and wildlife habitat that has been identified as riparian Class I and II habitat within the Metro boundary. In addition, the Metro Council has also determined that the regionally significant fish and wildlife habitat identified as upland wildlife Class A and B habitat that is currently outside of the Metro UGB shall be designated as Habitat Conservation Areas at such time that those areas are brought within the Metro UGB. Territory where the Metro UGB may expand includes both areas within the current Metro boundary and areas outside of the current Metro boundary.

(a) New Urban Territory that was Previously Within the Metro Boundary.

The Metro Inventory Map already identifies the regionally significant upland wildlife Class A and B habitat in territory within the current Metro boundary but outside the current Metro UGB. At the time such territory is brought within the Metro UGB, consistent with Title 11 of this functional plan, Metro Code Sections 3.07.1110 et seq., Metro shall update its inventory of regionally significant fish and wildlife habitat for such territory using the same methodology used by Metro to establish the Metro Inventory Map. Based on the updated Metro Inventory Map, Metro shall prepare a Habitat Conservation Areas Map for such new territory, as described in Metro Code Section 3.07.1320(c), using the 2040 Design Types that are assigned to such territory to determine the area's urban development value.

(b) New Urban Territory that was Previously Outside of the Metro Boundary.

At the time such territory is brought within the Metro UGB, consistent with Title 11 of this functional plan, Metro Code Sections 3.07.1110 et seq., Metro shall prepare an inventory of regionally significant fish and wildlife habitat for such territory using the same methodology used by Metro to establish the Metro Inventory Map. Upon adoption of such inventory, Metro shall update its Metro Inventory Map to include such information. Based on the updated Metro Inventory Map, Metro shall prepare a Habitat Conservation Areas Map for such new territory, as described in Metro Code Section 3.07.1320(b), using the 2040 Design Types that are assigned to such territory to determine the area's urban development value.

(c) Metro recognizes that the assigned 2040 Design Types may change as planning for territory added to the Metro UGB progresses, and that the relevant Habitat Conservation Area designations will also change as a result of the 2040 Design Type changes during such planning.

(Ordinance 05-1077C, Sec. 5.)

Table 3.07-13a: Method for Identifying Habitat Conservation Areas ("HCA")

Fish & wildlife habitat classification	High Urban development value[1]	Medium Urban development value[2]	Low Urban development value[3]	Other areas: Parks and Open Spaces, no design types outside UGB
Class I Riparian	Moderate HCA	High HCA	High HCA	High HCA / High HCA+[4]
Class II Riparian	Low HCA	Low HCA	Moderate HCA	Moderate HCA / High HCA+[4]
Class A Upland Wildlife	No HCA	No HCA	No HCA	No HCA / High HCA[5] / High HCA+[4]
Class A Upland Wildlife	No HCA	No HCA	No HCA	No HCA / High HCA[5] / High HCA+[4]

NOTE: The default urban development value of property is as depicted on the Metro Habitat Urban Development Value Map. The Metro 2040 Design Type designations provided in the following footnotes are only for use when a city or county is determining whether to make an adjustment pursuant to Metro Code Section 3.07.1340(e)(5).

[1] Primary 2040 design types: Regional Centers, Central City, Town Centers, and Regionally Significant Industrial Areas

[2] Secondary 2040 design types: Main Streets, Station Communities, Other Industrial Areas, and Employment Centers

[3] Tertiary 2040 design types: Neighborhoods, Corridors

[4] Cities and counties shall give Class I and II riparian habitat and Class A and B upland wildlife habitat in parks designated as natural areas even greater protection than that afforded to High Habitat Conservation Areas, as provided in Metro Code Section 3.07.1340(a)(5).

[5] All Class A and B upland wildlife habitat in publicly-owned parks and open spaces, except for parks and open spaces where the acquiring agency clearly identified that it was acquiring the property to develop it for active recreational uses, shall be considered High HCAs.

Table 3.07-13b: Method for Identifying Habitat Conservation Areas ("HCA") in Future Metro Urban Growth Boundary Expansion Areas

Fish & wildlife habitat classifi-cation	High Urban development value[1]	Medium Urban development value[2]	Low Urban development value[3]	Other areas: Parks and Open Spaces, no design types outside UGB
Class I Riparian	Moderate HCA	High HCA	High HCA	High HCA / High HCA+[4]
Class II Riparian	Low HCA	Low HCA	Moderate HCA	Moderate HCA / High HCA+[4]
Class A Upland Wildlife	Low HCA	Moderate HCA	Moderate HCA	High HCA / High HCA[5] / High HCA+[4]
Class B Upland Wildlife	Low HCA	Low HCA	Moderate HCA	Moderate HCA / High HCA[5] / High HCA+[4]

NOTE: The default urban development value of property is as depicted on the Metro Habitat Urban Development Value Map. The Metro 2040 Design Type designations provided in the following footnotes are only for use when a city or county is determining whether to make an adjustment pursuant to Metro Code Section 3.07.1340(e)(5).

[1] Primary 2040 design types: Regional Centers, Central City, Town Centers, and Regionally Significant Industrial Areas.

[2] Secondary 2040 design types: Main Streets, Station Communities, Other Industrial Areas, and Employment Centers.

[3] Tertiary 2040 design types: Neighborhoods, Corridors

[4] Cities and counties shall give Class I and II riparian habitat and Class A and B upland wildlife habitat in parks designated as natural areas even greater protection than that afforded to High Habitat Conservation Areas, as provided in Metro Code Section 3.07.1340(a)(5).

[5] All Class A and B upland wildlife habitat in publicly-owned parks and open spaces, except for parks and open spaces where the acquiring agency clearly identified that it was acquiring the property to develop it for active recreational uses, shall be considered High HCAs.

Table 3.07-13c. Habitat-friendly Development Practices

Part (a): Design and Construction Practices to Minimize Hydrologic Impacts
1. Amend disturbed soils to original or higher level of porosity to regain infiltration and stormwater storage capacity.
2. Use pervious paving materials for residential driveways, parking lots, walkways, and within centers of cul-de-sacs.
3. Incorporate stormwater management in road right-of-ways.
4. Landscape with rain gardens to provide on-lot detention, filtering of rainwater, and groundwater recharge.
5. Use green roofs for runoff reduction, energy savings, improved air quality, and enhanced aesthetics.
6. Disconnect downspouts from roofs and direct the flow to vegetated infiltration/filtration areas such as rain gardens.
7. Retain rooftop runoff in a rain barrel for later on-lot use in lawn and garden watering.
8. Use multi-functional open drainage systems in lieu of more conventional curb-and-gutter systems.
9. Use bioretention cells as rain gardens in landscaped parking lot islands to reduce runoff volume and filter pollutants.
10. Apply a treatment train approach to provide multiple opportunities for storm water treatment and reduce the possibility of system failure.
11. Reduce sidewalk width and grade them such that they drain to the front yard of a residential lot or retention area.
12. Reduce impervious impacts of residential driveways by narrowing widths and moving access to the rear of the site.
13. Use shared driveways.
14. Reduce width of residential streets, depending on traffic and parking needs.
15. Reduce street length, primarily in residential areas, by encouraging clustering and using curvilinear designs.
16. Reduce cul-de-sac radii and use pervious vegetated islands in center to minimize impervious effects, and allow them to be utilized for truck maneuvering/loading to reduce need for wide loading areas on site.
17. Eliminate redundant non-ADA sidewalks within a site (i.e., sidewalk to all entryways and/or to truck loading areas may be unnecessary for industrial developments).
18. Minimize car spaces and stall dimensions, reduce parking ratios, and use shared parking facilities and structured parking.
19. Minimize the number of stream crossings and place crossing perpendicular to stream channel if possible.
20. Allow narrow street right-of-ways through stream corridors whenever possible to reduce adverse impacts of transportation corridors.

Part (b): Design and Construction Practices to Minimize Impacts on Wildlife Corridors and Fish Passage
1. Carefully integrate fencing into the landscape to guide animals toward animal crossings under, over, or around transportation corridors.
2. Use bridge crossings rather than culverts wherever possible.
3. If culverts are utilized, install slab, arch or box type culverts, preferably using bottomless designs that more closely mimic stream bottom habitat.
4. Design stream crossings for fish passage with shelves and other design features to facilitate terrestrial wildlife passage.
5. Extend vegetative cover through the wildlife crossing in the migratory route, along with sheltering areas.
Part (c): Miscellaneous Other Habitat-Friendly Design and Construction Practices
1. Use native plants throughout the development (not just in HCA).
2. Locate landscaping (required by other sections of the code) adjacent to HCA.
3. Reduce light-spill off into HCAs from development.
4. Preserve and maintain existing trees and tree canopy coverage, and plant trees, where appropriate, to maximize future tree canopy coverage.

Table 3.07-13d: Locating Boundaries of Class I and II Riparian Areas

Distance from Water Feature	Development/Vegetation Status[1]			
	Developed areas not providing vegetative cover[2]	Low structure vegetation or open soils[3]	Woody vegetation (shrub and scattered forest canopy)[4]	Forest Canopy (closed to open forest canopy)[5]
Surface Streams				
0-50'	Class II [6]	Class I [7]	Class I	Class I
50'-100'		Class II [6]	Class I	Class I
100'-150'		Class II if slope>25% [6]	Class II if slope>25% [6]	Class II [6]
150'-200'		Class II if slope>25% [6]	Class II if slope>25% [6]	Class II if slope>25% [6]
Wetlands (Wetland feature itself is a Class I Riparian Area)				
0-100'		Class II [6]	Class I	Class I
100'-150'				Class II [6]
Flood Areas				
Within 300' of river or surface stream		Class I	Class I	Class I
More than 300' from river or surface stream	[8]	Class II [6]	Class II [6]	Class I
0-100' from edge of flood area			Class II [6, 9]	Class II [6]

[1] Development/vegetative cover status is identified on the Metro Vegetative Cover Map (on file in the Metro Council office). The vegetative cover type assigned to any particular area was based on two factors: the type of vegetation observed in aerial photographs and the size of the overall contiguous area of vegetative cover to which a particular piece of vegetation belonged.

[2] "Developed areas not providing vegetative cover" are areas that lack sufficient vegetative cover to meet the one-acre minimum mapping unit for any type of vegetative cover.

[3] "Low structure vegetation or open soils" means areas that are part of a contiguous area one acre or larger of grass, meadow, crop-lands, or areas of open soils located within 300 feet of a surface stream (low structure vegetation areas may include areas of shrub vegetation less than one acre in size if they are contiguous with areas of grass, meadow, crop-lands, orchards, Christmas tree farms, holly farms, or areas of open soils located within 300 feet of a surface stream and together form an area of one acre in size or larger).

[4] "Woody vegetation" means areas that are part of a contiguous area one acre or larger of shrub or open or scattered forest canopy (less than 60% crown closure) located within 300 feet of a surface stream.

5 "Forest canopy" means areas that are part of a contiguous grove of trees of one acre or larger in area with approximately 60% or greater crown closure, irrespective of whether the entire grove is within 200 feet of the relevant water feature.

[6] Areas that have been identified as habitats of concern, as designated on the Metro Habitats of Concern Map (on file in the Metro Council office and copies available from the Metro Data Resource Center), shall be treated as Class I riparian habitat areas in all cases, subject to the provision of additional information that establishes that they do not meet the criteria used to identify habitats of concern as described in Metro's Technical Report for Fish and Wildlife. Examples of habitats of concern include: Oregon white oak woodlands, bottomland hardwood forests, wetlands, native grasslands, riverine islands or deltas, and important wildlife migration corridors.

[7] Except that areas within 50 feet of surface streams shall be Class II riparian areas if their vegetation status is "Low structure vegetation or open soils," and if they are high gradient streams. High gradient streams are identified on the Metro Vegetative Cover Map. If a property owner believes the gradient of a stream was incorrectly identified, then the property owner may demonstrate the correct classification by identifying the channel type using the methodology described in the Oregon Watershed Assessment Manual, published by the Oregon Watershed Enhancement Board, and appended to the Metro's Riparian Corridor and Wildlife Habitat Inventories Report, Attachment 1 to Exhibit F to this ordinance.

[8] If development prior to the effective date of this title within a contiguous, undeveloped flood area (to include contiguous flood areas on adjacent properties) that was not mapped as having any vegetative cover has reduced the size of that contiguous flood area to less than one half of an acre in size, then the remaining flood area shall also be considered a developed flood area and shall not be identified as habitat.

[9] Only if within 300 feet of a river or surface stream.

Table 3.07-13e: Performance and Implementation Objectives and Indicators

Performance Objectives	Targets	Targeted Condition Based on 2004 Metro Inventory	Example Indicators
Performance Objective 1: Preserve and improve streamside, wetland, and flood area habitat and connectivity.	1a. *10% increase in forest and other vegetated acres within 50 feet* of streams (on each side) and wetlands in each sub-watershed over the next 10 years (2015).	1a. 2004 Baseline Condition (regional data): 64% vegetated 14,000 vegetated acres	Percentage of acres within 50 feet of streams (on each side) and wetlands with any vegetation
		10% increase: 70% vegetated 1,400 acre increase in vegetation over 10 years	
	1b. *5% increase in forest and other vegetated acres within 50 to 150 feet of streams* (on each side) and wetlands in each subwatershed over the next 10 years (2015).	1b. 2004 Baseline Condition (regional data): 59% vegetated 15,250 vegetated acres	Percentage of acres within 50 feet of streams (on each side) and wetlands with forest canopy Percentage of acres between 50 and 150 feet of streams (on each side) and wetlands with any vegetation
		5% increase: 62% vegetated 760 acre increase in vegetation over 10 years	

Performance Objectives	Targets	Targeted Condition Based on 2004 Metro Inventory	Example Indicators
	1c. No more than *10% increase in developed flood area acreage* in each subwatershed over the next 10 years (2015).	1c. 2004 Baseline Condition (regional data): 10% of all flood area acres are developed 3,450 total acres of developed flood areas 10% increase: 3,800 total acres of developed flood areas	Percentage of acres between 50 and 150 feet of streams (on each side) and wetlands with forest canopy Number of acres of Class I and II Riparian Habitat Percentage of flood area acres that are developed* * "Developed" for purposes of this indicator means the methodology used in Metro's Fish and Wildlife Inventory to identify developed flood areas.

Performance Objectives	Targets	Targeted Condition Based on 2004 Metro Inventory	Example Indicators
Performance Objective 2: Preserve large areas of contiguous habitat and avoid fragmentation.	2a. *Preserve 75% of vacant Class A and B* upland wildlife habitat in each subwatershed over the next 10 years (2015).	2a. 2004 Baseline Condition: 15,500 acres of vacant Class A and B upland wildlife habitat	Number of acres of Class A habitat Number of acres of Class B habitat Number of wildlife habitat patches that contain 30 acres or more of upland wildlife habitat
		5% retention: 11,600 acres of vacant Class A and B upland wildlife habitat remaining	
	2b. Of the upland habitat reserved, *retain 80% of the number of patches 30 acres or larger* in each subwatershed over the next 10 years (2015).	2b. 2004 Baseline Condition: 23,400 acres of upland habitat in 133 patches that contain 30 acres or more of upland wildlife habitat	
		80% retention: 106 upland habitat patches that contain 30 acres or more of upland habitat	
Performance Objective 3: Preserve and improve connectivity for wildlife between riparian corridors and upland wildlife	3a. *Preserve 90% of forested wildlife habitat acres located within 300 feet of surface streams* in each subwatershed over the next 10 years (2015).	3a. 2004 Baseline Condition: 28,300 acres within 1,453 patches of forested wildlife habitat located within 300 feet of surface streams	Number and miles of all wildlife corridors Corridor quality: % of habitat acres within corridors with a vegetative

Performance Objectives	Targets	Targeted Condition Based on 2004 Metro Inventory	Example Indicators
habitat.		90% retention: 25,500 acres of forested wildlife habitat located within 300 feet of surface streams	width of 200 ft Acres of wildlife patches with a connectivity score of 3 or greater Acres and number of forested wildlife habitat patches (forest canopy or wetland with a total combined size greater than 2 acres) within 300 feet of surface streams compared to acres of the patches located outside of 300 feet of surface streams.

Performance Objectives	Targets	Targeted Condition Based on 2004 Metro Inventory	Example Indicators
Performance Objective 3 (continued):	3b. *Preserve 80% of non-forested wildlife habitat acres located within 300 feet of surface streams* in each subwatershed over the next 10 years (2015).	3b. 2004 Baseline Condition: 14,400 acres within 1,633 patches of non-forested wildlife habitat located within 300 feet of surface streams 80% retention: 11,500 acres of non-forested wildlife habitat located within 300 feet of surface streams	Acres and number of non-forested wildlife patches (shrub or low structure/open soils with a total combined size greater than 2 acres) located within 300 feet of a surface streams.
Performance Objective 4: Preserve and improve special habitats of concern.	4a. *Preserve 95% of habitats of concern acres* in each subwatershed over the next 10 years (2015).	4a. 2004 Baseline Condition: 33% of all habitat designated as HOCs 26,700 total acres of HOCs	Number of acres of wetland Number of acres of white oak woodland Number of acres of

Performance Objectives	Targets	Targeted Condition Based on 2004 Metro Inventory	Example Indicators
		95% retention: 25,400 total acres of HOCs	bottomland hardwood forest Number of acres of vegetated riverine islands Number of acres of key connector habitat (list out HOC connectors)
Implementation Objectives	Example Indicators		
Implementation Objective A: Increase the use of habitat-friendly development throughout the region	Number of jurisdictions that allow or require LID Number of jurisdictions providing LID incentives Percentage of region in forest canopy Percentage of impervious area B-IBI (benthic index of biological integrity) scores		

Performance Objectives	Targets	Targeted Condition Based on 2004 Metro Inventory	Example Indicators
Implementation Objective B: Increase restoration and mitigation actions to compensate of adverse effects of new and existing development on ecological function	Number of restoration projects in one year Number of mitigation projects in one year Acres and distribution by resource class of habitat inventory Number of culverts that need improvement Number of watersheds in region with adopted action plans		

(Ordinance 05-1077C, Sec. 5.)

TITLE 14: URBAN GROWTH BOUNDARY

3.07.1405 Purpose

The Regional Framework Plan (RFP) calls for a clear transition from rural to urban development, an adequate supply of urban land to accommodate long-term population and employment, and a compact urban form. Title 14 prescribes criteria and procedures for amendments to the urban growth boundary (UGB) to achieve these objectives.

(Ordinance 10-1244B, Sec. 12.)

3.07.1410 Urban Growth Boundary

(a) The UGB for the metropolitan area is incorporated into this title and is depicted on the Urban Growth Boundary and Urban and Rural Reserves Map. Cities and counties within the Metro boundary shall depict the portion of the UGB, if any, that lies within their boundaries on their comprehensive plan maps. Within 21 days after acknowledgment of an amendment to the UGB under this title, the COO shall submit the amended UGB to the city and county in which the amended UGB lies. The city and county shall amend their comprehensive plan maps to depict the amended UGB within one year following receipt of the amendment from the COO.

(b) Urban and Rural Reserves are depicted on the Urban Growth Boundary and Urban and Rural Reserves Map. Amendments to the UGB made pursuant to this title shall be based upon this map.

(Ordinance 10-1244B, Sec. 12. Ordinance 11-1264B, Sec. 3. Ordinance 15-1357.)

Title 14 Urban Growth Boundary Map as of October 29, 2014.

(Ordinance 14-1336.)

Title 14, Urban Growth Boundary

October 2014

0 1 2 4 miles

The information on this map was derived from digital databases on Metro's GIS. Care was taken in the creation of this map. Metro cannot accept any responsibility for errors, omissions, or positional accuracy. There are no warranties, expressed or implied, including the warranty of merchantability or fitness for a particular purpose, accompanying this product. However, notification of any errors are appreciated.

- County boundaries
- Urban growth boundaries
- Neighbor cities
- Rural reserve
- Urban reserve

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3.07.1420 Legislative Amendment to UGB - Procedures

(a) Legislative amendments follow periodic analysis of the capacity of the UGB and the need to amend it to accommodate long-range growth in population and employment. The Metro Council shall initiate a legislative amendment to the UGB when required by state law and may initiate a legislative amendment when it determines there is a need to add land to the UGB.

(b) Except as otherwise provided in this title, the Council shall make legislative amendments to the UGB by ordinance in the manner prescribed for ordinances in Chapter VII of the Metro Charter. For each legislative amendment, the Council shall establish a schedule of public hearings that allows for consideration of the proposed amendment by MPAC, other advisory committees and the general public.

(c) Notice to the public of a proposed legislative amendment of the UGB shall be provided as prescribed in section 3.07.1465.

(d) Prior to the final hearing on a proposed legislative amendment of the UGB in excess of 100 acres, the COO shall prepare a report on the effect of the proposed amendment on existing residential neighborhoods. The COO shall provide copies of the report to all households located within one mile of the proposed amendment area and to all cities and counties within the district at least 20 days prior to the hearing. The report shall address:

(1) Traffic patterns and any resulting increase in traffic congestion, commute times and air quality;

(2) Whether parks and open space protection in the area to be added will benefit existing residents of the district as well as future residents of the added territory; and

(3) The cost impacts on existing residents of providing needed public facilities and services, police and fire services, public schools, emergency services and parks and open spaces.

(Ordinance 10-1244B, Sec. 12.)

3.07.1425 Legislative Amendment to the UGB - Criteria

(a) This section sets forth the factors and criteria for amendment of the UGB from state law and the Regional Framework Plan. Compliance with this section shall constitute compliance with statewide planning Goal 14 (Urbanization) and the Regional Framework Plan.

(b) The Council shall determine whether there is a need to amend the UGB. In determining whether a need exists, the Council may specify characteristics, such as parcel size, topography or proximity, necessary for land to be suitable for an identified need. The Council's determination shall be based upon:

(1) Demonstrated need to accommodate future urban population, consistent with a 20-year population range forecast coordinated with affected local governments; and

(2) Demonstrated need for land suitable to accommodate housing, employment opportunities, livability or uses such as public facilities and services, schools, parks, open space, or any combination of the foregoing in this paragraph; and

(3) A demonstration that any need shown under paragraphs (1) and (2) of this subsection cannot reasonably be accommodated on land already inside the UGB.

(c) If the Council determines there is a need to amend the UGB, the Council shall evaluate areas designated urban reserve for possible addition to the UGB and shall determine which areas better meet the need considering the following factors:

(1) Efficient accommodation of identified land needs;

(2) Orderly and economic provision of public facilities and services;

(3) Comparative environmental, energy, economic and social consequences; and

(4) Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on land outside the UGB designated for agriculture or forestry pursuant to a statewide planning goal.

(5) Equitable and efficient distribution of housing and employment opportunities throughout the region;

(6) Contribution to the purposes of Centers and Corridors;

(7) Protection of farmland that is most important for the continuation of commercial agriculture in the region;

(8) Avoidance of conflict with regionally significant fish and wildlife habitat; and

(9) Clear transition between urban and rural lands, using natural and built features to mark the transition.

(d) The Council may consider land not designated urban or rural reserve for possible addition to the UGB only if it determines that:

(1) Land designated urban reserve cannot reasonably accommodate the need established pursuant to subsection (b) of this section; or

(2) The land is subject to a concept plan approved pursuant to section 3.07.1110 of this chapter, involves no more than 50 acres not designated urban or rural reserve and will help the concept plan area urbanize more efficiently and effectively.

(e) The Council may not add land designated rural reserve to the UGB.

(f) The Council may not amend the UGB in such a way that would create an island of urban land outside the UGB or an island of rural land inside the UGB.

(Ordinance 10-1244B, Sec. 12.)

3.07.1430 Major Amendments - Procedures

(a) A city, a county, a special district or a property owner may initiate a major amendment to the UGB by filing an application on a form provided by Metro. The COO will accept applications for major amendments between February 1 and March 15 of each calendar year except that calendar year in which the Council is completing its analysis of buildable land supply under ORS 197.299. Upon a request by a Metro Councilor and a finding of good cause, the Metro Council may accept an application at other times by a vote of five members of the Council.

(b) Except for that calendar year in which the Council is completing its analysis of buildable land supply, the COO shall give notice of the March 15 deadline for

applications for major amendments not less than 120 days before the deadline and again 90 days before the deadline in a newspaper of general circulation in Metro and in writing to each city and county in Metro and anyone who has requested notification. The notice shall explain the consequences of failure to file before the deadline and shall specify the Metro representative from whom additional information may be obtained.

(c) With the application, the applicant shall provide the names and addresses of property owners for notification purposes, consistent with section 3.07.1465. The list shall be certified as true and accurate as of the specified date by a title company, a county assessor or designate of the assessor or the applicant.

(d) The applicant shall provide a written statement from the governing body of each city or county with land use jurisdiction over the area and any special district that has an agreement with that city or county to provide an urban service to the area that it recommends approval or denial of the application. The Council may waive this requirement if the city, county or special district has a policy not to comment on major amendments, or has not adopted a position within 120 days after the applicant's request for the statement. The governing body of a local government may delegate the decision to its staff.

(e) The COO will determine whether an application is complete and will notify the applicant of the determination within seven working days after the filing of the application. The COO will dismiss an application and return application fees if a complete application is not received within the 14 days after the notice of incompleteness.

(f) Within 14 days after receipt of a complete application, the COO will:

1. Set the matter for a public hearing before a hearings officer for a date no later than 55 days following receipt of a complete application; and

2. Notify the public of the public hearing as prescribed in section 3.07.1465 of this title.

(g) The COO shall submit a report and recommendation on the application to the hearings officer not less than 15 days before the hearing and send copies to the applicant and others who have requested copies. Any subsequent report by the COO to be used at the hearing shall be

available to the public at least seven days prior to the hearing.

(h) If the proposed major amendment would add more than 100 acres to the UGB, the COO shall prepare a report on the effect of the proposed amendment on existing residential neighborhoods in the manner prescribed in subsection (d) of section 3.07.1420.

(i) An applicant may request postponement of the hearing within 20 days after filing a complete application. The COO may postpone the hearing for no more than 60 days. If the applicant fails to request rescheduling within 90 days after the request for postponement, the application shall be considered withdrawn and the COO will return the unneeded portion of the fee deposit assessed pursuant to section 3.07.1460.

(j) Participants at a hearing before a hearings officer need not be represented by an attorney. If a person wishes to represent an organization orally or in writing, the person must show the date of the meeting at which the organization adopted the position presented and authorized the person to represent it.

(k) Failure of the applicant to appear at the hearing shall be grounds for dismissal of the application unless the applicant requests a continuance prior to the hearing. The applicant has the burden of demonstrating that the proposed amendment complies with the criteria.

(l) The hearings officer shall provide the following information to participants at the beginning of the hearing:

The criteria applicable to major amendments and the procedures for the hearing;

(1) A statement that testimony and evidence must be directed toward the applicable criteria or other criteria the person believes apply to the proposal; and

(2) A statement that failure to raise an issue in a manner sufficient to afford the hearings officer and participants an opportunity to respond to the issue precludes appeal of that issue.

(m) The hearing shall be conducted in the following order:

(1) Presentation of the report and recommendation of the COO;

(2) Presentation of evidence and argument by the applicant;

(3) Presentation of evidence and argument in support of or opposition to the application by other participants; and

(4) Presentation of rebuttal evidence and argument by the applicant.

(n) The hearings officer may grant a request to continue the hearing or to leave the record open for presentation of additional evidence upon a demonstration that the evidence could not have been presented during the hearing. If the hearings officer grants a continuance, the hearing shall be continued to a date, time and place certain at least seven (7) days from the date of the initial evidentiary hearing. A reasonable opportunity shall be provided at the continued hearing for persons to present and rebut new evidence.

(o) If new evidence is submitted at the continued hearing, the hearings officer may grant a request, made prior to the conclusion of the continued hearing, to leave the record open to respond to the new evidence. If the hearings officer grants the request, the record shall be left open for at least seven (7) days. Any participant may respond to new evidence during the period the record is left open.

(p) Cross-examination by parties shall be by submission of written questions to the hearings officer, who shall give participants an opportunity to submit such questions prior to closing the hearing. The hearings officer may set reasonable time limits for oral testimony and may exclude or limit cumulative, repetitive, or immaterial testimony.

(q) A verbatim record shall be made of the hearing, but need not be transcribed unless necessary for appeal.

(r) The hearings officer may consolidate applications for hearing after consultation with Metro staff and applicants. If the applications are consolidated, the hearings officer shall prescribe rules to avoid duplication or inconsistent findings, protect the rights of all participants, and allocate the charges on the basis of cost incurred by each applicant.

(s) Within 15 days following the close of the record, the hearings officer shall submit a proposed order, with findings of fact and conclusions of law and the record

of the hearing, to the COO, who shall make it available for review by participants.

(t) Within seven (7) days after receipt of the proposed order from the hearings officer, the COO shall set the date and time for consideration of the proposed order by the Council, which date shall be no later than 40 days after receipt of the proposed order. The COO shall provide written notice of the Council meeting to the hearings officer and participants at the hearing before the hearings officer, and shall post notice of the hearing at Metro's website, at least 10 days prior to the meeting.

(u) The Council shall consider the hearings officer's report and recommendation at the meeting set by the COO. The Council will allow oral and written argument by those who participated in the hearing before the hearings officer. Argument must be based upon the record of those proceedings. Final Council action shall be as provided in section 2.05.045 of the Metro Code. The Council shall adopt the order, or ordinance if the Council decides to expand the UGB, within 15 days after the Council's consideration of the hearings officer's proposed order.

(Ordinance 10-1244B, Sec. 12.)

3.07.1435 Major Amendments – Expedited Procedures

(a) The COO may file an application at any time to add land to the UGB for industrial use, pursuant to section 3.07.460, by major amendment following the expedited procedures in this section. The application under this section remains subject to subsections (c), (d), (h), (m) and (q) of section 3.07.1430.

(b) Within 10 days after receipt of a complete application, the Council President will:

(1) Set the matter for a public hearing before the Council for a date no later than 55 days following receipt of a complete application; and

(2) Notify the public of the public hearing as prescribed in section 3.07.1465.

(c) The COO shall submit a report and recommendation on the application to the Council not less than 15 days before the hearing and send copies to those who have requested copies. Any subsequent report by the COO to be used at

the hearing shall be available to the public at least seven (7) days prior to the hearing.

(d) Participants at the hearing need not be represented by an attorney. If a person wishes to represent an organization orally or in writing, the person must show the date of the meeting at which the organization adopted the position presented and authorized the person to represent it.

(e) The Council President shall provide the following information to participants at the beginning of the hearing:

(1) The criteria applicable to major amendments and the procedures for the hearing;

(2) A statement that testimony and evidence must be directed toward the applicable criteria or other criteria the person believes apply to the proposal.

(f) The Council President may grant a request to continue the hearing or to leave the record open for presentation of additional evidence upon a demonstration that the evidence could not have been presented during the hearing. If the Council President grants a continuance, the hearing shall be continued to a date, time and place certain at least seven (7) days from the date of the initial evidentiary hearing. A reasonable opportunity shall be provided at the continued hearing for persons to present and rebut new evidence.

(g) If new evidence is submitted at the continued hearing, the Council President may grant a request, made prior to the conclusion of the continued hearing, to leave the record open to respond to the new evidence. If the Council President grants the request, the record shall be left open for at least seven (7) days. Any participant may respond to new evidence during the period the record is left open.

(h) The Council President may set reasonable time limits for oral testimony and may exclude or limit cumulative, repetitive, or immaterial testimony.

(i) Within 15 days following the close of the record, the Council shall adopt:

(1) An ordinance, with findings of fact and conclusions of law, that amends the UGB to add all or a portion of the territory described in the application; or

(2) A resolution adopting an order, with findings of fact and conclusions of law, that denies the application.

(Ordinance 10-1244B, Sec. 12.)

3.07.1440 Major Amendments - Criteria

(a) The purpose of the major amendment process is to provide a mechanism to address needs for land that cannot wait until the next analysis of buildable land supply under ORS 197.299. Land may be added to the UGB under sections 3.07.1430 and 3.07.1440 only for public facilities and services, public schools, natural areas and other non-housing needs and as part of a land trade under subsection (d). An applicant under section 3.07.1430 must demonstrate compliance with this purpose and these limitations.

(b) The applicant shall demonstrate that the proposed amendment to the UGB will provide for an orderly and efficient transition from rural to urban land use and complies with the criteria and factors in subsections (b), (c), (d), (e), and (f) of section 3.07.1425. The applicant shall also demonstrate that:

(1) The proposed uses of the subject land would be compatible, or through measures can be made compatible, with uses of adjacent land;

(2) If the amendment would add land for public school facilities, the coordination required by subsection (c)(5) of section 3.07.1120 of this chapter has been completed; and

(3) If the amendment would add land for industrial use pursuant to section 3.07.1435, a large site or sites cannot reasonably be created by land assembly or reclamation of a brownfield site.

(c) If the application was filed under section 3.07.1435, the applicant shall demonstrate that the amendment is consistent with any concept plan for the area developed pursuant to section 3.07.1110 of this chapter.

(d) To facilitate implementation of the Metropolitan Greenspaces Master Plan of 1992, the Council may add land to the UGB in a trade that removes a nearly equal amount of land from the UGB. If the Council designates

the land to be added for housing, it shall designate an appropriate average density per net developable acre.

(Ordinance 10-1244B, Sec. 12. Ordinance 15-1357.)

3.07.1445 Minor Adjustments - Procedures

(a) Minor adjustments make small changes to the UGB so that land within the UGB functions more efficiently and effectively. A city, a county, a special district, Metro or a property owner may initiate a minor adjustment to the UGB by filing an application on a form provided by Metro. The application shall include a list of the names and addresses of owners of property within 100 feet of the land involved in the application. The application shall also include the positions on the application of appropriate local governments and special districts, in the manner required by subsection (d) of section 3.07.1430.

(b) The COO will determine whether an application is complete and shall notify the applicant of the determination within ten working days after the filing of the application. If the application is not complete, the applicant shall complete it within 14 days of notice of incompleteness. The COO will dismiss an application and return application fees if a complete application is not received within 14 days of the notice of incompleteness.

(c) Notice to the public of a proposed minor adjustment of the UGB shall be provided as prescribed in section 3.07.1465.

(d) The COO shall review the application for compliance with the criteria in section 3.07.1450 and shall issue an order with analysis and conclusions within 90 days of receipt of a complete application. The COO shall send a copy of the order to the applicant, the city or county with jurisdiction over the land that is the subject of the application, to each member of the Council and any person who requests a copy.

(e) The applicant or any person who commented on the application may appeal the COO's order to the Council by filing an appeal on a form provided by Metro within 14 days after receipt of the order. A member of the Council may request in writing within 14 days of receipt of the order that the decision be reviewed by the Council. The Council shall consider the appeal or Councilor referral

at a public hearing held not more than 60 days following receipt of a timely appeal or referral.

(f) Notice to the public of a Council hearing on a proposed minor adjustment to the UGB shall be provided as prescribed in section 3.07.1465.

(g) Following the hearing, the Council shall uphold, deny or modify the COO's order. The Council shall issue an order with its analysis and conclusions and send a copy to the appellant, the city or county with jurisdiction over the land that is the subject of the application and any person who requests a copy.

(Ordinance 10-1244B, Sec. 12.)

3.07.1450 Minor Adjustments – Criteria

(a) The purpose of this section is to provide a mechanism to make small changes to the UGB in order to make land within it function more efficiently and effectively. It is not the purpose of this section to add land to the UGB to satisfy a need for housing or employment. This section establishes criteria that embody state law and Regional Framework Plan policies applicable to minor adjustments.

(b) Metro may adjust the UGB under this section only for the following reasons: (1) to site roads and lines for public facilities and services; (2) to trade land outside the UGB for land inside the UGB; or (3) to make the UGB coterminous with nearby property lines or natural or built features.

(c) To make a minor adjustment to site a public facility line or road, or to facilitate a trade, Metro shall find that:

(1) The adjustment will result in the addition to the UGB of no more than two net acres for a public facility line or road and no more than 20 net acres in a trade;

(2) Adjustment of the UGB will make the provision of public facilities and services easier or more efficient;

(3) Urbanization of the land added by the adjustment would have no more adverse environmental, energy, economic or social consequences than urbanization of land within the existing UGB;

(4) Urbanization of the land added by the adjustment would have no more adverse effect upon agriculture or forestry than urbanization of land within the existing UGB;

(5) The adjustment will help achieve the 2040 Growth Concept;

(6) The adjustment will not result in an island of urban land outside the UGB or an island of rural land inside the UGB; and

(7) If the adjustment is to facilitate a trade, the adjustment would not add land to the UGB that is designated rural reserve or for agriculture or forestry pursuant to a statewide planning goal.

(d) To approve a minor adjustment to make the UGB coterminous with property lines, natural or built features, Metro shall find that:

(1) The adjustment will result in the addition of no more than two net acres to the UGB;

(2) Urbanization of the land added by the adjustment would have no more adverse environmental, energy, economic or social consequences than urbanization of land within the existing UGB;

(3) Urbanization of the land added by the adjustment would have no more adverse effect upon agriculture or forestry than urbanization of land within the existing UGB;

(4) The adjustment will help achieve the 2040 Growth Concept; and

(5) The adjustment will not result in an island of urban land outside the UGB or an island of rural land inside the UGB.

(e) Where the UGB is intended to be coterminous with the 100-year floodplain, as indicated on the map of the UGB maintained by Metro's Data Resource Center, Metro may adjust the UGB in order to conform it to a more recent delineation of the floodplain. To approve such an adjustment, Metro shall find that:

(1) The delineation was done by a professional engineer registered by the State of Oregon;

(2) The adjustment will result in the addition of no more than 20 net acres to the UGB;

(3) The adjustment will help achieve the 2040 Growth Concept; and

(4) The adjustment will not result in an island of urban land outside the UGB or an island of rural land inside the UGB.

(f) If a minor adjustment adds more than two (2) acres of land available for housing to the UGB, Metro shall designate an appropriate average density per net developable acre for the area.

(g) The COO shall submit a report to the Council at the end of each calendar year with an analysis of all minor adjustments made during the year. The report shall demonstrate how the adjustments, when considered cumulatively, are consistent with and help achieve the 2040 Growth Concept.

(Ordinance 10-1244B, Sec. 12.)

3.07.1455 Conditions of Approval

(a) Land added to the UGB pursuant to sections 3.07.1420, 3.07.1430 and 3.07.1435 shall be subject to the requirements of sections 3.07.1120 and 3.07.1130 of this chapter.

(b) If the Council amends the UGB pursuant to sections 3.07.1420, 3.07.1430 or 3.07.1435, it shall:

(1) In consultation with affected local governments, designate the city or county responsible for adoption of amendments to comprehensive plans and land use regulations to allow urbanization of each area added to the UGB, pursuant to Title 11 of this chapter. If local governments have an agreement in a concept plan developed pursuant to Title 11 that establishes responsibility for adoption of amendments to comprehensive plans and land use regulations for the area, the Council shall assign responsibility according to the agreement.

(2) Establish the 2040 Growth Concept design type designations applicable to the land added to the UGB, including the specific land need, if any, that is the basis for the amendment. If the design type designation authorizes housing, the Council shall designate an appropriate average density per net developable acre consistent with the need for which the UGB is expanded.

(3) Establish the boundaries of the area that shall be included in the planning required by Title 11. A planning area boundary may include territory designated urban reserve, outside the UGB.

(4) Establish the time period for city or county compliance with the requirements of Title 11, which shall be two (2) years following the effective date of the ordinance adding the area to the UGB unless otherwise specified.

(c) If the Council amends the UGB pursuant to any of the sections of this title, it may establish other conditions it deems necessary to ensure the addition of land complies with state planning laws and the Regional Framework Plan. If a city or county fails to satisfy a condition, the Council may enforce the condition after following the notice and hearing process set forth in section 3.07.850 of this chapter.

(Ordinance 10-1244B, Sec. 12. Ordinance 15-1357.)

3.07.1460 Fees

(a) Each application submitted by a property owner or group of property owners pursuant to this title shall be accompanied by a filing fee in an amount to be established by the Council. Such fee shall not exceed Metro's actual cost to process an application. The fee may include administrative costs, the cost of a hearings officer and of public notice.

(b) The fee for costs shall be charged from the time an application is filed through mailing of the notice of adoption or denial to the Department of Land Conservation and Development and other interested persons.

(c) Before a hearing is scheduled, an applicant shall submit a fee deposit. In the case of an application for a minor adjustment pursuant to section 3.07.1445, the applicant shall submit the fee deposit with the application.

(d) The unexpended portion of an applicant's deposit, if any, shall be returned to the applicant at the time of final disposition of the application. If hearings costs exceed the amount of the deposit, the applicant shall pay to Metro an amount equal to the costs in excess of the deposit prior to final action by the Council.

(e) The Council may, by resolution, reduce, refund or waive the fee, or portion thereof, if it finds that the fee would create an undue hardship for the applicant.

(Ordinance 10-1244B, Sec. 12.)

3.07.1465 Notice Requirements

(a) For a proposed legislative amendment under section 3.07.1420, the COO shall provide notice of the public hearing in the following manner:

(1) In writing to the Department of Land Conservation and Development and local governments of the Metro region at least 35 days before the first public hearing on the proposal; and

(2) To the general public at least 35 days before the first public hearing by an advertisement no smaller than 1/8-page in a newspaper of general circulation in the Metro area and by posting notice on the Metro website.

(b) For a proposed major amendment under sections 3.07.1430 or 3.07.1435, the COO shall provide notice of the hearing in the following manner:

(1) In writing at least 35 days before the first public hearing on the proposal to:

(A) The applicant;

(B) The director of the Department of Land Conservation and Development;

(C) The owners of property that is being considered for addition to the UGB; and

(D) The owners of property within 250 feet of property that is being considered for addition to the UGB, or within 500 feet of the property if it is designated for agriculture or forestry pursuant to a statewide planning goal;

(2) In writing at least 30 days before the first public hearing on the proposal to:

(A) The local governments of the Metro area;

(B) A neighborhood association, community planning organization, or other organization for citizen involvement whose geographic area of interest includes or is adjacent to the

subject property and which is officially recognized as entitled to participate in land use decisions by the cities and counties whose jurisdictional boundaries include or are adjacent to the site, and to any other person who requests notice of amendments to the UGB; and

(3) To the general public by posting notice on the Metro website at least 30 days before the first public hearing on the proposal.

(c) The notice required by subsections (a) and (b) of this section shall include:

(1) A map showing the location of the area subject to the proposed amendment;

(2) The time, date and place of the hearing;

(3) A description of the property reasonably calculated to give notice as to its actual location, with street address or other easily understood geographical reference if available;

(4) A statement that interested persons may testify and submit written comments at the hearing;

(5) The name of the Metro staff to contact and telephone number for more information;

(6) A statement that a copy of the written report and recommendation of the COO on the proposed amendment will be available at reasonable cost 20 days prior to the hearing; and

(7) A general explanation of the criteria for the amendment, the requirements for submission of testimony and the procedure for conduct of hearings;

(8) For proposed major amendments only:

(A) An explanation of the proposed boundary change;

(B) A list of the applicable criteria for the proposal; and

(C) A statement that failure to raise an issue at the hearing, orally or in writing, or failure to provide sufficient specificity to afford the decision maker an opportunity to respond

to the issue precludes an appeal based on the issue.

(9) For the owners of property described in subsection (b)(1)(C) of this section, the information required by ORS 268.393(3).

(d) For a proposed minor adjustment under section 3.07.1445, the COO shall provide notice in the following manner:

(1) In writing to the director of the Department of Land Conservation and Development at least 35 days before the issuance of an order on the proposal;

(2) In writing at least 20 days before the issuance of an order on the proposal to:

(A) The applicant and the owners of property subject to the proposed adjustment;

(B) The owners of property within 500 feet of the property subject to the proposed adjustment;

(C) The local governments in whose planning jurisdiction the subject property lies or whose planning jurisdiction lies adjacent to the subject property;

(D) Any neighborhood association, community planning organization, or other organization for citizen involvement whose geographic area of interest includes the area subject to the proposed amendment and which is officially recognized as entitled to participate in land use decisions by the city or county whose jurisdictional boundary includes the subject property; and

(E) Any other person requesting notification of UGB changes.

(e) The notice required by subsection (d) of this section shall include:

(1) A map showing the location of the area subject to the proposed amendment;

(2) A description of the property reasonably calculated to give notice as to its actual location, with street address or other easily understood geographical reference if available;

(3) A statement that interested persons may submit written comments and the deadline for the comments;

(4) The name of the Metro staff to contact and telephone number for more information; and

(5) A list of the applicable criteria for the proposal.

(f) The COO shall notify each county and city in the district of each amendment of the UGB.

(Ordinance 10-1244B, Sec. 12. Ordinance 15-1357.)

ADOPTED PLAN AMENDMENT

Adopted Auto # : 9158
Jurisdiction Abb. : COREGO
DLCD File # : 010-99
Additional Proposal. File : N
Date Adoption Received : 10/14/1999
Date Adoption Notice Sent : 10/19/1999
Date Adopted: 10/6/1999
Appeal Deadline : 11/2/1999
Appeal Filed :
LUBA No. :
Appeal Decision :

Proposed PA Auto # : 9962
JURISDICTION : OREGON CITY
LOCAL FILE # : PZ98-04
Proposed : Y
Total Time Spent on Review : 1.50
Date Letter Sent on Proposal : YES

Amend the comprehensive plan and the Municipal Code to (1) include "Landslides, Weak Foundation Soils and Erosion" in the Natural Resources Element Section; (2) Implement the requirements of Title 3 of the Urban Growth Mangement Functional Plan; (3) Adopt the Metro Water Quality and Flood Management Areas Model Ordinance and Map into Title 17 of the City Code; and (4) Adopt the draft of Local Wetland Inventory and Riparian Assessment.

Amendment Type : B M = Map; T = Text; B = Both

AREAPLAN PE.GOAL5 PLANMAP GOAL5.INV
NEW.ZONE ZONEMAP

Location : CITY WIDE.
# of Areas : 5.00 Original Use CITY New Use UOVER Acres
CITY NATRES
CITY FLP
CITY

Description:

SAME.

Locally Identified Agencies Army Corps of Engineers, Oregon Division of State Lands.

DATE PROPOSAL RECEIVED : 5/17/1999
FIRST EVIDENTIARY HEARING DATE :
FINAL HEARING DATE : 7/6/1999
DAYS NOTICE OF EVID. HEARING:
DAYS NOTICE : 50
LOCAL GOV CONTACT : Nancy Krashaar
CONTACT PHONE # : 503-657-0891 EXT:
DATE PRO. NOTICE SENT :
NUMBER OF AMEND :

PROPOSAL REVIEW

PART. NOTICE SENT : DEPT. PART. : YA

Goals:

ASREVIEWER : MF ASREVIEWER2 : AB TIME SPENT ON REVIEW : 1.50
FINAL DATE :06/11 MAIL DATE : 06/14 FAX DATE :06/21
RESPONSE SENT : YES ASSUPERVISOR : ASRESPONSE : lETTER

DLCD PLAN AMENDMENT ADOPTION WORKSHEET

ADOPTED AUTO #: 9158 **JURISDICTION:** City of Oregon City

PLAN AMEND AUTO/TRACK SHEET #: 9962 **OTHER PLAN AMEND (Y or N):** N

DLCD # : 010-99 **PROPOSED AMENDMENT(Y OR N):** Y

DLCD DATE RECEIVED: 10/14/99 **ADOPTION NOTICE SENT DATE:** 10/19/99

DATE OF ADOPTION: 10/06/99 **APPEAL DEADLINE DATE:** 11/02/99
(21 days from postmark date)

ADOPTED TEXT: Same

CHANGE FROM PROPOSED : YES ___ **NO:** X **ADOPTED STATUS: FULL** X **PART** ___

POSTMARK DATE: 10/12/99 **(FOR THE ORIGINAL ENVELOPE - SEE BELOW)**

(see file #: _____ **)**

DLCD MAIL DATE: 10/21/99 **(see jurisdiction:** _____ **)**
(5 Working Days from Date Received)

ada	X	**adoptnote.a**	45 day notice given
adb		**adoptnote.b**	no notice given
adc		**adoptnote.c**	no notice-/emergency circumstances
adcc		**adoptnote.cc**	no-/goals do not apply
add		**adoptnote.d**	less than 45 day notice
ade		**adoptnote.e**	less than 45 days/emergency circumstance
adee		**adoptnote.ee**	less than 45 days/goals do not apply
adf	X	**adoptnote.f**	maximum 75 pg's/ to bulky to mail
adg		**adoptnote.g**	no text or signed ordinance

PARTICIPATION DECISION & CODE TO USE ON THE ADOPTION NOTICE

n	= no participation	**chg**	= if different from proposed material
	= participated, but not sure if letter was written	**ya**	= participated in an advisory fashion, but not sure if letter was written
y1	= participated and we wrote a letter	**ya1**	= participated advisory and wrote letter
y/ph	= participated with a phone call	**ya/ph**	= we participated with a phone call
y/	= participated with no comment	**ya/**	= participated in advisory and no comment
Leave BLANK =	if no proposal had been sent prior to Adoption	**z**	= not yet decided

CC's : MF, AB, JH

Oregon
John A. Kitzhaber, M.D., Governor

Department of Land Conservation and Development
635 Capitol St. NE, Suite 200
Salem, Oregon 97301-2540
Phone (503) 373-0050
Director's Fax (503) 378-5518
Main Fax (503) 378-6033
Rural/Coastal Fax (503) 378-5518
TGM/Urban Fax (503) 378-2687
Web Address: http://www.lcd.state.or.us

NOTICE OF ADOPTED AMENDMENT

October 19, 1999

TO: Subscribers to Notice of Adopted Plan or Land Use Regulation Amendments

FROM: Plan Amendment Program Specialist

SUBJECT: City of Oregon City Plan Amendment
DLCD File # 010-99

The Department of Land Conservation and Development (DLCD) received the attached notice of adoption. A copy of the adopted plan amendment is available for review at the DLCD office in Salem and the local government office. Due to the size of amended material submitted, a complete copy has not been attached.

Appeal Procedures*

DLCD DEADLINE TO APPEAL: November 2, 1999.

This amendment was submitted to DLCD for review 45 days prior to adoption. Pursuant to ORS 197.830 (2)(b) only persons who participated in the local government proceedings leading to adoption of the amendment are eligible to appeal this decision to the Land Use Board of Appeals (LUBA).

If you wish to appeal, you must file a notice of intent to appeal with the Land Use Board of Appeals (LUBA) no later than 21 days from the date the decision was mailed to you by the local government. If you have questions, check with the local government to determine the appeal deadline. Copies of the notice of intent to appeal must be served upon the local government and others who received written notice of the final decision from the local government. The notice of intent to appeal must be served and filed in the form and manner prescribed by LUBA, (OAR Chapter 661, Division 10). Please call LUBA (373-1265) if you have questions about appeal procedures.

*NOTE: THE APPEAL DEADLINE IS BASED UPON THE DATE THE DECISION WAS MAILED BY LOCAL GOVERNMENT. A DECISION MAY HAVE BEEN MAILED TO YOU ON A DIFFERENT DATE THAN IT WAS MAILED TO DLCD. AS A RESULT YOUR APPEAL DEADLINE MAY BE EARLIER THAN THE DATE SPECIFIED ABOVE.

cc: Jim Hinman, Urban Coordinator
Meg Fernekees, Regional Representative
Ann Beier, State Floodplain Program Manager
<paa> yl

FORM 2

D L C D NOTICE OF ADOPTION

DEPT OF
OCT 14 1999
LAND CONSERVATION
AND DEVELOPMENT

This form **must be mailed** to DLCD **within 5 working days after the final decision**
per ORS 197.610, OAR Chapter 660 - Division 18

(See reverse side for submittal requirements)

Jurisdiction: City of Oregon City Local File No.: Ordinance No. 99-1013 with Exhibits A, B, C, and D PZ 98-04
(If no number, use none)

Date of Adoption: October 6, 1999 Date Mailed: October 11 1999
(Must be filled in) (Date mailed or sent to DLCD)

Date the Notice of Proposed Amendment was mailed to DLCD: July 7, 1999

X Comprehensive Plan Text Amendment
X Comprehensive Plan Map Amendment
X Land Use Regulation Amendment
X Zoning Map Amendment
___ New Land Use Regulation
___ Other: _____
(Please Specify Type of Action)

Summarize the adopted amendment. Do not use technical terms. Do not write "See Attached."

SEE OVER

Describe how the adopted amendment differs from the proposed amendment. If it is the same, write "Same." If you did not give notice for the proposed amendment, write "N/A."

SEE OVER

Plan Map Changed from: _____ to Added Land to Flood Management Area

Zone Map Changed from: _____ to Added land to Water Quality Resource Area Overlay District

Location: Oregon City Acres Involved: —

Specify Density: Previous: n/a New: n/a

Applicable Statewide Planning Goals: 6 + 7

Was an Exception Adopted? Yes: ____ No: X

DLCD File No.: 010-99 (9962)

RESPONSES TO DIRECTIONS ON COVER PAGE OF DLCD NOTICE OF ADOPTION:

Summarize the adopted amendment. Do not use technical terms. Do not write "See Attached."

Ordinance #99-1013 implements the requirements of *Title 3: Water Quality and Flood Management Conservation* of the Urban Growth Management Functional Plan that focuses on flooding and water quality. Relative to flooding, the ordinance is intended to protect life and property from natural disasters and hazards. Relative to water quality, the ordinance is intended to protect, maintain, and improve the beneficial uses of rivers and streams. The adopted ordinance adopts comprehensive plan and municipal code text amendments, a Water Quality and Flood Management Areas map, an updated Local Wetland Inventory, and the Oregon City Public Works Standards for Erosion and Sediment Control.

Describe how the adopted amendment differs from the proposed amendment. If it is the same, write "Same." If you did not give notice for the proposed amendment, write "N/A."

1. The proposed amendment provided protection for Primary and Secondary Protected Water Features. The adopted ordinance combined the two types in to one category: Protected Water Features.
2. The proposed amendment required vegetative corridors for intermittent streams draining 50 to 100 acres. The adopted ordinance requires vegetative corridors for intermittent streams regardless of drainage area. 15-foot corridors are required for intermittent streams draining less than 100 acres and with bank slopes less than 25 percent. If the drainage area is greater than 100 acres or slopes are greater than 25 percent, vegetative corridors width ranges from 50 to 200 feet.
3. The definition of a stream was revised to clarify what streams are protected by the ordinance. The selected definition (from OAR 350-110-0040, Rules of Columbia River Gorge Commission) best captures the City's intent and is generally consistent with other definitions and is applicable to land use matters.
4. Findings were added to the adopted ordinance text to clarify the City's ability to supply buildable lands for housing opportunities.
5. Supplemental findings were added to the adopted ordinance as Exhibit D that clarify the applicability of the ordinance relative to Statewide Planning Goals 5, 6, and 7.
6. The proposed Water Quality and Flood Management Areas Map was changed to depict a *Water Quality Resource Area Overlay District* rather than only showing potential Protected Water Features and Water Quality Resource Areas. The overlay district was added to provide clear and objective standards for development applications. The proposed Water Quality and Flood Management Areas Map was changed to depict *Flood Management Overlay Districts* rather than showing the boundaries of the FEMA 100-year flood plain and February 1996 Flood.
7. The proposed Oregon City Public Works Standards for Erosion and Sediment Control were revised. The adopted ordinance includes an updated set of Best Management Practices.
8. Minor revisions were made to ensure language consistency and to correct previous typographic errors.

17.49.100 Consistency. Where the provisions of this chapter are less restrictive or conflict with comparable provisions of the zoning ordinance, regional, state or federal law, the provisions that are more restrictive shall govern. Where this document imposes restrictions that are more stringent than regional, state and federal law, the provisions of this document shall govern.

17.49.110 Severability. The provisions of this chapter are severable. If any section, clause or phrase of this chapter is adjudged to be invalid by a court of competent jurisdiction, the decision of that court shall not affect the validity of the remaining portions of this ordinance.

Section 11. Emergency clause. Because this ordinance is necessary for the preservation of the peace, public health, safety and welfare of Oregon City and to provide for an orderly transition in a reasonable time to the regulatory system, an emergency is hereby declared to exist and this ordinance shall be in full force and effect from the time of passage by the Commission.

Read for the first time at a regular meeting of the City Commission held on the 6th day of October, 1999, and the foregoing ordinance was finally enacted by the Commission this 6th day of October, 1999.

Jean K. Elliott
JEAN K. ELLIOTT, City Recorder

ATTESTED to this 6th day of October, 1999.

John F. Williams, Jr.
JOHN F. WILLIAMS, Jr., Mayor

Note: Ordinance includes Exhibit A, Exhibit B, Exhibit C, Exhibit D

Exhibit A: Water Quality and Flood Mgt. Areas Map

Exhibit B: Local Wetland Inventory and Riparian Assessment

Exhibit C: Public Works Standards for Erosion and Seaiment Control

Exhibit D: Supplemental Findings and Conclusions – Ordinance No. 99-1013

ORDINANCE NO. 99-1013

Effective Date: October 6, 1999

2. The City shall amend the Water Quality and Flood Management Areas Map if the information demonstrates:
   a. That a Protected Water Feature no longer exists because the area has been legally filled, culverted or developed prior to the adoption of the amendment of Title 3 of the Functional Plan (June 18, 1998); or
   b. That the Protected Water Feature does not exist or is outside the Water Quality Resource Area Overlay District.

C. Modification of the Water Quality Resource Area Overlay District

To modify the Water Quality Resource Area Overlay District, the applicant shall demonstrate that the modification will offer the same or better protection of the Protected Water Feature and Water Quality Resource Area by:

1. Preserving a vegetated corridor that will separate the Protected Water Feature from proposed development; and

2. Preserving existing vegetated cover or enhancing the Water Quality Resource Area sufficient to assist in maintaining or reducing water temperatures in the adjacent Protected Water Feature; and

3. Enhancing the Water Quality Resource Area sufficient to minimize erosion, nutrient and pollutant loading into the adjacent Protected Water Feature; and

4. Protecting the vegetated corridor sufficient to provide filtration, infiltration and natural water purification for the adjacent Protected Water Feature; and

5. Stabilizing slopes adjacent to the Protected Water Feature.

D. Adding Title 3 Wetlands

1. Within 90 days of receiving evidence that a wetland meets any of one of the criteria in this Section, the City shall provide notice to interested parties of a public hearing at which the City will review the evidence.
2. A wetland and its vegetated corridor shall be included in the Water Quality Resource Area Overlay District if the wetland meets any one of the following criteria:
   a. The wetland is fed by surface flows, sheet flows or precipitation, and has evidence of flooding during the growing season, and has 60 percent or greater vegetated cover, and is over one-quarter acre in size;
   or the wetland qualifies as having "intact water quality function" under the 1996 Oregon Freshwater Wetland Assessment Methodology; or
   b. The wetland is in the Flood Management Area, and has evidence of flooding during the growing season, and is five acres or more in size, and has a restricted outlet or no outlet;
   or the wetland qualifies as having "intact hydrologic control function" under the 1996 Oregon Freshwater Wetland Assessment Methodology; or
   c. The wetland or a portion of the wetland is within a horizontal distance of less than one-fourth mile from a water body which meets the Department of Environmental Quality definition of "water quality limited water body" in OAR Chapter 340, Division 41 (1996).

D. Hardship Variance

Variances to avoid unreasonable hardship caused by the strict application of this chapter are permitted subject to the criteria set forth in this section. To vary from the requirements of this chapter, the applicant must demonstrate the following:

1. The variance is the minimum necessary to allow the proposed use or activity;
2. The variance does not increase danger to life and property due to flooding or erosion;
3. Unless the proposed variance is from Section 17.49.050(G)(12) (mitigation), the proposed use will comply with those standards; and
4. The proposed use complies with the standards of the base zone and other applicable overlay districts.

E. Buildable Lot Variance

A variance to avoid the loss of all economically viable use of a lot that is partially inside the Water Quality Resource Area is permitted. Development on such lots shall not disturb more than 5,000 square feet of the vegetated corridor. Applicants must demonstrate the following:

1. Without the proposed variance, the applicant would be denied economically viable use of the subject property. To meet this criterion, the applicant must show that:
   a. The proposed use cannot meet the standards in Section 17.49.080(D) (hardship variance); and
   b. No other application could result in permission for an economically viable use of the subject property. Evidence to meet this criterion shall include a list of uses allowed on the subject property.
2. The proposed variance is the minimum necessary to allow for the requested use;
3. The proposed variance will comply with Section 17.49.050(G)(12) (mitigation); and
4. The proposed use complies with the standards of the base zone and other applicable overlay districts.

F. Variance Conditions

The Planning Commission may impose such conditions as are deemed necessary to limit any adverse impacts that may result from granting relief. If a variance is granted pursuant to subsections 17.49.080(D), the variance shall be subject to the following conditions:

1. The minimum width of the vegetated corridor shall be 15 feet on each side of a Protected Water Feature, except as allowed in Section 17.49.080(E);
2. At least 75 percent of the length of the Water Quality Resource Area for a Protected Water Feature within a development site shall be greater than 30 feet in width on each side of the water feature.

17.49.090 Map Administration.

A. The purpose of this section is to provide a process for amending the Water Quality and Flood Management Areas Map to add wetlands and correct the location of Protected Water Features and the Water Quality Resource Area Overlay District if the Protected Water Feature does not exist or is outside the Water Quality Resource Area Overlay District. The information used to establish an error shall include a topographic map of the site with contour intervals no greater than 5 feet and a report qualifying the map amendment prepared by a registered professional engineer licensed by the State of Oregon or a qualified wetland specialist.

B. Map Corrections shall be processed pursuant to the requirements of Chapter 17.68.

1. Within 90 days of receiving information establishing an error in the existence or location of a Protected Water Feature, the City shall provide notice to interested parties of a public hearing at which the City will review the information.

3. At the owner's option, public open space where the tract has been dedicated to the City or other governmental unit; or
4. Any other ownership proposed by the owner and approved by the City Manager.

17.49.070 Density Transfers.

A. The purpose of this section is to allow density accruing to portions of a property within the Water Quality Resource Area to be transferred outside the Water Quality Resource Area.

B. Development applications for subdivisions that request a density transfer shall be proposed as part of a Planned Unit Development and shall comply with chapter 17.64, Planned Unit Development.

C. Development applications for partitions that request a density transfer shall:
1. Provide a map showing the net buildable area to which the density will be transferred.
2. Provide calculations justifying the requested density increase.
3. Demonstrate that the minimum lot size requirements can be met based on an average of all lots created, including the Water Quality Resource Area tract created pursuant to 17.49.060, and that no residential lot created is less than 5000 sq. ft.
4. Demonstrate that, with the exception of the Water Quality Resource Area parcel created pursuant to 17.49.060, no parcels have been created which would be unbuildable in terms of minimum yard setbacks.
5. Meet all other standards of the base zone.

D. The area of land contained in a Water Quality Resource Area may be excluded from the calculations for determining compliance with minimum density requirements of the zoning code.

17.49.080 Variances.

A. The purpose of this Section is to ensure that compliance with this chapter does not cause unreasonable hardship. To avoid such instances, the requirements of this chapter may be varied. Variances are also allowed when strict application of this chapter would deprive an owner of all economically viable use of land.

B. This Section applies to requests to vary from the standards of Chapter 17.49 only. Requests to vary from other standards of Title 17 shall be subject to the requirements of Chapter 17.60.
1. Variance applications made pursuant to this section shall follow the variance procedures outlined in 17.60.
2. In addition to the public notice requirements outlined in 17.50.090, Metro shall be notified within 14 days of the City receiving an application to vary the requirements of this section and within 14 days of a decision on the variance.
3. The requirements of Section 17.60.020 (Variances -- Grounds) do not apply to requests to vary from the standards of Chapter 17.49.
4. If an application to vary from the standards of Chapter 17.49 is made in conjunction with an application to vary from other standards of Title 17, the variances may be processed as one application provided the standards applicable to each variance requested must be met before the requested variance may be granted.

C. Development may occur on lots located completely within the Water Quality Resource Area that are recorded with the county assessor's office on or before the date this chapter is adopted. Development shall not disturb more than 5,000 square feet of the vegetated corridor, including access roads and driveways, subject to the erosion and sediment control standards of this document.

I. Vegetated Corridor Width Reduction.
A reduction in the width of the vegetated corridor required by Table 1 may be allowed as part of a Type III proceeding under the following conditions:

1. On slopes that are greater than or equal to 25% for less than 150 feet, a maximum reduction of 25 feet may be permitted in the width of vegetated corridor beyond the slope break if a geotechnical report demonstrates that the slope is stable.

2. On an anadromous fish-bearing stream, the 200 foot vegetated corridor may be reduced if the following criteria are met:

   a. The existing condition of the vegetated corridor is primarily developed with commercial, industrial or residential uses or is significantly degraded with less than 25% vegetative cover;
   b. A decrease is necessary to accomplish the purposes of the proposal and no practicable alternative is available;
   c. Decreasing the width of the vegetated corridor will not adversely affect the water resource functional values. The functional values of a water resource include, but are not limited to, the following: water quality protection and enhancement; fish and wildlife habitat; food chain support; flood storage, conveyance and attenuation; groundwater recharge and discharge; erosion control; historical and archaeological and aesthetic value; and recreation;
   d. Improvements will be made to the remaining vegetated corridor pursuant to the mitigation requirements of the section on Degraded Existing Vegetation Corridor in Table 2 of this chapter. The applicant must demonstrate that the improvements will increase the functional values of the water resource.
   e. A proposal to enhance a vegetated corridor shall not be used as justification to reduce an otherwise functional standard corridor width.
   f. In no case may the reduced corridor be less than otherwise would be required by Table 1 for a non-anadromous fish-bearing stream.

17.49.060 Subdivisions and Partitions.

A. The purpose of this section is to amend the City regulations governing land divisions to require that new subdivision and partition plats delineate and show the Water Quality Resource Area as either a separate tract or part of a larger tract that meets the requirements of 17.49.060 (D).

B. The standards for land divisions in a Water Quality Resource Area Overlay District shall apply in addition to the requirements of the City land division ordinance and zoning ordinance, provided that for partitions the minimum lot area, minimum average lot width, and minimum average lot depth standards of the base zone may be superseded in order to allow for a transfer of density pursuant to 17.49.070.

C. Prior to preliminary plat approval, the Water Quality Resource Area shall be shown either as a separate tract or part of a larger tract that meets the requirements of 17.49.060 (D), which shall not be a part of any parcel used for construction of a dwelling unit.

D. Prior to final plat approval, ownership of the Water Quality Resource Area tract shall be identified to distinguish it from lots intended for sale. The tract may be identified as any one of the following:
   1. Private open space held by the owner or a homeowners association; or
   2. For residential land divisions, private open space subject to an easement conveying storm and surface water management rights to the City and preventing the owner of the tract from activities and uses inconsistent with the purpose of this document; or

TABLE 2
Water Quality Resource Area Mitigation Requirements

Existing Condition Of Water Quality Resource Area	Mitigation Requirements
Good Existing Corridor: Combination of trees, shrubs and groundcover are 80% present, and there is more than 50% tree canopy coverage in the vegetated corridor.	1. Prior to construction, a biologist or landscape architect shall prepare and submit an inventory of vegetation in areas proposed to be disturbed and a plan for mitigating water quality impacts related to the development, including: sediments, temperature nutrients, sediment control, temperature control, or addressing any other condition that may have caused the Protected Water Feature to be listed on DEQ's 303 (d) list. 2. Inventory and remove debris and noxious materials.
Marginal Existing Vegetated Corridor: Combination of trees, shrubs and groundcover are 80% present, and 25-50 percent canopy coverage in the vegetated corridor.	1. Restore and mitigate according to approved plan using non-nuisance plantings from Native Plants List. 2. Inventory and remove debris and noxious materials. 3. Vegetate disturbed and bare areas with non-nuisance plantings from the Oregon City Native Plant List. 4. Revegetate with native species using a City approved plan developed to represent the vegetative composition that would naturally occur on the site. Seeding may be required prior to establishing plants for site stabilization. 5. Revegetation must occur during the next planting season following site disturbance. Annual replacement of plants that do not survive is required until vegetation representative of natural conditions is established on the site.
Degraded Existing Vegetated Corridor: Less vegetation and canopy coverage than Marginal Vegetated Corridors, and/or Greater than 10% surface coverage of any non-native species	1. Restore and mitigate according to approved plan using non-nuisance plantings from the Oregon City Native Plant List. 2. Inventory and remove debris and noxious materials. 3. Remove non-native species and revegetate with non-nuisance plantings from the Oregon City Native Plant List. 4. Vegetate disturbed and bare areas with appropriate plants from the Oregon City Native Plant List. 5. Plant and seed to provide 100 percent surface coverage.

6. Stormwater quantity control and quality control facilities:
   a. Except for flood control facilities designated by adopted Oregon City stormwater master plans, the stormwater quantity control and quality control facility may encroach a maximum of 25 feet into the outside boundary of the Water Quality Resource Area of a Protected Water Feature, (maximum allowable encroachment to be proportionally reduced for applicable intermittent stream vegetated corridor;
   b. The area of encroachment must be replaced by adding an equal area to the Water Quality Resource Area on the subject property; and
   c. All stormwater shall be collected on-site and passed through a treatment facility, such as a detention/composting facility or filter as approved by the city engineer in consultation with planning staff, prior to being discharged into the Water Quality Resource area.
   d. The Water Quality Resource Area shall not be subject to a significant negative impact as a result of changes to existing hydrologic connections.
7. Additions, alterations, rehabilitation and replacement of lawful structures.
   a. For existing structures, roadways, driveways, accessory uses and development which are nonconforming, this chapter shall apply in addition to the nonconforming use regulations of this title (Chapter 17.58).
   b. Additions, alterations, rehabilitation or replacement of existing structures, roadways, driveways, accessory uses and development shall not encroach closer to and will have no greater material adverse impact on the Protected Water Feature than the existing structures, roadways, driveways, accessory uses and development.
8. Off-site Mitigation:
   a. Where the alternatives analysis demonstrates that there are no practicable alternatives for mitigation on site, off-site mitigation shall be located as follows:
      (1) As close to the development as is practicable above the confluence of the next downstream tributary, or if this is not practicable;
      (2) Within the watershed where the development will take place or as otherwise specified by the City in an approved Wetland Mitigation Bank.
   b. In order to ensure that the mitigation area will be protected in perpetuity, proof that a deed restriction has been placed on the property where the mitigation is to occur is required.

FOR TABLE 2 REFER TO NEXT PAGE

(3) Provide mitigation to ensure that impacts to the functions and values of the Water Quality Resource Area will be mitigated or restored to the extent practicable.

12. A Water Quality Resource Area Mitigation Plan shall be prepared by a registered professional engineer, landscape architect, biologist, or other person trained or certified to determine that the vegetated corridor meets the requirements of Table 2 and shall contain the following information:
    a. A description of adverse impacts that will be caused as a result of development.
    b. An explanation of how adverse impacts to resource areas will be avoided, minimized, and/or mitigated in accordance with, but not limited to, Table 2.
    c. A list of all responsible parties including, but not limited to, the owner, applicant, contractor or other persons responsible for work on the development site.
    d. A map showing where the specific mitigation activities will occur.
    e. A maintenance program assuring plant survival for a minimum of three years.
    f. An implementation schedule, including timeline for construction, mitigation, mitigation maintenance, monitoring, reporting and a contingency plan. All in-stream work in anadromous fish-bearing streams shall be done in accordance with the Oregon Department of Fish and Wildlife in-stream timing schedule.

H. Development Standards

Applications for Provisional Uses in the Water Quality Resource Area shall satisfy the following standards:

1. The Water Quality Resource Area shall be restored and maintained in accordance with the mitigation plan and the specifications in Table 2.
2. Existing vegetation shall be protected and left in place. Work areas shall be carefully located and marked to reduce potential damage to the Water Quality Resource Area. Trees in the Water Quality Resource Area shall not be used as anchors for stabilizing construction equipment.
3. Where existing vegetation has been removed, or the original land contours disturbed, the site shall be revegetated during the next planting season. Nuisance plants, as identified in the Oregon City Nuisance Plant List, may be removed at any time. Interim erosion control measures such as mulching shall be used to avoid erosion on bare areas. Removed nuisance plants shall be replaced with plants from Oregon City's Native Plant List by the next planting season.
4. Prior to construction, the Water Quality Resource Area shall be flagged, fenced or otherwise marked and shall remain undisturbed except as allowed in subsection E. Such markings shall be maintained until construction is complete.
5. Walkways and bike paths:
    a. A gravel, earthen, tree bark product, or equivalent walkway or bike path shall not be constructed closer than 10 feet from the boundary of the Protected Water Feature. Walkways and bike paths shall be constructed so as to minimize disturbance to existing vegetation. Where practicable, a maximum of 50 percent of the trail may be within 30 feet of the Protected Water Feature.
    b. A paved walkway or bike path shall not be constructed closer than 10 feet from the boundary of the Protected Water Feature. For any paved walkway or bike path, the width of the Water Quality Resource Area must be increased by a distance equal to the width of the paved path. Walkways and bike paths shall be constructed so as to minimize disturbance to existing vegetation. Where practicable, a maximum of 25 percent of the trail may be within 30 feet of the Protected Water Feature; and
    c. A walkway or bike path shall not exceed 12 feet in width.

2. The location of all existing natural features including, but not limited to, all trees of a caliper greater than six (6) inches diameter at a height of four feet, natural or historic drainages on the site, springs, seeps and outcroppings of rocks, or boulders within the Water Quality Resource Area.
3. Location of Title 3 wetlands. Where Title 3 wetlands are identified, the applicant shall follow the Division of State Lands recommended wetlands delineation process. The delineation shall be prepared by a professional wetlands specialist.
4. An inventory and location of existing debris and nuisance plants.
5. An assessment of the existing condition of the Water Quality Resource Area in accordance with Table 2.
6. An inventory of vegetation, including percentage ground and canopy coverage.
7. An analysis of the impacts the proposed development may have on the Water Quality Resource Area. This discussion shall take into account relevant natural features and characteristics of the Water Quality Resource Area, including hydrology, soils, bank stability, slopes of lands abutting the water resources, hazards of flooding, large trees and wooded features. The discussion shall identify fish and wildlife resources that utilize or inhabit the impact area in the course of a year and the impact of the proposed development on water resource values;
8. An analysis of the impacts the proposed development will have on the water quality of affected water resources, taking into account relevant natural features and characteristics of the Water Quality Resource Area;
9. An analysis of measures which feasibly can be taken to reduce or mitigate the impact of the proposed development on the Water Quality Resource Area and their vegetated corridors, including proposed drainage and erosion control measures, and an analysis of the effectiveness of these measures;
10. The water resources report shall be prepared by one or more qualified professionals including a wetlands biologist or hydrologist whose credentials are presented in the report.

11. Alternatives analysis demonstrating that:
    a. No practicable alternatives to the requested development exist that will not disturb the Water Quality Resource Area;
    b. Development in the Water Quality Resource Area has been limited to the area necessary to allow for the proposed use;
    c. The Water Quality Resource Area can be restored to an equal or better condition in accordance with Table 2;
    d. It will be consistent with a Water Quality Resource Area Mitigation Plan;
    e. An explanation of the rationale behind choosing the alternative selected, including how adverse impacts to resource areas will be avoided or minimized and mitigated.
    f. For applications seeking an alteration, addition, rehabilitation or replacement of existing structures:
        (1) Demonstrate that no reasonably practicable alternative design or method of development exists that would have a lesser impact on the Water Quality Resource Area than the one proposed; and
        (2) If no such reasonably practicable alternative design or method of development exists, the project should be conditioned to limit its disturbance and impact on the Water Quality Resource Area to the minimum extent necessary to achieve the proposed addition, alteration, restoration, replacement or rehabilitation; and

C. Uses Permitted Outright

1. Stream, wetland, riparian and upland enhancement or restoration projects; and farming practices as defined in ORS 30.930 and farm uses, excluding buildings and structures, as defined in ORS 215.203.
2. Placement of structures that do not require a grading or building permit.
3. Routine repair and maintenance of existing structures, roadways, driveways, utility facilities, accessory uses and other development.

D. Uses Under Prescribed Conditions

1. Repair, replacement or improvement of utility facilities where the disturbed portion of the Water Quality Resource Area is restored and vegetation is replaced with vegetation from the Oregon City Native Plant List.
2. Additions, alterations, rehabilitation, or replacement of existing structures that do not increase existing structural footprint in and will have no greater material adverse impact on the Water Quality Resource Area where the disturbed portion of the Water Quality Resource Area is restored using native vegetative cover.
3. Public capital improvement projects that comply with the development standards of this chapter. The City Engineer will determine compliance with Water Quality Resource Area standards.

E. Provisional Uses

The following uses are allowed in the Water Quality Resource Area subject to compliance with the Application Requirements and Development Standards of subsections G and H:

1. Any use allowed in the base zone, other than those listed in subsection C and D above.
2. Measures to remove or abate nuisances, or any other violation of State statute, administrative agency rule or City ordinance.
3. Roads to provide access to Protected Water Features or necessary ingress and egress across Water Quality Resource Areas.
4. New public or private utility facility construction.
5. Walkways and bike paths. (subsection H.5).
6. New stormwater pre-treatment facilities (subsection H.6).
7. Widening an existing road adjacent to or running parallel to a Water Quality Resource Area.
8. Additions, alterations, rehabilitation or replacement of existing structures, roadways, accessory uses and development that increase the structural footprint within the Water Quality Resource Area consistent with Subsection H.7.

F. Prohibited Uses

1. Any new development, other than that listed in subsection C, D and E.
2. Uncontained areas of hazardous materials as defined by the Department of Environmental Quality.

G. Application Requirements

Applications for Provisional Uses in the Water Quality Resource Area must provide the following information in a water resources report in addition to the information required for the base zone.

1. A topographic map of the site at contour intervals of five feet or less showing a delineation of the Water Quality Resource Area, which includes areas shown on the City Water Quality and Flood Management Areas map.

TABLE 1
Width of Vegetated Corridor

Protected Water Feature Type (see definitions)	Slope Adjacent to Protected Water Feature	Starting Point for Measurements from Water Feature	Width of Vegetated Corridor (See Note #1)
Anadromous fish-bearing streams	Any slope	• Edge of bankfull flow	200 feet
Intermittent streams with slopes less than 25 percent and which drain less than 100 acres	< 25 percent	• Edge of bankfull flow	15 feet
All other Protected Water Features	<25 percent	• Edge of bankfull flow • Delineated edge of Title 3 Wetland	50 feet
	≥ 25 percent for 150 feet or more (see Note #2).		200 feet
	≥ 25 percent for less than 150 feet (see Note #2).		Distance from starting point of measurement to top of ravine (break in ≥25 percent slope) (see Note #3) plus 50 feet.

Notes:

1. Required width (measured horizontally) of vegetated corridor unless reduced pursuant to the provisions of 17.49.050(I).
2. Vegetated corridors in excess of 50 feet apply on steep slopes only in the uphill direction from the protected water feature.
3. Where the Protected Water Feature is confined by a ravine or gully, the top of the ravine is the break in the ≥25 percent slope.

the applicant shall make application for such approval prior to or simultaneously with the submittal of its development application to the city engineer. The planning division shall coordinate city approvals with those of other agencies to the extent necessary and feasible. Any permit issued by the city pursuant to this chapter shall not become valid until other agency approvals have been obtained or those agencies indicate that such approvals are not required.

b. The requirements of this chapter apply only to Water Quality Resource Areas within the Water Quality Resource Area Overlay District. If, in the course of a development review, evidence suggest that a property outside the District may contain a Title 3 wetland or other protected water resource, the provisions of this chapter shall not be applied to that development review. However, the omission shall not excuse the applicant from satisfying any state and federal wetland requirements which are otherwise applicable. Those requirements apply in addition to, and apart from the requirements of the city's comprehensive plan and this code. Additionally, the standards of 17.49.090 shall be applied to the resource and, if the standards of 17.49.090 are met, the District boundaries shall be amended.

B. The City shall review the Water Quality and Flood Management Areas Maps during periodic review as required by ORS 197.633 (1997).

17.49.050 Water Quality Resource Area Standards. This section applies to Water Quality Resource Areas within the Water Quality Resource Area Overlay District.

A. The purpose of this section is to protect and improve the beneficial water uses and functions and values of Water Quality Resource Areas.

B. The Water Quality Resource Area is the vegetated corridor and the Protected Water Feature. The width of the vegetated corridor is specified in Table 1. At least three slope measurements along the water feature, at no more than 50-foot increments, shall be made for each property for which development is proposed. Depending on the slope measurements, the width of the vegetated corridor may vary.

FOR TABLE 1 REFER TO NEXT PAGE

2. Applications for development other than those described in paragraph 1 of this subsection shall demonstrate compliance with these standards as part of a land use review or limited land use review process as established in Chapter 17.50.

17.49.040 Administration.

A. This chapter establishes a Water Quality Resource Area Overlay District, which is delineated on the Water Quality and Flood Management Areas Map attached and incorporated by reference as a part of this document. The official map is on file in the office of the City Recorder.

1. The Oregon City Local Wetland Inventory, as amended, shall be a reference for identifying areas subject to the Water Quality Resource Area Overlay District.
2. Applicants are required to provide the City with a field verified delineation of the Water Quality Resource Areas on the subject property as part of their application. An application shall not be complete until this delineation is submitted to the City. If the protected water feature is not located on the subject property and access to the water feature is denied, then existing data may be used to delineate the boundary of the Water Quality Resource Area.
3. The standards for development contained in this chapter are applicable to areas located within a Water Quality Resource Area. Applications for development on a site located in the Water Quality Resource Area Overlay District may request a determination that the subject site is not in a Water Quality Resource Area and thus is not subject to the standards of 17.49.050.
   a. Applicants for a determination under this section shall submit a site plan meeting the following requirements:
      i) The site plan must be drawn at a scale of no less than 1"=20';
      ii) The site plan must show the location of the proposed development and the lot lines of the property on which development is proposed;
      iii) The site plan must show the location of the Protected Water Feature. If the Protected Water Feature is a wetland, the delineation must be made by a qualified wetlands specialist pursuant to the 1987 Corps of Engineers Delineation Manual. For all other Protected Water Features, the location must be established by a registered professional engineer or surveyor licensed by the State of Oregon.
      iv) The site plan must show the location of the Water Quality Resource Area;
      v) If the proposed development is closer than 200 feet to the Protected Water Feature, the site plan must include contour intervals of no greater than 5 feet; and
      vi) If the vegetated corridor is fifteen feet, the site plan must show the Protected Water Feature's drainage area, including all tributaries.

   b. Alternatively, an applicant may have the City staff gather the information necessary to determine the location of the Water Quality Resource Area by making an application therefore and paying to the City a fee as set by resolution of the City Commission.

   c. Determinations under this section will be made by the Planning Manager, or designee, as a Type II decision.

4. Compliance with federal and state requirements.
   a. If the proposed development requires the approval of any other governmental agency, such as the Division of State Lands or the U.S. Army Corps of Engineers,

naturally occurring prior to construction of such watercourses. For the purposes of this chapter, streams are categorized into two classes: perennial streams and intermittent streams. Perennial stream means a stream that flows year-round during years of normal precipitation. Intermittent stream means a stream that flows only part of the year, or seasonally, during years of normal precipitation.

"Structure(s)" means a building or other major improvement that is built, constructed or installed, or manmade improvements to land that are used, or expected to be used including, but not limited to utility lines, manholes, catch basins, driveways, sidewalks. It does not including minor improvements, such as fences, utility poles, flagpoles or irrigation system components, that are not customarily regulated through zoning codes.

"Title 3" means that part of the Metro Urban Growth Management Functional Plan which requires local governments to comply with Regional regulations. Title 3 is a part of those regional regulations. An ordinance (Ordinance No. 98-730C) adopted by the Metro Council on June 18, 1998.

"Title 3 Wetlands" means wetlands of metropolitan concern as shown on the Metro Water Quality and Flood Management Area Map and other wetlands added to city or county adopted Water Quality and Flood Management Area maps consistent with the criteria in 17.49.090(D). Title 3 wetlands do not include artificially constructed and managed stormwater and water quality treatment facilities.

"Top of Bank" means the same as "bankfull stage."

"Utility Facilities" means buildings, structures or any constructed portion of a system which provides for the production, transmission, conveyance, delivery or furnishing of services including, but not limited to, heat, light, water, power, natural gas, sanitary sewer, stormwater, telephone and cable television. Utility facilities do not include stormwater pre-treatment facilities.

"Vegetated Corridor" means the area of setback between the top of bank of a Protected Water Feature and the delineated edge of the Water Quality Resource Area as defined in Table 1 of this chapter.

"Water Quality Resource Areas" means vegetated corridors and the adjacent protected water feature as established by this Chapter.

"Watershed" means a geographic unit defined by the flows of rainwater or snowmelt. All land in a watershed drains to a common outlet, such as a stream, lake or wetland.

"Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands are those areas identified and delineated by a qualified wetland specialist as set forth in the 1987 Corps of Engineers Wetland Delineation Manual.

17.49.030 Applicability.

A. This chapter shall apply to development in the Water Quality Resource Area Overlay District, which may also be referred to as the "Water Resources Overlay District" in this Code. The overlay zone restricts the uses that are allowed in the base zone by right, with limitations, or as provisional uses.

B. This chapter does not apply to work necessary to protect, repair, maintain, or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies provided that after the emergency has passed, adverse impacts are mitigated in accordance with Table 2, Standards for Restoring Marginal Existing Vegetated Corridors.

C. These standards are in addition to any other applicable standards of this code.

1. Applications for subdivisions, partitions and planned developments shall demonstrate compliance with these standards as part of the review proceedings for those developments;

"Native Vegetation" means any vegetation listed on the Oregon City Native Plant list as adopted by Oregon City Commission resolution.

"Open Space" means land that is undeveloped and that is planned to remain so indefinitely. The term encompasses parks, forests, and farmland. It may also refer only to land zoned as being available to the public, including playgrounds, watershed preserves, and schools.

"Ordinary Mean High Water Line" means, as defined in OAR 141-82-005, the line on the bank or shore to which water ordinarily rises in season; synonymous with Mean High Water (ORS 274.005).

"Owner or Property Owner" means the person who is the legal record owner of the land, or where there is a recorded land sale contract, the purchaser thereunder.

"Parcel" means a single unit of land that is created by a partitioning of land. (ORS 92.010(7)).

"Partition" means the division of an existing land ownership into two or three parcels, within a calendar year, and is subject to approval of the Governing Body's Land Use and Development Ordinances.

"Practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose.

"Protected Water Features" shall include:

a. Title 3 wetlands;
b. rivers and perennial and intermittent streams;
c. springs which feed stream and wetlands and have year-round flow; and
d. natural lakes.

"Restoration" means the process of returning a disturbed or altered area or feature to a previously existing natural condition. Restoration activities reestablish the structure, function, and/or diversity to that which occurred prior to impacts caused by human activity.

"Resource" versus "Facility" means the distinction being made is between a "resource," a functioning natural system such as a wetland or stream; and a "facility" which refers to a created or constructed structure or drainage way that is designed, constructed and maintained to collect and filter, retain, or detain surface water run-off during and after a storm event for the purpose of water quality improvement.

"Riparian" means those areas associated with streams, lakes and wetlands where vegetation communities are predominately influenced by their association with water.

"Routine Repair and Maintenance" means activities directed at preserving an existing allowed use or facility, without expanding the development footprint or site use.

"Significant Negative Impact" means an impact that affects the natural environment, considered individually or cumulatively with other impacts on the Water Quality Resource Area, to the point where existing water quality functions and values are degraded.

"Steep Slopes" means those slopes that are equal to or greater than 25%. Steep slopes have been removed from the "buildable lands" inventory and have not been used in calculations to determine the number of acres within the urban growth boundary which are available for development.

"Stormwater" means the surface water runoff that results from all natural forms of precipitation.

"Stormwater Quantity Control and Quality Control Facility" means a component of a manmade drainage feature, or features designed or constructed to perform a particular function or multiple functions, including, but not limited to, pipes, swales, ditches culverts, street gutters, detentions basins, retention basins, wet ponds, constructed wetlands, infiltration devices, catch basins, oil/water separators, and sediment basins. Stormwater facilities shall not include building gutters downspouts and drains serving one single-family residence.

"Stormwater Pre-treatment Facility" means any structure or drainage way that is designed, constructed and maintained to collect and filter, retain, or detain surface water run-off during and after a storm event for the purpose of water quality improvement.

"Stream" means areas where surface water produces a defined channel or bed, including bedrock channels, gravel beds, sand and silt beds, and defined-channel swales. The channel or bed does not have to contain water year-round. This definition is not meant to include irrigation ditches, canals, storm or surface water runoff structures, or other artificial watercourses unless they are used to convey streams

"City Engineer" means the Engineer Manager for the City, their duly authorized representative(s), or the City's duly authorized representative(s) as designated by the City Manager.

"Created Wetlands" means wetlands developed in an area previously identified as a non-wetland to replace, or mitigate wetland destruction or displacement. A created wetland shall be regulated and managed the same as an existing wetland.

"Constructed Wetlands" means wetlands developed as a water quality or quantity facility, subject to change and maintenance as such. These areas must be clearly defined and separated from naturally occurring or created wetlands.

"Debris" means discarded man-made objects that would not occur in an undeveloped stream corridor or wetland. Debris includes, but is not limited to, tires, vehicles, litter, scrap metal, construction waste, lumber, plastic or styrofoam. Debris does not include objects necessary to a use allowed by this ordinance, or ornamental and recreational structures. Debris does not include existing natural plant materials or natural plant materials which are left after flooding, downed or standing dead trees or trees which have fallen into protected water features.

"Development" for the purpose of this Chapter the following definition of "development" applies: any manmade change defined as buildings or other structures, mining, dredging, paving, filling, or grading in amounts greater than ten (10) cubic yards on any lot or excavation. In addition, any other activity that results in the removal of more than 10 percent of the existing vegetation in the Water Quality Resource Area on a lot is defined as development. Development does not include the following: a) Stream enhancement or restoration projects approved by the City; b) Farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of this Chapter; and c) Construction on lots in subdivisions meeting the criteria of ORS 92.040(2) (1995).

"Disturb" means man-made changes to the existing physical status of the land, which are made in connection with development. The following uses are excluded from the definition:

1. enhancement or restoration of the Water Quality Resource Area;
2. planting native cover identified in the Oregon City Native Plant List as adopted by Oregon City Commission resolution;
3. installation of erosion control measures pursuant to an approved erosion and sediment control plan under Chapter 17.47.

"Emergency" means any man-made or natural event or circumstance causing or threatening loss of life, injury to person or property, and includes, but is not limited to, fire, explosion, flood, severe weather, drought, earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

"Enhancement" the process of improving upon the natural functions and/or values of an area or feature which has been degraded by human activity. Enhancement activities may or may not return the site to a pre-disturbance condition, but create/recreate processes and features that occur naturally.

"Erosion" means the movement of soil particles resulting from actions of water, wind or mechanical means.

"Fill" means any material such as, but not limited to, sand, gravel, soil, rock or gravel that is placed for the purposes of development or redevelopment.

"Invasive Non-native", "Nuisance", "Prohibited" or "Noxious Vegetation" means plant species that have been introduced and, due to aggressive growth patterns and lack of natural enemies in the area where introduced, spread rapidly into native plant communities, or which are listed as invasive, nuisance, prohibited or noxious plants on the Oregon City Nuisance Plant List.

"Metro" means the regional government of the Portland metropolitan area and the elected Metro Council as the policy setting body of the government.

"Mitigation" means the reduction of adverse effects of a proposed project by considering, in the following order: a) avoiding the impact all together by not taking a certain action or parts of an action; b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; c) rectifying the impact by repairing, rehabilitating or restoring the effected environment; d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action by monitoring and taking appropriate measures; and e) compensating for the impact by replacing or providing comparable substitute water quality resource areas.

Section 10. That Title 17: Zoning, Chapter 17.49 WR WATER RESOURCES OVERLAY DISTRICT is hereby repealed and a new Title 17: ZONING, Chapter 17.49: WATER QUALITY RESOURCE AREA OVERLAY DISTRICT is hereby enacted to read as follows:

CHAPTER 17.49

WATER QUALITY RESOURCE AREA OVERLAY DISTRICT

Sections:

17.49.010 Purpose
17.49.020 Definitions
17.49.030 Applicability
17.49.040 Administration
17.49.050 Water Quality Resource Area Standards
17.49.060 Subdivisions and Partitions
17.49.070 Density Transfer
17.49.080 Variances
17.49.090 Map Administration
17.49.100 Consistency
17.49.110 Severability

17.49.010 Purpose. There is established in the city a Water Quality Resource Area Overlay District. The Water Quality Resource Area Overlay District is an overlay zone classification and all conditions and restrictions of land use established by this title of the city's zoning ordinance shall be in addition to such restrictions and conditions as may be imposed and established in underlying zoning districts.

It is the purpose of this chapter to protect and improve water quality, to support beneficial water uses, and to protect the functions and values of existing and newly established Water Quality Resource Areas which provide a vegetated corridor to separate Protected Water Features from development. The vegetated corridor assists in many functions, including, but not limited to, the following:

1. Maintain or reduce stream temperatures;
2. Maintain natural drainage routes, floodplains, and moderate stormwater flows;
3. Reduce potential sediment, nutrient and pollutant loading into water;
4. Provide erosion control, filtration, infiltration and natural water purification; and
5. Maintain channel stability to reduce potential landslides contributing to sedimentation of water features.

17.49.020 Definitions. Unless specifically defined below, words and phases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application.

"Anadromous Fish-Bearing Stream" means a stream or portion of a stream which is identified by resolution of the City Commission as spawning or rearing habitat for those species of fish which return to rivers from the sea for breeding.

"Bankfull Stage" or "Bankfull Flow" means the stage or elevation at which water overflows the natural banks of streams or other waters of this state. The bankfull stage or flow may be approximated using either the two-year recurrence interval flood elevation or one foot measured vertically above the Ordinary Mean High Water Line.

"Beneficial Uses" or "Beneficial Water Uses" means, as defined by the Oregon Department of Water Resources, use of an instream public use of water for the benefit of an appropriator for a purpose consistent with the laws and the economic and general welfare of the people of the state and includes, but is not limited to, domestic, fish life, industrial, irrigation, mining, municipal, pollution abatement, power development, recreation, stockwater and wildlife uses.

D. The erosion and sediment control facilities herein are the minimum requirements for anticipated site conditions. During the construction period, these erosion and sediment control facilities shall be upgraded as needed for unexpected storm events and to ensure that sediment laden water does not leave the site.

E. Any observation of visible or measurable erosion, or an observation of more than a ten-percent increase in downstream channel turbidities, will result in an enforcement action by the City.

F. The owner or his/her designated representative shall implement the measures and construct facilities as provided for and according to the implementation schedule in the approved plan. The Manager shall be allowed reasonable access to the development site for inspection purposes.

17.47.090 Plan Performance Guarantee and Security. After the plan is approved by the Manager and prior to construction or grading, the owner shall provide a financial guarantee. Erosion and sediment control shall be included in the cost estimate for the primary project, such as land division or site plan, and included in that project's performance guarantee.

17.47.100 Correction of Ineffective Measures and Enforcement.

A. If the owner or his/her designated representative fails to follow the plan as approved by the Manager or fails to submit a plan when one is required, the Manager may, after inspecting the property, issue a stop work order halting all work on the development site until the requirements of the plan are met or implemented as applicable. Accompanying the stop work order shall be a written statement or list from the Manager specifying what is wrong and what steps the owner must take to bring the development into compliance. The stop work order shall not be lifted until mitigation measures are implemented that comply with Oregon City performance standards for erosion and sediment control and are approved by the Manager.

B. If the facilities and techniques in the approved plans are not effective or sufficient to meet the purposes of this chapter, based on an on-site inspection, the Manager may require a revision to the plan. Such requirement shall be in writing and shall explain the problem and suggested measures to remedy the problem. The notice shall be presented to the owner and any other responsible parties.

1. The revised plan shall be provided within three business days of when written notification by the Manager is received. Receipt of such notice shall be deemed complete three days after simultaneous regular mail and certified mail is deposited in the mail.
2. The owneror his/her designated representative shall implement fully the revised plan within three business days of receipt of the revised plan as provided in the previous subdivision, or within such other time frame as the Manager may specify.
3. In cases where significant erosion is occurring, the manager may require the owner or his/her designated representative to install immediately interim control measures before submittal of revised plan.
4. If there is a confirmed or imminent threat of significant off-site erosion, the Manager shall issue a stop work order, upon issuance of which work on the development site shall halt. The stop work order shall not be lifted until mitigation measures are implemented that comply with Oregon City performance standards for erosion and sediment control and are approved by the Manager.

C. Enforcement. Erosion that migrates off of a development site is considered to be a nuisance that threatens the health, safety, and welfare of the citizens of Oregon City and is a violation of this chapter. Any owner who violates, or is responsible for a violation or this chapter or an approved plan, shall be subject to the enforcement procedures of this code including by the Code Enforcement Officer.

B. Approval Standards. An Erosion and Sediment Control Plan shall be approved only upon making the following findings:

1. The Erosion and Sediment Control Plan meets the requirements of the City of Oregon City Public Works Standards for Erosion and Sediment Control incorporated by reference as part of this ordinance;
2. The Erosion and Sediment Control Plan indicates that erosion and sediment control measures will be managed and maintained during and following development. The Erosion and Sediment Control Plan indicates that erosion and sediment control measures will remain in place until disturbed soil areas are permanently stabilized by landscaping, grass, approved mulch or other permanent soil stabilizing measures.

C. The Erosion and Sediment Control Plan shall be reviewed in conjunction with the requested development approval. If the development does not require additional review, the Manager may approve or deny the permit with notice of the decision to the applicant.

D. The City may inspect the development site to determine compliance with the Erosion and Sediment Control Plan and Permit.

E. Erosion that occurs on a development site that does not have an Erosion and Sediment Control Permit, or that results from a failure to comply with the terms of such a Permit, constitutes a violation of this ordinance.

F. If the Manager finds that the facilities and techniques approved in an Erosion and Sediment Control Plan and Permit are not sufficient to prevent erosion, the Manager shall notify the owner or his/her designated representative. Upon receiving notice, the owner or his/her designated representative shall immediately install interim Erosion and Sediment Control measures as specified in the City of Oregon City Public Works Standards for Erosion and Sediment Control. Within three days from the date of notice, the owner or his/her designated representative shall submit a revised Erosion and Sediment Control Plan to the city. Upon approval of the revised plan and issuance of an amended Permit, the owner or his/her designated representative shall immediately implement the revised plan.

G. Approval of an Erosion and Sediment Control Plan does not constitute an approval of permanent road or drainage design (e.g. size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).

17.47.080 Plan Implementation. An approved Erosion Control and Sediment Control Plan shall be implemented and maintained as follows:

A. Plan approval, where required, shall be obtained prior to clearing or grading. No grading, clearing or excavation of land requiring a plan shall be undertaken prior to approval of the plan.

B. The Erosion and Sediment Control facilities shall be constructed prior to any clearing and grading activities, and maintained in such a manner as to ensure that sediment laden water does not enter the drainage system or violate applicable water standards.

C. The implementation of an Erosion and Sediment Control Plan and the construction, maintenance, replacement, and upgrading of erosion and sediment control facilities is the responsibility of the owner or his/her designated representative until all construction is completed and approved, and vegetation, landscaping or approved finished surfaces is established.

"Metro" means the regional government of the Portland metropolitan area and the elected Metro Council as the policy setting body of the government.

"Owner" means any party, including an owner, part owner or agent that has a legal interest in a piece of real property upon which development is proposed.

"Sediment" means any soil, sand, dirt, dust, mud, rock, gravel, refuse or any other organic or inorganic material that is in suspension, is transported, has been moved or is likely to be moved by erosion.

"Utility Facilities" means buildings, structures or any constructed portion of a system which provides for the production, transmission, conveyance, delivery or furnishing of services including, but not limited to, heat, light, water, power, natural gas, sanitary sewer, stormwater, telephone and cable television. Utility facilities do not include stormwater pre-treatment facilities.

"Visible or Measurable Erosion" includes, but is not limited to:

a. Deposits of mud, dirt sediment or similar material exceeding one-half cubic foot in volume on public or private streets, adjacent property, or onto the storm and surface water system, either by direct deposit, dropping discharge, or as a result of the action of erosion.

b. Evidence of concentrated flows of water over bare soils; turbid or sediment laden flows; or evidence of on-site erosion such as rivulets on bare soil slopes, where the flow of water is not filtered or captured on the site.

c. Earth slides, mudflows, earth sloughing, or other earth movement that leaves the property.

17.47.030 Applicability.

A. This chapter, which may also be referred to as "Erosion Control" in this Code, applies to development that may cause visible or measurable erosion on any property within the city limits of Oregon City.

B. This chapter does not apply to work necessary to protect, repair, maintain, or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies, provided that after the emergency has passed, adverse impacts are mitigated in accordance with applicable standards.

17.47.040 Abrogation and Greater Restrictions. Where the provisions of this chapter are less restrictive or conflict with comparable provisions of the zoning ordinance, regional, state or federal law, the provisions that are more restrictive shall govern. Where this document imposes restrictions that are more stringent than regional, state and federal law, the provisions of this document shall govern. However, nothing in this chapter shall relieve any party from the obligation to comply with any applicable federal, state or local regulations or permit requirements.

17.47.050 Severability. The provisions of this chapter are severable. If any section, clause or phrase of this chapter is adjudged to be invalid by a court of competent jurisdiction, the decision of that court shall not affect the validity of the remaining portions of this ordinance.

17.47.060 Permit Required. The applicant must obtain an Erosion and Sediment Control Permit prior to, or contemporaneous with, the approval of an application for any building, land use or other city issued permit that may cause visible or measurable erosion.

17.47.070 Erosion and Sediment Control Plans.

A. An application for an Erosion and Sediment Control Permit shall include an Erosion and Sediment Control Plan, which contains methods and interim measures to be used during and following construction to prevent or control erosion prepared in compliance with City of Oregon City Public Works Standards for Erosion and Sediment Control. These standards are incorporated herein and made a part of this Title and are on file in the office of the City Recorder.

17.47.070 Erosion and Sediment Control Plans
17.47.080 Plan Implementation
17.47.090 Plan Performance Guarantee and Security
17.47.100 Correction of Ineffective Measures and Enforcement

17.47.010 Purpose. The purpose of this chapter is to require erosion prevention measures and sediment control practices for all development during construction to prevent and restrict the discharge of sediments, and to require final permanent erosion prevention measures, which may include landscaping, after development is completed. Erosion prevention techniques shall be designed to protect soil particles from the force of water and wind and other mechanical means so that they will not be transported from the site. Sediment control measures shall be designed to capture soil particles after they have become dislodged by erosion and attempt to retain the soil particles on site.

The objective of these measures is to control, at the source, water and air borne erosion and the air and water pollution that results from such erosion mechanisms. This chapter recognizes that all non-point discharges eventually end up in surface water bodies. This chapter is intended to control water quality degradation from construction and development activities and it applies in addition to any other applicable provision of this code, state or federal law. This chapter is not intended to serve as a guideline for storm water management control measures for already constructed developments.

17.47.020 Definitions. Unless specifically defined below, words and phases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application.

"Development" means any manmade change to improved or unimproved real estate, including but not limited to the construction of buildings or other structures, sewers, streets or other structures or facilities, mining, dredgeing, paving, filling, or grading in amounts greater than ten (10) cubic yards on any lot or excavation. In addition, any other activity that results in the removal of more than 10 percent of the existing vegetation in the Water Quality Resource Area on a lot is defined as development. Development does not include the following: a) Stream enhancement or restoration projects approved by the City; b) Farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of this Chapter; and (c) construction on lots in subdivisions meeting the criteria of ORS 92.040(2)(1995).

"Development site" means any lot or lots on any part of which development is taking place.

"Disturb" means man-made changes to the existing physical status of the land that are made in connection with development. The following uses are excluded from the definition:

1. Enhancement or restoration of the Water Quality Resource Area;
2. Planting native cover identified in the Oregon City Native Plant List.

"Emergency" means any man-made or natural event or circumstance causing or threatening loss of life, injury to person or property, and includes, but is not limited to, fire, explosion, flood, severe weather, drought, earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

"Erosion" means the movement of soil particles resulting from actions of water, wind or mechanical means.

"Excavation" means any act of development by which soil or rock is cut into, dug, quarried, uncovered, removed, displaced, exposed or relocated.

"Fill" means any material such as, but not limited to, sand, gravel, soil, rock or gravel that is placed for the purposes of development or redevelopment.

"Manager" means the City Manager or the City manager's designated representative.

B. The purpose of this section is to allow density accruing to portions of a property within the Flood Management Overlay District to be transferred outside the overlay district.

1. Development applications shall comply with the submittal requirements of Section 17.64, Planned Unit Development, if the applicant wishes to transfer density.
2. Density transfers shall be allowed if the applicant demonstrates compliance with the following standards:
    a. The density transfer is proposed as part of a Planned Unit Development and meets the requirements of 17.64.050.
    b. Minimum density standards will not increase due to the density transfers.
    c. The area of land contained in a Flood Management Area may be excluded from the calculations for determining compliance with minimum density requirements of the zoning code.

17.42.200 Floodways. Located within areas of special flood hazard established in Section 17.42.040 are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles, and erosion potential, the following provisions apply:

A. Encroachments, including fill, new construction, substantial improvements and other development shall be prohibited unless certification by a registered professional engineer or architect is provided demonstrating that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

B. Construction or reconstruction of residential structures is prohibited within designated floodways, except for (i) repairs, reconstruction, or improvements to a structure which do not increase the ground floor area; and (ii) repairs, reconstruction or improvements to a structure, the cost of which does not exceed 50 percent of the market value of the structure either, (a) before the repair, or reconstruction started, or (b) if the structure has been damaged and is being restored, before the damage occurred. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions or to structures identified as historic places shall not be included in the 50 percent.

B. If Section 17.42.200(A) is satisfied, all new construction and substantial improvements shall comply with all applicable flood management area standards of Sections 17.42.170 through 17.42.200.

Section 9. That Title 17: ZONING, Chapter 17.47: EROSION CONTROL is hereby repealed and a new Title 17: ZONING, Chapter 17.47: EROSION AND SEDIMENT CONTROL is hereby enacted to read as follows:

CHAPTER 17.47

EROSION AND SEDIMENT CONTROL

Sections:

17.47.010 Purpose
17.47.020 Definitions
17.47.030 Applicability
17.47.040 Abrogation and Greater Restrictions
17.47.050 Severability
17.47.060 Permit Required

a. On sites which are (1) outside of a manufactured home park or subdivision, (2) in a new manufactured home park or subdivision, (3) in an expansion to an existing manufactured home park or subdivision, or (4) in an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood; the manufactured home shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated one foot above the base flood elevation and be securely anchored to an adequately designed foundation system to resist flotation, collapse and lateral movement.

b. On sites within an existing manufactured home park or subdivision that are not subject to the above manufactured home provisions, the manufactured home shall be elevated so that either:

(1) The lowest floor of the manufactured home is elevated one foot above the base flood elevation, or

(2) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately designed foundation system to resist flotation, collapse, and lateral movement.

7. Recreational Vehicles. Recreational vehicles placed on sites within Zones A1-30, AH, and AE as shown on the Flood Insurance Rate Map shall:

a. Be on site for fewer than 180 consecutive days, and be fully licensed and ready for highway use, on its wheels or jacking system, attached to the site only by quick disconnect type utilities and security devices, and have no permanently attached additions; or

b. Meet the requirements of 17.42.170(E)(6) above and the elevation and anchoring requirements for manufactured homes.

17.42.180 Review of Building Permits. Where elevation data is not available either through the Flood Insurance Study or from another authoritative source (Section 17.42.110), application for building permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness shall be made by the Building Official, considering use of historical data, high water marks, photographs of past floodings, etc., where available, and the provisions of this Title. Failure to elevate at least two feet above grade in these zones may result in higher insurance rates.

17.42.190 Subdivision Standards.

A. Subdivision Proposals

1. All subdivision proposals shall be consistent with the need to minimize flood damage.
2. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.
3. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage.
4. Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least fifty lots or five acres (whichever is less).
5. All structures and site grading developed or conducted in conjunction with a subdivision proposal shall comply with 17.42.170, Flood Management Area Standards.

3. Utilities-
   a. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.
   b. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharge from the systems into floodwaters.
   c. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

4. Residential Construction-
   a. New construction and substantial improvements of any residential structure shall have the lowest floor, including basement, elevated to at least one foot above the design flood elevation.
   b. Fully enclosed areas below the lowest floor that are subject to flooding are prohibited unlesss they are designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:
      1. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.
      2. The bottom of all openings shall be no higher than one foot above grade.
      3. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

5. Non-Residential Construction - New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated to at least one foot above base flood elevation; or, together with attendant utility and sanitary facilities, shall:
   a. Be flood proofed so that below the design flood level the structure is watertight with walls substantially impermeable to the passage of water provided that the requirements of Section 17.42.170(D)(2) are met;
   b. Have structured components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;
   c. Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications and plans. Such certifications shall be provided to the official as set forth in Section 17.42.120(B);
   d. Nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in 17.42.170(E)(4)(b); and
   e. Applicants flood proofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g. a building constructed to the design flood level will be rated as one foot below that level).
6. Manufactured Homes - The following standards apply to all manufactured homes to be placed or substantially improved on sites within Zones A1-A-30, AH, and AE on the community's FIRM.

2. No net fill in any floodplain is allowed. All fill placed in a floodplain shall be balanced with at least an equal amount of soil material removed. For the purposes of calculating net fill, fill shall include any structure below the design flood elevation that has been flood proofed pursuant to Section 17.42.170(E)(5).
3. Any excavation below bankfull stage shall not count toward compensating for fill.
4. Excavation to balance a fill shall be located on the same parcel as the fill unless it is not practicable to do so. In such cases, the excavation shall be located in the same Oregon City floodplain, so long as the proposed excavation and fill will not increase flood impacts for surrounding properties as determined through hydrologic and hydraulic analysis.
5. For excavated areas identified by the City to remain dry in the summer, such as parks or mowed areas, the lowest elevation of the excavated area shall be at least 6 inches above the winter "low water" elevation, and sloped at a minimum of two percent towards the Protected Water Feature pursuant to Chapter 17.49. One percent slopes will be allowed in smaller areas.
6. For excavated areas identified by the City to remain wet in the summer, such as a constructed wetland, the grade shall be designed not to drain into the Protected Water Feature pursuant to Chapter 17.49.
7. Parking areas in the floodplain shall be accompanied by signs that inform the public that the parking area is located in a flood management area and that care should be taken when the potential for flooding exists.
8. Temporary fills permitted during construction shall be removed at the end of construction, 30 days after subdivision acceptance or completion of the final inspection.
9. New culverts, stream crossings and transportation projects shall be designed as balanced cut and fill projects or designed not to significantly raise the design flood elevation. Such projects shall be designed to minimize the area of fill in Flood Management Areas and to minimize erosive velocities. Stream crossings shall be as close to perpendicular to the stream as practicable. Bridges shall be used instead of culverts wherever practicable.
10. Excavation and fill required for the construction of detention facilities or structures, and other facilities, such as levees, specifically shall be designed to reduce or mitigate flood impacts and improve water quality. Levees shall not be used to create vacant buildable lands.

E. Construction Standards
   1. Anchoring-
      a. All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure.
      b. All manufactured homes must likewise be anchored to prevent flotation, collapse or lateral movements and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (reference FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebooks for additional techniques).
   2. Construction Materials and Methods-
      a. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
      b. All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.
      c. Electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

F. The City Recorder shall maintain the records of all appeal actions and the Building Official shall report any granted variances to the Federal Insurance Administration upon request.

17.42.160 Conditions for Variances. The Planning Commission may impose such conditions as are deemed necessary to limit any adverse impacts that may result from granting relief. If a variance is granted pursuant to section 17.42.150, the variance shall be subject to the following conditions:

In addition to other standards listed in Section 17.42.170, the following conditions must be met:

A. Variances may be issued for the reconstruction or restoration of structures listed on the National Register of Historic Places, pursuant to Chapter 17.60 and without regard to the procedures set forth in the remainder of this Chapter.

B. Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.

C. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

D. Any applicant to whom a variance is granted shall be given notice that the structure will be permitted to be built with the lowest flood elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increase resulting from the reduced lowest floor elevation.

17.42.170 Flood Management Area Standards.

A. Uses Permitted Outright:
1. Excavation and fill required to plant any new trees or vegetation.
2. Restoration or enhancement of floodplains, riparian areas, wetland, upland and streams that meet federal and state standards provided that any restoration project which encroaches on the floodway complies with the requirements of this Section 17.42.200 (Floodways).

B. Provisional Uses:

All uses allowed in the base zone or existing flood hazard overlay zone are allowed in the Flood Management Overlay District subject to compliance with the Development Standards of this section.

C. Prohibited Uses:
1. Any use prohibited in the base zone.
2. Uncontained areas of hazardous materials as defined by the Department of Environmental Quality.

D. Site Development Standards
All development in the floodplain shall conform to the following balanced cut and fill standards:
1. This subsection does not apply to work necessary to protect, repair, maintain, or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies provided that, after the emergency has passed, adverse impacts are mitigated in accordance with applicable standards.

2. In addition to the public notice requirements outlined in 17.50.090, Metro shall be notified within 14 days of the City receiving an application to vary the requirements of this section and within 14 days of a decision on the variance.
3. The requirements of Section 17.60.020 (Variances--Grounds) do not apply to requests to vary from the standards of Chapter 17.42.
4. If an application to vary from the standards of Chapter 17.42 is made in conjunction with an application to vary from other standards of Title 17, the variances may be processed as one application, provided the standards applicable to each variance requested must be met before the requested variance may be granted.

C. Hardship Variance

Variances to avoid unreasonable hardship caused by the strict application of this chapter are permitted subject to the criteria set forth in this section. To vary from the requirements of this ordinance, the applicant must demonstrate the following:

1. The variance is the minimum necessary to allow the proposed use or activity;
2. The variance will not increase danger to life and property due to flooding or erosion;
3. The impact of the increase in flood hazard which will result from the variance will not prevent the City from meeting the requirements of this chapter. In support of this criteria the applicant shall have a qualified professional engineer document the expected height, velocity and duration of flood waters, and estimate the rate of increase in sediment transport of the flood waters expected both downstream and upstream as a result of the variance;
4. The variance will not increase the cost of providing and maintaining public services during and after flood conditions so as to unduly burden public agencies and taxpayers; and
5. The proposed use complies with the standards of the base zone.

D. The Planning Commission shall hear and decide appeals and requests for variances when it is alleged there is an error in any requirement, decision or determination made by the Building Official in the enforcement or administration of these regulations, or that enforcement of this district would result in exceptional hardship.

In passing upon such applications, the Planning Commission shall consider all technical evaluations, all relevant factors, standards specified in other sections of this Title, and:

1. The danger that materials may be swept onto other lands to the injury of others;
2. The danger to life and property due to flooding or erosion damage;
3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
4. The importance of the services provided by the facility to the community;
5. The necessity to the facility of a waterfront location, where applicable;
6. The availability of alternative locations for the proposed use, which are not subject to flooding or erosion damage;
7. The compatibility of the proposed use with existing and anticipated development;
8. The relationship of the proposed use to the Comprehensive Plan;
9. The safety of access to the property in times of flood for ordinary and emergency vehicles;
10. The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site; and
11. The cost of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water systems, and streets and bridges.

E. Upon consideration of the factors listed in Section 17.42.150(D) and the purposes of this district, the Planning Commission may attach such conditions to the granting of variances as it deems necessary to meet the purposes of this district.

17.42.120 Information to be obtained and maintained.

The Building Official shall:

A. Where base flood elevation data is provided through the flood insurance study or required as in Section 17.42.110, obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structure, and whether or not the structure contains a basement.

B. For all new or substantially improved flood proofed structures:

1. Verify and record the actual elevation (in relation to mean sea level); and
2. Maintain the flood proofing certifications required in Section 17.42.090(C)(3);
3. Maintain for public inspection all records pertinent to the provisions of this chapter.

17.42.130 Alteration of watercourses.

A. Notify adjacent communities and the Department of Land Conservation and Development prior to any alteration or relocation of a water course, and submit evidence of such notification to the Federal Insurance Administration.

B. Require that maintenance is provided within the altered or relocated portion of the watercourse so that the flood-carrying capacity is not diminished.

17.42.140 Map Administration.

A. The purpose of this section is to provide a process for interpreting and amending the Water Quality and Flood Management Areas Map to clarify and correct the location of Flood Management Overlay District.

B. Interpretation of Map Boundaries:

The Building Official shall make interpretations, where needed, as to exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in Section 17.42.150.

C. Map Corrections shall be processed pursuant to the requirements of Chapter 17.68.

1. Within 90 days of receiving information establishing a possible error in the existence or location of the Flood Management Overlay District, the City shall provide notice to interested parties of a public hearing at which the City will review the information.
2. The City shall amend the Water Quality and Flood Management Areas Map if the information demonstrates that the boundaries of the Flood Management Overlay District have changed since adoption of the Water Quality and Flood Management Areas Map by Metro (June 18, 1998) provided that, in the case of a boundary established by FEMA, a Letter of Map Amendment (LOMA) or Letter of Map Revision is obtained from FEMA prior to any map change.

17.42.150 Appeals and variance procedure.

A. The purpose of this Section is to ensure that compliance with this chapter does not cause unreasonable hardship. To avoid such instances, the requirements of this chapter may be varied. Variances are also allowed when strict application of this chapter would deprive an owner of all economically viable use of land.

B. This Section applies to requests to vary from the standards of Chapter 17.42 only. Requests to vary from other standards of Title 17 shall be subject to the requirements of Chapter 17.60.

1. Variance applications made pursuant to this section shall follow the variance procedures outlined in 17.50.

2. Applicants are required to provide the City with a delineation of the Flood Management Areas on the subject property as part of any application. An application shall not be complete until this delineation is submitted to the City.

B. The City shall review the Water Quality and Flood Management Areas Maps during periodic review as required by ORS 197.633 (1997).

C. Development Permit: A development permit shall be obtained before construction or development begins within any portion of the Flood Management Overlay District. The permit shall be for all structures including manufactured homes, as set forth in Section 17.42.020 (Definitions) and all other development, including fill and other activities, as set forth in Section 17.42.020 (Definitions).

Application for a development permit shall be made on forms furnished by the Community Development Department. Requirements may include, but are not limited to: plans in duplicate drawn to scale showing the nature, location, dimensions and elevations of the area in question; existing or proposed structures, fill, storage materials, drainage facilities; and the location of the foregoing.

The following information is specifically required:

1. Elevation in relation to mean sea level of the lowest floor (including basement) of all structures;
2. Elevation in relation to mean sea level to which any structure has been flood proofed;
3. Certification by a registered professional engineer or architect that the flood proofing methods for any non-residential structure meet the flood proofing criteria in Section 17.42.170(E)(5); and
4. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

17.42.100 Building Official--duties and responsibilities.

A. The Building Official is appointed to administer and implement this title by granting or denying development permit applications in accordance with its provisions.

B. Duties of the Bulding Official shall include, but not be limited to those listed in this chapter.

C. The Building Official shall:

1. Review all development permits to determine that the permit requirements of this title have been satisfied;
2. Review all development permits to determine that all necessary permits have been obtained from those Federal, State or Local governmental agencies from which prior approval is required; and
3. Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the provisions of Section 17.42.200 are met.

17.42.110 Use of Other Base Flood Data. When base flood elevation data has not been provided in accordance with Section 17.42.040, the Building Official shall obtain, review and reasonably utilize any base flood elevation and floodway date available from a Federal, State or other source, in order to administer Sections 17.42.170 and 17.42.200.

1. Land contained within the 100-year floodplain, flood area and floodway as shown on the Federal Emergency Management Agency Flood Insurance maps including areas of special flood hazard pursuant to section 17.42.040 and the area of inundation for the February 1996 flood; and
2. Lands that have physical or documented evidence of flooding within recorded history based on aerial photographs of the 1996 flooding and/or the Water Quality and Flood Management Areas maps.

C. The standards that apply to the Flood Management Areas apply in addition to state or federal restrictions governing floodplains or flood management areas.

17.42.040 Basis for Establishing the Areas of Special Flood Hazard. The areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study for the City of Oregon City", dated January 29, 1979, with accompanying flood insurance maps is adopted by reference and declared to be a part of this chapter. The Flood Insurance Study is on file at the office of the City Recorder in the City Hall.

17.42.050 Compliance. No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of these floodplain regulations and other applicable regulations.

17.42.060 Abrogation and greater restrictions. This chapter is not intended to repeal, abrogate or impair any existing easements, covenants or deed restrictions. However, where this chapter and another section, easement, covenant or deed restriction conflict or overlap, whichever imposes the more stringent restriction shall prevail.

17.42.070 Warning and disclaimer of liability. The degree of flood protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This chapter does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flooding damages. This chapter shall not create liability on the part of the City, any officer or employee thereof, or the Federal Insurance Administration for any flood damages that result from reliance on this chapter or any administrative decision lawfully made thereunder.

17.42.080 Severability. The provisions of this chapter are severable. If any section, clause or phrase of this chapter is adjudged to be invalid by a court of competent jurisdiction, the decision of that court shall not affect the validity of the remaining portions of this ordinance.

17.42.090 Administration.

A. This chapter establishes a Flood Management Overlay District, which is delineated on the Water Quality and Flood Management Areas Map attached and incorporated by reference as a part of this document.
   1. The following maps and studies are adopted and declared to be a part of this Chapter. These maps are on file in the office of the City Recorder.
      a. The Water Quality and Flood Management Areas Map, dated June 7,1999;
      b. The Federal Insurance Administration, Flood Insurance Rate Maps for Oregon City dated February 15, 1980 and for Clackamas County dated August 4, 1987;
      c. The Federal Insurance Administration (FIA) "Flood Insurance Study for Oregon City", dated August, 1979;
      d. Oregon City and Clackamas County Flood Boundary and Floodway Maps, dated February 15, 1980 and August 4, 1987;

footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or shed not occupied as dwelling units or not a part of the main structure.

"Stormwater Pre-treatment Facility" means any structure or drainage way that is designed, constructed, and maintained to collect and filter, retain, or detain surface water run-off during and after a storm event for the purpose of water quality improvement.

"Stream" means a body of running water moving over the earth's surface in a channel or bed, such as a creek, rivulet or river. It flows at least part of the year, including perennial and intermittent streams. Streams are dynamic in nature and their structure is maintained through build-up and loss of sediment.

"Structure" means a walled and roofed building including a gas or liquid storage tank that is principally above ground.

"Substantial Improvement" means any repair, reconstruction or improvement of a structure, the cost of which equals or exceeds fifty percent of the market value of the structure either:

1. Before the improvement or repair is started; or
2. If the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

The term does not, however, include either:

1. Any project for improvement of a structure to correct existing violations of State or local health, sanitary or safety code specifications which has been identified by the local code enforcement official and that is the minimum necessary to assure safe living conditions; or
2. Any alteration of a "historic structure", provided that the alteration will not preclude the structure's continued designation as a "historic structure."

"Utility Facilities" means buildings, structures or any constructed portion of a system which provides for the production, transmission, conveyance, delivery or furnishing of services including, but not limited to, heat, light, water, power, natural gas, sanitary sewer, stormwater, telephone and cable television. Utility facilities do not include stormwater pre-treatment facilities.

"Variance" means a grant of relief from the requirements of this Chapter which permit construction in a manner that would otherwise be prohibited by this title.

"Watercourse" means a channel in which a flow of water occurs, either continuously or intermittently, and if the latter, with some degree of regularity. Such flow must be in a definite direction.

"Watershed" means a geographic unit defined by the flows of rainwater or snowmelt. All land in a watershed drains to a common outlet, such as a stream, lake or wetland.

"Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands are those areas identified and delineated by a qualified wetland specialist as set forth in the 1987 Corps of Engineers Wetland Delineation Manual.

17.42.030 Applicability

A. This chapter shall apply to development in the Flood Management Overlay District, which may also be referred to as the "Floodplain Overlay District" in this Code. The Flood Management Overlay District includes all areas of special flood hazards and all Flood Management Areas within the City. The overlay district restricts the uses that are allowed in the base zone by right, with limitations, or as provisional uses.

B. The Flood Management Areas which have been mapped include the following locations:

"Floodplain" means the land area identified and designated by the United States Army Corps of Engineers, the Oregon Division of State Lands, FEMA, or City of Oregon City that has been or may be covered temporarily by water as a result of a storm event of identified frequency. It is usually the flat area of land adjacent to a stream or river formed by floods.

"Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

"Floodway Fringe" means the area of the floodplain, lying outside the floodway, which does not contribute appreciably to the passage of flood water, but serves as a retention area.

"Lowest Floor" means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable nonelevation design requirements of this title found at Section 17.42.170(E)(4) or (5).

"Manufactured Home" means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."

"Manufactured Home Park or Subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

"Metro" means the regional government of the Portland metropolitan area and the elected Metro Council as the policy setting body of the government.

"Natural Location" means the location of those channels, swales, and other non-manmade conveyance systems as defined by the first documented topographic contours existing for the subject property either from maps or photographs, or such other means as appropriate.

"New Construction" means structure for which the "start of construction" commenced on or after the effective date of this title.

"New manufactured home park or subdivision" means a manufactured home park subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the puring of concrete pads) is completed on or after the effective date of this chapter.

"Ordinary Mean High Water Line" means, as defined in OAR 141-82-005, the line on the bank or shore to which water ordinarily rises in season; synonymous with Mean High Water (ORS 274.005).

"Ordinary Mean Low Water Line" means, as defined in OAR 141-82-005, the line on the bank or shore to which water ordinarily recedes in season; synonymous with Mean Low Water (ORS 274.005).

"Owner or Property Owner" means the person who is the legal record owner of the land, or where there is a recorded land sale contract, the purchaser thereunder.

"Parcel" means a single unit of land that is created by a partitioning of land. (ORS 92.010(7)).

"Practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose.

"Recreational Vehicle" means a vehicle which is:

a. Built on a single chassis;
b. 400 square feet or less when measured at the largest horizontal projection;
c. Designed to be self-propelled or permanently towable by a light duty truck; and
d. Designed primarily as temporary quarters for recreational, camping, travel, or seasonal use and not for use as a permanent dwelling.

"Start of Construction" is meant to include substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, placement or other improvement was within one hundred eighty days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or

"Bankfull Stage" means the stage or elevation at which water overflows the natural banks of streams or other waters of this state. The bankfull stage may be approximated by using either the two-year recurrence interval flood elevation or one foot measured vertically above the Ordinary Mean High Water Line.

"Base Flood" means the flood having a one percent chance of being equaled or exceeded in any given year. Also referred to as the one-hundred-year flood. Designation on maps always includes the letters A or V.

"Basement" means any area of the building having its floor subgrade (below ground level) on all sides.

"Design Flood Elevation" means the elevation of the base flood or 100-year storm as defined in FEMA (Federal Emergency Management Agency) Flood Insurance Studies, or the highest flood of record since the adoption of the Flood Insurance Maps, or, in areas without FEMA floodplains, the elevation of the 25-year storm, or the edge of mapped flood-prone soils or similar methodologies whichever is higher.

"Development" means any man-made change to improved or unimproved real estate, including but not limited to buildings, or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.

"Emergency" means any man-made or natural event or circumstance causing or threatening loss of life, injury to person or property, and includes, but is not limited to, fire, explosion, flood, severe weather, drought, earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

"Engineer" means a registered professional engineer licensed by the State of Oregon.

"Engineering Geologist" means a registered professional engineering geologist licensed by the State of Oregon.

"Enhancement" means the process of improving upon the natural functions and/or values of an area or feature which has been degraded by human activity. Enhancement activities may or may not return the site to a pre-disturbance condition, but create/recreate processes and features that occur naturally.

"Existing manufactured home park or subdivision" means a manufactured home park subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the puring of concrete pads) is completed before the effective date of this chapter.

"Expansion to an existing manufactured home park or subdivision" means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the puring of concrete pads).

"Fill" means any material such as, but not limited to, sand, gravel, soil, rock or gravel that is placed for the purposes of development or redevelopment.

"Flood" or "Flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of inland or tidal waters; and/or
2. The unusual and rapid accumulation of runoff of surface waters from any source.

"Flood Insurance Rate Map" means the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazard and the risk premium zones applicable to the community.

"Flood Insurance Study" means the official report provided by the Federal Insurance Administration that includes flood profiles, the flood boundary-floodway map, and the water surface elevation of the base flood.

"Flood Management Areas" means all lands contained within the 100-year floodplain, flood area and floodway as shown on the Federal Emergency Management Agency Flood Insurance Rate Maps, Floodway Maps and the area of inundation for the February 1996 flood.

17.42.110 Use of other base flood data.
17.42.120 Information to be obtained and maintained.
17.42.130 Alteration of watercourses.
17.42.140 Map administration.
17.42.150 Appeals and variance procedure.
17.42.160 Conditions for variances.
17.42.170 Flood management area standards.
17.42.180 Review of building permits.
17.42.190 Subdivision standards.
17.42.200 Floodways.

17.42.010 Purpose--Findings. There is established in the City a Flood Management Overlay District. The Flood Management Overlay District is an overlay zone classification and all conditions and restrictions of land use established by this chapter of the City's zoning ordinance shall be in addition to such restrictions and conditions as may be imposed and established in underlying zoning districts.

It is the purpose of this chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

A. To protect human life and health;
B. To minimize expenditure of public money and costly flood control;
C. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
D. To minimize prolonged business interruptions;
E. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
F. To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
G. To ensure that potential buyers are notified that property is in an area of special flood hazard; and
H. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.
I. To protect Flood Management Areas, which provide the following functions:
    1. Protect life and property from dangers associated with flooding;
    2. Flood storage, reduction of flood velocities, reduction of flood peak;
    3. Flows and reduction of wind and wave impacts;
    4. Maintain water quality by reducing and sorting sediment loads;
    5. Processing chemical and organic wastes and reducing nutrients, recharge, store and discharge groundwater; and
    6. Provide plant and animal habitat, and support riparian ecosystems.

17.42.020 Definitions. Unless specifically defined below, words and phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application.

"Architect" means an architect licensed by the State of Oregon.

"Area of Special Flood Hazard" means the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. Designation on FEMA maps always includes the letters A or V.

16.08.050 Preliminary Subdivision Plat – Narrative Statement

E. Water Resources. For property subject to Chapter 17.49, the applicant shall submit a report prepared by a qualified professional describing the location and quality of any water quality resource area subject to regulation under Chapter 17.49. This report shall also explain how the proposed subdivision is feasible and meets the applicable requirements of Chapter 17.49. The city engineer may waive any of the foregoing requirements if the city engineer determines that the requirement is unnecessary in the particular case.

Section 6. That Title 16: LAND DIVISIONS, Chapter 16.12: MINIMUM IMPROVEMENTS AND DESIGN STANDARDS FOR LAND DIVISIONS, Section 16.12.330: WATER RESOURCES, is hereby amended to read as follows:

16.12.330 Water Quality Resource Areas

Any land division which contains a Water Quality Resource Area shall comply with the requirements of the Water Quality Resource Area Overlay District, Chapter 17.49, including the requirement, pursuant to 17.49.060, that new subdivisions and partitions delineate and show the Water Quality Resource Area as either a separate tract or part of a larger tract that will not be developed.

Section 7. That Title 16: LAND DIVISIONS, Chapter 16.16: PARTITIONS - - PROCESS AND STANDARDS, SECTION 16.16.030: PARTITION APPLICATION SUBMISSION REQUIREMENTS, Subsection (L) and Subsection (N) are hereby amended to read as follows:

16.16.030 Partition application submission requirements.

L. All areas designated as being within the Flood Management Overlay District regulated under Chapter 17.42.

N. All Water Quality Resource Areas designated and regulated under the Water Quality Resource Area Overlay District in Chapter 17.49.

Section 8. That Title 17: ZONING, Chapter 17.42:F-P FLOODPLAIN OVERLAY DISTRICT is hereby repealed and a new Title 17: ZONING, Chapter 17.42: FLOOD MANAGEMENT OVERLAY DISTRICT is hereby enacted to read as follows:

CHAPTER 17.42

FLOOD MANAGEMENT OVERLAY DISTRICT

Sections:

17.42.010 Purpose--Findings.
17.42.020 Definitions.
17.42.030 Applicability.
17.42.040 Basis for establishing areas of special flood hazard.
17.42.050 Compliance.
17.42.060 Abrogation and greater restrictions
17.42.070 Warning and disclaimer of liability
17.42.080 Severability.
17.42.090 Administration.
17.42.100 Building official--duties and responsibilities.

a. Provide safeguards in connection with development on or adjacent to steep hillsides and landslide areas and other identified known or potential hazard areas, in order to reduce potential hazards to public health, welfare and safety. Such hazards include landslides, mud flows, high ground water tables, soil slump and erosion, which, in turn, may cause siltation or other degradation of quality of waters of the state and damage to public and private property and public facilities.

b. Reduce the direct and indirect costs of these effects, in economic and non-economic terms.

Section 4. That Title 16: LAND DIVISIONS, Chapter 16.08: SUBDIVISIONS – PROCESS AND STANDARDS, Section 16.08.040: PRELIMINARY SUBDIVISION PLAT – REQUIRED PLANS, Subsection (C) and Subsection (D), are hereby amended to read as follows:

16.08.040 Preliminary Subdivision Plat – Required Plans

C. Natural Features Plan and Topography, Preliminary Grading and Drainage Plan. The applicant shall submit a map illustrating all of the natural features and hazards on the subject property and, where practicable, within two hundred and fifty feet of the property's boundary. The map shall also illustrate the approximate grade of the site before and after development. Illustrated features must include all proposed streets and cul-de-sacs, the location and estimated volume of all cuts and fills, and all stormwater management features. This plan shall identify the location of drainage patterns and courses on the site and within two hundred and fifty feet of the property boundaries where practicable. Features that must be illustrated shall include the following:

1. Proposed and existing street rights-of-way and all other transportation facilities;
2. All proposed lots and tracts;
3. All trees with a diameter six inches or greater measured four feet from the ground;
4. All Water Quality Resource Areas pursuant to Chapter 17.49, including all jurisdictional wetlands shown in a delineation according to the Corps of Engineers Wetlands Delineation Manual, January, 1987 edition, and approved by the Division of State Lands and wetlands identified in the City of Oregon Local Wetlands Inventory, adopted by reference in the City of Oregon City comprehensive plan;
5. All known geologic and flood hazards, landslides or faults, areas with a water table within one foot of the surface and all Flood Management Areas pursuant to Chapter 17.42;
6. The location of any known state or federal threatened or endangered species;
7. All historic areas or cultural features acknowledged as such on any federal, state or city inventory;
8. All wildlife habitat or other natural features listed on any of the city's official inventories.

The planning manager may waive any of the foregoing requirements if the planning manager determines that the requirement is unnecessary in the particular case.

D. Erosion and Sediment Control Permit. The applicant shall submit an application for an erosion and sediment control permit pursuant to Chapter 17.47 concurrently with the preliminary subdivision plat application, including an erosion control plan illustrating the measures that will be implemented throughout construction of the subdivision to control erosion and sedimentation, unless waived by the city engineer. This plan must be consistent with all applicable erosion control requirements in Chapter 17.47. Upon consultation with appropriate experts, the city engineer may waive any of the foregoing requirements if the city engineer determines that the requirement is unnecessary in the particular case.

Section 5. That Title 16: LAND DIVISIONS, Chapter 16.08: SUBDIVISIONS – PROCESS AND STANDARDS, Section 16.08.050: PRELIMINARY SUBDIVISION PLAT – NARRATIVE STATEMENT, Subsection (E), is hereby amended to read as follows:

The City of Oregon City, as a co-permittee with Clackamas County, holds a Municipal Separated Sanitary and Storm Sewer (MS-4) NPDES permit for stormwater discharge. The City is required to comply with this permit, specifically the obligation to improve regulations by ordinance for controlling pollution in stormwater runoff.

Current federal and state regulations fall short of adequately protecting water resources from erosion and sediment produced by construction activities. Their major shortcoming is that they only apply to sites larger than five acres. Construction activities that occur on less than five acres are not required to address erosion. Significant erosion problems have been reported from sites smaller than five acres (Woodward-Clyde, 1996). (Reference: Ibid.)

Statewide Planning Goal 6 is "to maintain and improve the quality of air, water and land resources of the state." This goal's guidelines recommend that local governments amend their comprehensive plans to buffer and separate land uses which create or lead to conflicting requirements and impacts on the air, water and land resources. Implementation of the goal involves the adoption of policies that protect water quality, specifically requiring erosion and sediment control.

Existing Regional Requirements

The City is required to comply with Title 3 of the Growth Management Functional Plan. The comprehensive, region-wide erosion and sediment control requirements of Title 3 significantly reduce sediment loading to receiving streams.

Goal

Protect the natural and built environment from the negative impacts of unstable soils, erosion and sediment.

Policies

1. The City shall implement erosion prevention measures and sediment control practices for all development during construction to prevent and restrict the discharge of sediments, and require final permanent erosion prevention measures after development is completed.

2. The City shall adopt standards in the Chapter 17 of the Municipal Code designed to:

    a. Prevent erosion by employing prevention practices such as nondisturbance, construction schedules, erosion blankets and mulch covers; or
    b. Ensure that where erosion cannot be completely avoided, the sediment control measures will be adequate to prevent erosion from entering the public stormwater system, surface water system and Water Qualify Resource Areas; and
    c. Allow no more than a ten- percent cumulative increase in natural stream turbidities, as measured relative to a control point immediately upstream of a turbidity-causing activity. However, limited duration of activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities, and that cause the standard to be exceeded, may be authorized, provided all practical turbidity control techniques have been applied."

3. The City shall adopt standards in Chapter 17 of the Municipal Code designed to:

Section 3. That the Landslides, Weak Foundation Soils and Erosion section of the Natural Hazards element of the Oregon City Comprehensive Plan is hereby repealed and a new Landslides, Weak Foundation Soils and Erosion section of the Natural Hazards element of the Oregon City Comprehensive Plan is enacted to read as follows:

"Discussion

Landslide-prone areas should be evaluated on a site specific basis and should be protected from excavations and/or major vegetation clearing activity that would result in increased slide activity. No mudslide hazard areas have been identified in the Federal Study accompanying flood plain identification.

Construction of buildings and roadways in areas evidencing weak foundation soils should require special development standards in order to eliminate future damages. This should be applied on a site specific basis. Such areas do exist in Oregon City and detailed maps are on file at the Oregon City Planning Department.

During new roadway and structure construction, excavation in landslide-prone areas and weak foundation soils should be avoided to the extent practicable, but excavation of fill and unstable soils is required by building code.

Maintenance of existing vegetation or revegetation should be required for excavation and road slopes for those areas designated as landslide-prone.

These soil hazards can be identified in the report "Soil Survey Interpretations for Oregon City Areas" by the Soil Conservation Service, and in the Clackamas County and State of Oregon inventory maps on file at the Oregon City Planning Department. The City should investigate commissioning a geological survey of the City in the near future and also investigate sources for funding the service.

Erosion is the movement of soil particles caused by man-made or natural disturbances. Erosion produces sediment that moves in suspension from its site of origin by air, water or gravity. Erosion not only causes loss of productive soil, but also damages infrastructure and degrades water quality and aquatic life. When water enters larger slower-moving bodies of water, such as lakes, reservoirs and large rivers, it slows allowing sediment to settle out. Excessive sediment accumulation decreases reservoir storage capacity and increases risks of flooding. Dredging costs are incurred to remove sediment from reservoirs and streams.

Runoff from construction sites is by far the largest source of sediment in developing urban areas. Erosion rates from natural areas, such as undisturbed forested lands, are typically less than one ton/acre/year, while erosion from construction sites ranges from 7.2 to 200 tons/acre/year (EPA, 1993) (Reference: Metro, Growth Management Services Department, "Policy and Scientific Literature Review for Title 3 of the Urban Growth Management Functional Plan: Water Quality and Floodplain Management Conservation", July 1997.)

Existing State and Federal Programs

Federal regulations for erosion control are part of the Clean Water Act. The United States Environmental Protection Agency (USEPA) published final regulations that establish application requirements for National Pollution Discharge Elimination System (NPDES) permits for specific categories of industries and construction activities of five acres or more. The Department of Environmental Quality (DEQ) has written state permitting requirements for industrial and construction activities consistent with the federal rules. In urban areas, DEQ designates a qualified local surface water agency to assume permit insurance responsibility (Reference: Ibid.).

Existing State and Federal Programs

Statewide Planning Goal 7 is "to protect life and property from natural disasters and hazards." The guidelines state that "Development subject to damage or that could result in loss of life shall not be planned nor located in known areas of natural disasters and hazards without appropriate safeguards." Stream flooding is listed among the natural events subject to this Goal. The guidelines go on to state that "In planning for floodplain areas, uses that will not require protection through dams, dikes and levies should be preferred over uses that will require such protection." Implementation for the Goal includes the recommendation that cities and counties not already eligible should qualify for inclusion in the National Flood Insurance Program.

With passage of the Flood Control Act of 1936, the federal government has dominated the nation's flood damage reduction efforts. The primary federal tool to address flood hazard management is the National Flood Insurance Program (NFIP). The U.S. Congress initiated the NFIP in 1968 to provide low cost insurance to communities that have adopted approved floodplain management regulations. The program is administered by the Federal Insurance Agency (FIA) which is part of the Federal Emergency Management Agency (FEMA). NFIP requires communities to adopt a local floodplain management ordinance approved by FEMA. The ordinance is based on the Flood Insurance Rate Map (FIRM). Flood risk is determined and insurance rates are set for mapped floodplain areas. In designating flood plain areas, FEMA has conducted studies that delineate land areas needed to hold anticipated water volumes resulting from 100-year flood conditions.

Existing Regional Requirements

The City is required to comply with Title 3 of the Growth Management Functional Plan. This title includes standards for floodplains that require balanced cut and fill and the expansion of flood management areas to include the boundary of historic floods and not just the Federal Emergency Management Agency 100-year floodplain.

Goal

To assure that urban land use activities are planned, located and conducted consistently with the best available information and technology, so that the risk of flood damage is minimized.

Policies

1. The City shall adopt standards in the Chapter 17 of the Municipal Code designed to protect Flood Management Areas, which provide the following functions:
   a. Protect life and property from dangers associated with flooding;
   b. Flood storage, reduction of flood velocities, reduction of flood peak;
   c. Flows and reduction of wind and wave impacts;
   d. Maintain water quality by reducing and sorting sediment loads;
   e. Processing chemical and organic wastes and reducing nutrients;
   f. Recharge, store and discharge groundwater; and
   g. Provide plant and animal habitat, and support riparian ecosystems.

2. The City shall maintain and, when necessary, update the flood management standards of the Municipal Code, consistent with federal, state and regional regulations, and the Uniform Building Code (UBC).

3. The City shall retain qualification in the National Flood Insurance Program through implementation of a full range of floodplain management measures."

a. provide a vegetated corridor to separate Protected Water Features from development;
b. maintain or reduce stream temperatures;
c. maintain natural stream corridors;
d. minimize erosion and nutrient and pollutant loading into water; and
e. filter, provide infiltration and natural water purification.

5. The City shall conserve domestic groundwater and surface water resources from potential pollution through a variety of regulatory measures relating to land use, transportation, and hazardous substances.
6. The City shall conserve wetlands, riparian areas and water bodies which have functions and values related to flood protection, sediment and erosion control, water quality, groundwater recharge and discharge, education, vegetation and fish and wildlife habitat. Regulate development within water bodies, riparian areas, and wetlands to retain their important functions and values.

Section 2. That the Flood Plain section of the Natural Hazards Element of the Oregon City Comprehensive Plan is hereby repealed and a new Flood Management section of the Natural Hazards Element of the Oregon City Comprehensive Plan is hereby enacted to read as follows:

"Discussion

Flooding is a problem in the Portland metropolitan region and is expected to become worse as the region grows. Cost estimates of the February 1996 flood and landslide disaster in the entire tri-county region (which includes Clackamas, Multnomah and Washington counties) were almost $60 million dollars (Oregon Emergency Management Office, 1997) (Reference: Metro, Growth Management Services Department, "Policy and Scientific Literature Review for Title 3 of the Urban Growth Management Functional Plan: Water Quality and Floodplain Management Conservation", July 1997). Within the City of Oregon City there are areas which are subject to the periodic presence of surface water as a result of flooding. These flood management areas are associated with several rivers and streams, including the Willamette River, the Clackamas River, and Abernethy Creek. In terms of managing these areas there are two important issues: the degree of hazard to life and property and the preservation of natural function and value of the stream corridors as drainageways. A precise map of flood plain boundaries as approved by the US Department of Housing and Urban Development (HUD), is on file in City Hall.

Costs associated with flooding have grown exponentially in recent years, not necessarily because floods are any larger or more frequent. Rather it is because of human development in the floodplain where rivers will eventually return. Flooding is a natural process that helps restore a river's health, clean its sediments, create critical aquatic and streamside habitat, exchange nutrients between the river and its floodplain and renew its fisheries. Floods clean out accumulations of large wood. Floods also bring leaves, needles, wood and dissolved nutrients into the river giving aquatic communities access to new habitats and increased food supplies (Orsinger and Gregory, 1996) (Reference: Metro, Growth Management Services Department, "Policy and Scientific Literature Review for Title 3 of the Urban Growth Management Functional Plan: Water Quality and Floodplain Management Conservation", July 1997).

Floodplains in their natural or relatively undisturbed state provide numerous beneficial natural resource functions and values, including:

a. Moderation of floods, flood storage, water quality maintenance and groundwater recharge,
b. Habitat value for plants and animals, and
c. Scientific, historic, agricultural, recreational and aesthetic values (FEMA, 1992). (Reference: Ibid.)

Statewide Planning Goal 6 is "to maintain and improve the quality of the air, water and land resources of the state." Establishing water quality protection is consistent with this goal as it sets standards for water quality protection, specifically requiring erosion and sediment control, vegetative retention, and prohibiting new uses of uncontained hazardous materials.

Statewide Planning Goal 7 is "to protect life and property from natural disasters and hazards." Implementing water quality controls is consistent with Goal 7 as it sets standards to protect against flooding and prevent or reduce risk to human life and properties.

Statewide Planning Goal 5 is "to protect natural resources, and conserve scenic historic areas and open space." The City of Oregon City's adoption of its Local Wetlands Inventory (October 1998) addresses Goal 5.

Existing Regional Requirements

The City is required to comply with Title 3 of the Growth Management Functional Plan. This title includes standards that promote more effective land use practices to protect water quality by establishing standards for protecting vegetated corridors. Additionally, Title 3's performance standards may also be used to meet DEQs TMDL requirements. By complying with Title 3, TMDLs may not have to be developed. Where TMDLs have been established or will be required, a watershed planning process may be initiated (DEQ, 1997).

Inventory of Wetlands and Water Resources

In 1989, Oregon State Legislature authorized the Department of State Lands (DSL) to develop a statewide wetlands inventory suitable for planning and regulatory purposes. Pursuant to ORS 196.674, in 1994 the DSL established Local Wetland Inventory (LWI) standards and guidelines. The purpose of an LWI is to locate, map, and classify wetlands by type (such as forested wetlands) over a relatively large geographic area. In accordance with LWI standards, the approximate boundaries of all wetlands at least 0.5 acre in size are identified on an inventory. The City of Oregon City recently (October 1998) had a Local Wetland Inventory and Riparian Assessment prepared. The LWI includes wetland delineations approved by the DSL and Corps of Engineers, which were confirmed within the last ten years.

Goal

Enhance the quality of life by protecting water resources and working to maintain and improve water quality.

Policies

1. The City shall protect and improve the beneficial water uses and functions and values of Water Quality Resource Areas through the protection of vegetated corridors along protected water features.

2. The City shall adopt the City of Oregon City Local Wetland Inventory (LWI) by reference into the Comprehensive Plan. The LWI shall provide a resource and a reference about the location of wetlands in Oregon City.

3. The City shall establish a Water Quality Resource Area Overlay District based on the Metro Water Quality and Flood Management Area maps.

4. The City shall adopt standards in Chapter 17 of the Municipal Code designed to protect Water Quality Resource Areas. The purpose of these standards is to:

WHEREAS, the City will continue to monitor the balance between the purposes of this ordinance and the City's overall supply of land available for housing opportunities.

Now, therefore,

OREGON CITY ORDAINS AS FOLLOWS:

Section 1. That Ordinance 93-1007, An Ordinance Amending the Natural Resources Element of the Comprehensive Plan is repealed and a new Water Resources section of the Natural Resources Element of the Oregon City Comprehensive Plan is hereby enacted to read as follows:

"Discussion

As discussed in the Metro Growth Management Services Department, "Policy and Scientific Literature Review for Title 3 of the Urban Growth Management Functional Plan: Water Quality and Floodplain Management Conservation" (July 1997), the Department of Environmental Quality (DEQ) has identified 34 stream/river segments (over 213 miles) and lakes in the Metro region that do not meet water quality standards. In the early 1990's, most jurisdictions had taken some steps to protect water resources (e.g. requiring a buffer along streams and wetlands). However, development prior to that time was not subject to current requirements. As a result, many stream and wetland corridors are degraded or developed completely. It is important to protect the remaining vegetated corridors and re-vegetate wherever practicable.

The management of water quality involves several factors, which include the following:

1. Maintenance or reduction of water temperature;
2. Stream/Channel stability;
3. Sediment reduction;
4. Excess nutrient and metal removal; and
5. Moderation of stormwater runoff

Vegetated corridors provide many functions to promote water quality. They help stabilize temperatures in streams and wetlands, while providing channel stability, which enables streams to retain their structure and function. Vegetated corridors filter the flow of sediment and debris, stabilize streambanks and wetland edges and promote infiltration. They can remove metals and excess nutrients from runoff and overland flow by filtering water, via plant uptake, and microbial activity. Finally, vegetated corridors can moderate seasonal water level fluctuations in streams and wetlands as they slow the flow of runoff and allow it to percolate into the ground.

Existing State and Federal Programs

The goal of the 1977 Federal Clean Water Act (CWA) is to maintain and restore the physical, chemical and biological integrity of waters in the United States. The CWA prohibits discharges of pollutants into waters of the United States, unless the discharge is in compliance with a National Discharge Elimination System (NPDES) permit. In Oregon, the CWA is implemented by Department of Environmental Quality (DEQ) with review and approval by the United States Environmental Protection Agency (EPA).

The Department of Environmental Quality (DEQ) has established standards that apply to Total Maximum Daily Loads (TMDLs) for pollutants. It has applied the standards to the Tualatin River and is developing TMDLs and a management strategy for the Columbia Slough (DEQ, 1994). TMDLs for dioxin have been set for the Willamette and Columbia Rivers. Management plans have not been developed for any of the other listed waterbodies in the state.

Section 404 of the Federal Clean Water Act authorizes the Army Corps of Engineers to regulate dredging and filling into the "waters of the United States." The term "waters of the United States" has been defined broadly to include virtually all surface waters, regardless of their size. In Oregon, the state Removal/Fill Law gives the Division of State Lands (DSL) similar authority. To fill or dredge a wetland area in Oregon, permits are required from both the Army Corps of Engineers (Corps) and DSL.

WHEREAS, by providing comprehensive protection standards and more detailed resource mapping and inventory information, the amendments support the Comprehensive Plan goal of preserving and managing our scarce natural resources while building a livable urban environment; and

WHEREAS, the public has been involved in the process of adopting these amendments through a City Commission and Planning Commission joint work session on March 31, 1999, through post cards that were sent to all property owners with a Title 3 mapped resource and through a public open house held on May 10, 1999, and through Planning Commission public hearings on June 14 and June 28, 1999; and

WHEREAS, mapping has inherent limitations that prevent complete accuracy in locating water features and natural processes may result in a shift in the location of a protected water features, it is necessary to create an overlay district sufficiently large to assure complete protection of the water feature; and

WHEREAS, at least 68 individuals and seven agency representatives attended the March 31, 1999 work session, the May 10, 1999 public open house, or the June 14 and June 28, 1999 Planning Commission public hearings, and participated in providing comments and feedback that helped to guide the ordinance to its current form; and

WHEREAS, the notification requirement of Measure 56 was complied with by the mailing of notice to all property owners of record within the City limits as well as to all property owners of record outside the City limits but inside the City's urban growth boundary; and

WHEREAS, the proposed ordinance will set standards to protect against flooding and prevent or reduce risk to human life or properties, specifically prohibiting or limiting development in flood prone areas, requiring balanced cut and fill, requiring minimum finished floor elevations to be at least one foot above design flood heights, requiring removal of any temporary fill, and other standards that help to protect against the loss of life or property from flood damage; and

WHEREAS, by helping to protect the waters of the state, the proposed ordinance protects a valuable economic resource and helps to maintain the overall economic health of the City. If the City's waters are degraded, higher costs will be incurred for testing and treating drinking water, and businesses may move away from the degraded waters; recreation may be inhibited, and fish and wildlife may be harmed; and

WHEREAS, floods have significant economic impacts: for example, the costs of the February 1996 flooding in the Portland metro region have been estimated at almost $60 million in a 1997 report by the Oregon Emergency Management Office; and

WHEREAS, by helping to protect property from dangers associated with flooding and by helping to stabilize slopes to protect existing buildings, the ordinance will protect the existing supply of housing and prevent new housing from being built in an inappropriate manner; and

WHEREAS, by helping to protect property from dangers associated with flooding and by helping to stabilize slopes to prevent landslides, the ordinance will protect existing transportation facilities and prevent new transportation facilities from being built in an inappropriate manner; and

WHEREAS, the overlay districts created by this ordinance incorporate vacant, constrained land consisting of floodplains, slopes of over 25 percent, flood-prone soils, wetlands, parks, and water features such as lakes, rivers, and streams, said lands being omitted from designation as land on which the City is obligated to provide for housing opportunities only; and

WHEREAS, the City has determined that buildable lands for housing opportunities are available, and can be made available over time, outside the boundaries of the water quality overlay districts created by this ordinance; and

WHEREAS, housing opportunities are available within the water quality overlay districts created by this ordinance on a site-by-site basis; and

ORDINANCE NO. 99-1013 COPY

AN ORDINANCE AMENDING THE NATURAL RESOURCES ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN BY REPEALING ORDINANCE NO. 93-1007 AND ADOPTING A NEW WATER RESOURCES SECTION OF THE NATURAL RESOURCES ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN; DELETING THE FLOOD PLAIN SECTION OF THE NATURAL HAZARDS ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN AND ADOPTING A NEW FLOOD MANAGEMENT SECTION OF THE NATURAL HAZARDS ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN; DELETING THE LANDSLIDES, WEAK FOUNDATION SOILS AND EROSION SECTIONS OF THE NATURAL HAZARDS ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN AND ADOPTING A NEW LANDSLIDES, WEAK FOUNDATION SOILS AND EROSION SECTIONS OF THE NATURAL HAZARDS ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN; AMENDING THE NATURAL RESOURCES GOALS AND POLICIES SECTION OF THE COMPREHENSIVE PLAN BY ADDING NEW TEXT; AND

AMENDING TITLE 16: LAND DIVISIONS, CHAPTER 16.08: SUBDIVISIONS--PROCESS AND STANDARDS, SUBSECTION 16.08.040: PRELIMINARY SUBDIVISION PLAT--REQUIRED PLANS, OF THE OREGON CITY MUNICIPAL CODE OF 1991, BY AMENDING SUBSECTION (C); AMENDING TITLE 16; LAND DIVISIONS, CHAPTER 16.08: SUBDIVISIONS--PROCESS AND STANDARDS, SECTION 16.08.050: PRELIMINARY SUBDIVISION PLAT--NARRATIVE STATEMENT, BY AMENDING SUBSECTION (E); AMENDING TITLE 16: LAND DIVISIONS, CHAPTER 16.12: MINIMUM IMPROVEMENTS AND DESIGN STANDARDS FOR LAND DIVISIONS; SECTION 16.12.330: WATER RESOURCES; AMENDING TITLE 16: LAND DIVISIONS, CHAPTER 16.16: PARTITIONS--PROCESS AND STANDARDS; SECTION 16.16.030: PARTITION APPLICATION SUBMISSION REQUIREMENTS, SUBSECTIONS (L) AND (N); DELETING TITLE 17: ZONING, CHAPTER 17.42: F-P FLOODPLAIN OVERLAY DISTRICT AND ENACTING A NEW TITLE 17: ZONING, CHAPTER 17.42: FLOOD MANAGEMENT OVERLAY DISTRICT; DELETING TITLE 17: ZONING, CHAPTER 17.47: EROSION CONTROL, AND ENACTING A NEW TITLE 17: ZONING, CHAPTER 17.47: EROSION AND SEDIMENT CONTROL; DELETING TITLE 17: ZONING, CHAPTER 17.49: WR WATER RESOURCES OVERLAY DISTRICT AND ENACTING A NEW TITLE 17: ZONING, CHAPTER 17.49: WATER QUALITY RESOURCE AREA OVERLAY DISTRICT, AND DECLARING AN EMERGENCY

OREGON CITY MAKES THE FOLLOWING FINDINGS

WHEREAS, on June 18, 1998, Metro adopted Title 3: Water Quality, Flood Management and Fish and Wildlife Conservation, of Metro's Urban Growth Management Functional Plan, which requires cities within Metro's jurisdiction to comply with certain requirements involving Water Quality, Flood Management and Erosion Control; and

WHEREAS, the Planning Commission and City Commission requested a review of the City of Oregon City's Comprehensive Plan and Municipal Code for compliance with the requirements of Metro Title 3 and, in addition, compliance with the Oregon Division of State Lands standards and guidelines for local wetlands inventories; and

WHEREAS, the current Comprehensive Plan and Municipal ordinances, while addressing many of the same issues, do not fully comply with the requirements of Metro Title 3 and the Division of State Lands standards and guidelines; and

WHEREAS, a public need to protect water resources and address flood management has been identified at the federal, state, regional and local levels and that need has been specifically expressed in the Federal Clean Water Act, the Federal Flood Control Act, Statewide Planning Goal 6, Statewide Planning Goal 7, Title 3 of Metro's Urban Growth Functional Plan and the existing Oregon City Comprehensive Plan; and

WHEREAS, Oregon City has recently completed a Local Wetlands Inventory, prepared with guidance from the Division of State Lands and that inventory has resulted in a more complete and accurate inventory of wetlands in the City; and



CITY OF OREGON CITY
P.O. Box 351
Oregon City, OR 97045-0021
Address Correction Requested

New Pioneer Spirit

DLCD

ATTENTION: Plan Amendment Spec
635 CAPITOL ST NE, Suite 150
SALEM OR 97301-2540

END OF THE OREGON TRAIL - BEGINNING OF OREGON HISTORY

PLAN AMENDMENT TRACKING SHEET

AMENDMENT PROPOSED 9962

Jurisdiction : OREGON CITY
Jurisdiction Abbrev : COREGO
DLCD File No : 010-99 Local File No : PZ98-04

Proposal Summary :

Amend the comprehensive plan and the Municipal Code to (1) include "Landslides, Weak Foundation Soils and Erosion" in the Natural Resources Element Section; (2) Implement the requirements of Title 3 of the Urban Growth Mangement Functional Plan; (3) Adopt the Metro Water Quality and Flood Management Areas Model Ordinance and Map into Title 17 of the City Code; and (4) Adopt the draft of Local Wetland Inventory and Riparian Assessment.

Locally Identified Affected Agencies:

Army Corps of Engineers, Oregon Division of State Lands.

Proposal Received : 5/17/1999
Local Contact: Nancy Krashaar 503-657-0891 EXT :
Field Representative : MF
Days Notice : 50
Final Hearing : 7/6/1999
AS Supervisor : JH
Number of Amendments :

Notice of Proposed Amendment :

PROPOSAL REVIEW

DLCD Notice of Participation :
Department Participation : Y

Goals:

Reviewer : MF / AB
Final Due : 06/11/99
Response Sent : 6/11
Response Type : letter (copy in plan file)
Time Spent on Review : 1 # hours
Mail Deadline : 06/14/99
Fax Deadline : 06/21/99

recommended several changes to section 2

Oregon
John A. Kitzhaber, M.D., Governor

Department of Land Conservation and Development
635 Capitol St. NE, Suite 200
Salem, Oregon 97301-2540
Phone (503) 373-0050
Director's Fax (503) 378-5518
Main Fax (503) 378-6033
Rural/Coastal Fax (503) 378-5518
TGM/Urban Fax (503) 378-2687
Web Address: http://www.lcd.state.or.us

June 11, 1999

Nancy Kraushaar
320 Warner Milne Road
Oregon City, Oregon 97045

Dear Ms. Kraushaar:

Thank you for the opportunity to review the proposed amendment to Oregon City's Comprehensive Plan and Municipal Code. I reviewed section 2 (proposed comprehensive plan amendments for flood management) and section 3 (proposed comprehensive plan amendments for water quality).

Flood Management Ordinance

Definitions

In order to ensure that your floodplain management program is consistent with the minimum National Flood Insurance Program requirements, you need to add the following definitions to the definition section (section 17.42.020) of your ordinance.

- Basement
- Substantial Improvement -- FEMA has revised their definition of "substantial improvement" to clarify that the provision excludes improvements made to comply with existing building codes.
- Recreational Vehicles (distinguished from manufactured homes)

A copy of the Oregon Model Floodplain Development Ordinance is attached for your review. Recommended definitions are found at pages 3-7.

Applicability

I discussed subsection B. of the Applicability section (17.42.030) with Mark Eberlein, the Oregon contact at the Federal Emergency Management Agency (FEMA). We both recommend deleting this subsection. As drafted, it is inconsistent with the overall goals of the National Flood Insurance Program. We could support this type of provision only if it was rewritten to apply exclusively to work necessary to protect existing structures. Activities to repair, maintain or replace structures could not be excluded from floodplain management standards and requirements. The time frame for the exemption for protective activities would also need to be limited to a specific length of time (beginning with the emergency being "declared" and ending with a return to non-emergency conditions). Finally, once the emergency passed, all

development undertaken to protect existing structures would need to meet the prescribed standards of Chapter 17.42. Deleting this subsection would help ensure that your ordinance is consistent with the minimum National Flood Insurance Program requirements.

Flood Management Area Standards (section 17.42.170)

Subsection A may need to be modified. In many situations, stream restoration activities take place in the regulatory floodway of streams. When this is the case, the floodway provisions of your ordinance (section 17.42.200) apply. You might want to caveat this exemption to indicate that a permit will be required if the restoration project encroaches on the floodway. In order to promote stream restoration activities, the Federal Emergency Management Agency has adopted a policy relating to restoration activities in floodways. I have attached a copy of the policy for your information.

Several modifications need to be made to the construction standards (section 17.42.170.E).

- In section 5 (residential construction) it is not clear whether the elevation is at least one foot above the base flood elevation or the design flood elevation.

- Section 7 (manufactured homes) must be changed to reflect the State Building Codes requirement that such structures be elevated at least one foot above the base flood elevation.

- You may want to add a section that specifically applies to recreational vehicles (see page 16-17 of the model ordinance).

Water Quality

The proposed amendments to your water quality ordinance appear to be consistent with the standards established in Title 3 of Metro's Growth Management Functional Plan.

If you have any questions, please contact me at 503-373-0050 extension 255.

Sincerely,

A Beier

Ann Beier
State Floodplain Program Manager

cc: Mark Eberlein, Federal Emergency Management Agency Region X
Meg Fernekees, Department of Land Conservation and Development
Dennis Sigrist, Oregon Emergency Management
Plan Review File

enclosure

NOTICE OF PROPOSED AMENDMENT

This form must be received by DLCD at least 45 days prior to the final hearing
ORS 197.610 and OAR Chapter 660, Division 18

See reverse side for submittal requirements

DEPT OF
MAY 17 1999
LAND CONSERVATION
AND DEVELOPMENT

Jurisdiction City of Oregon City

Date of Final Hearing July 7, 1999 Local File # PZ98-04

Has this proposal been previously submitted to DLCD? ___ Yes _x_ No _____ Date

XX Comprehensive Plan Text Amendment
XX Land Use Regulation Amendment
XX New Land Use Regulation
XX Comprehensive Plan Map Amendment
XX Zoning Map Amendment

Briefly summarize the proposal. Do not use technical terms. Do not write "See Attached."

Implement the requirements of Title 3 of the urban growth management functional plan by adopting the Metro Water Quality and Flood Management Areas Model Ordinance and Map into Title 17 of the City's Code.

Adopt draft local wetland inventory

Plan Map Change From NA to NA

Zone Map Change From NA to NA

Location: Citywide Acres Involved _____

Specify Density: Previous Density NA New Density NA

Applicable Goals: Goal 5 Was an Exception adopted? ___ Yes X No

Affected State or Federal Agencies, Local Governments or Special Districts:

Division of State Lands, Army Corps of Engineers

Local Contact: Nancy Kraushaar Phone: 657-0891

Address: 320 Warner Milne Road, Oregon City, Oregon

DLCD File # 010-99 (9962) Date Rec'd _____ # Days Notice _____

CITY OF OREGON CITY
Incorporated 1844
320 Warner Milne Road | Oregon City, Oregon 97045
Tel 657-0891 | Fax 657-7892

MEMORANDUM

To: City Commission and Planning Commission
From: Nancy J.T. Kraushaar, P.E., Senior Engineer
Date: May 14, 1999
Subject: Materials for May 26, 1999 Work Session

City Commissioners and Planning Commissioners, please note:

The following materials are enclosed in this packet for your information and review prior to the **May 26, 1999 work session**:

1. REVIEW DRAFT, Title 3 Compliance Staff Report and Proposed Comprehensive Plan and Municipal Code Amendments

In the past, in preparation for the March 31, 1999 work session, you recieved the following in a blue folder packet for reference during the Title 3 compliance process:

1. Metro Title 3 Model Ordinance
2. Oregon City Erosion Control Ordinance (OCMC Chapter 17.47)
3. Oregon City "WR" Water Resources Overlay District (OCMC Chapter 17.49)
4. Oregon City "WRG" Willamette River Greenway Overlay District (OCMC Chapter 17.48)

W&H Pacific will assist staff during the work session. We will discuss your questions and suggested revisions regarding the proposed Comprehensive Plan and Municipal Code amendments. If you need additional copies of any of the above materials or if you have any questions about the work session or the enclosed materials, please call me. **Because of the magnitude of the materials to be covered at the meeting, the mayor requested that you read the REVIEW DRAFT and come to the work session with your comments for discussion and/or inclusion in the documents.** We will not go over the text word by word, but will try to focus on issues of concern and discussion that you bring to the work session.

Thank you very much.

c: Chris Jordan, Interim City Manager; Bryan Cosgrove, Interim Community Development Director; Barbara Shields, Senior Planner; Paul Espe, Associate Planner; Dean Norlin, Senior Engineer.

ORDINANCE NO. 99-1013

AN ORDINANCE AMENDING THE NATURAL RESOURCES ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN BY REPEALING ORDINANCE NO. 93-1007 AND ADOPTING A NEW WATER RESOURCES SECTION OF THE NATURAL RESOURCES ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN; DELETING THE FLOOD PLAIN SECTION OF THE NATURAL HAZARDS ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN AND ADOPTING A NEW FLOOD MANAGEMENT SECTION OF THE NATURAL HAZARDS ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN; DELETING THE LANDSLIDES, WEAK FOUNDATION SOILS AND EROSION SECTIONS OF THE NATURAL HAZARDS ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN AND ADOPTING A NEW LANDSLIDES, WEAK FOUNDATION SOILS AND EROSION SECTIONS OF THE NATURAL HAZARDS ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN; AMENDING THE NATURAL RESOURCES GOALS AND POLICIES SECTION OF THE COMPREHENSIVE PLAN BY ADDING NEW TEXT; AND

AMENDING TITLE 16: LAND DIVISIONS, CHAPTER 16.08: SUBDIVISIONS--PROCESS AND STANDARDS, SUBSECTION 16.08.040: PRELIMINARY SUBDIVISION PLAT--REQUIRED PLANS, OF THE OREGON CITY MUNICIPAL CODE OF 1991, BY AMENDING SUBSECTION (C); AMENDING TITLE 16; LAND DIVISIONS, CHAPTER 16.08: SUBDIVISIONS--PROCESS AND STANDARDS, SECTION 16.08.050: PRELIMINARY SUBDIVISION PLAT--NARRATIVE STATEMENT, BY AMENDING SUBSECTION (E); AMENDING TITLE 16: LAND DIVISIONS, CHAPTER 16.12: MINIMUM IMPROVEMENTS AND DESIGN STANDARDS FOR LAND DIVISIONS; SECTION 16.12.330: WATER RESOURCES; AMENDING TITLE 16: LAND DIVISIONS, CHAPTER 16.16: PARTITIONS--PROCESS AND STANDARDS; SECTION 16.16.030: PARTITION APPLICATION SUBMISSION REQUIREMENTS, SUBSECTIONS (L) AND (N); DELETING TITLE 17: ZONING, CHAPTER 17.42: F-P FLOODPLAIN OVERLAY DISTRICT AND ENACTING A NEW TITLE 17: ZONING, CHAPTER 17.42: FLOOD MANAGEMENT OVERLAY DISTRICT; DELETING TITLE 17: ZONING, CHAPTER 17.47: EROSION CONTROL, AND ENACTING A NEW TITLE 17: ZONING, CHAPTER 17.47: EROSION AND SEDIMENT CONTROL; DELETING TITLE 17: ZONING, CHAPTER 17.49: WR WATER RESOURCES OVERLAY DISTRICT AND ENACTING A NEW TITLE 17: ZONING, CHAPTER 17.49: WATER QUALITY RESOURCE AREA OVERLAY DISTRICT, AND DECLARING AN EMERGENCY

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WHEREAS, the Planning Commission and City Commission requested a review of the City of Oregon City's Comprehensive Plan and Municipal Code for compliance with the requirements of Metro Title 3 and, in addition, compliance with the Oregon Division of State Lands standards and guidelines for local wetlands inventories; and

WHEREAS, the current Comprehensive Plan and Municipal ordinances, while addressing many of the same issues, do not fully comply with the requirements of Metro Title 3 and the Division of State Lands standards and guidelines; and

WHEREAS, a public need to protect water resources and address flood management has been identified at the federal, state, regional and local levels and that need has been specifically expressed in the Federal Clean Water Act, the Federal Flood Control Act, Statewide Planning Goal 6, Statewide Planning Goal 7, Title 3 of Metro's Urban Growth Functional Plan and the existing Oregon City Comprehensive Plan; and

WHEREAS, Oregon City has recently completed a Local Wetlands Inventory, prepared with guidance from the Division of State Lands and that inventory has resulted in a more complete and accurate inventory of wetlands in the City; and

ORDINANCE NO. 99-1013

AN ORDINANCE AMENDING THE NATURAL RESOURCES ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN BY REPEALING ORDINANCE NO. 93-1007 AND ADOPTING A NEW WATER RESOURCES SECTION OF THE NATURAL RESOURCES ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN; DELETING THE FLOOD PLAIN SECTION OF THE NATURAL HAZARDS ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN AND ADOPTING A NEW FLOOD MANAGEMENT SECTION OF THE NATURAL HAZARDS ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN; DELETING THE LANDSLIDES, WEAK FOUNDATION SOILS AND EROSION SECTIONS OF THE NATURAL HAZARDS ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN AND ADOPTING A NEW LANDSLIDES, WEAK FOUNDATION SOILS AND EROSION SECTIONS OF THE NATURAL HAZARDS ELEMENT OF THE OREGON CITY COMPREHENSIVE PLAN; AMENDING THE NATURAL RESOURCES GOALS AND POLICIES SECTION OF THE COMPREHENSIVE PLAN BY ADDING NEW TEXT; AND

AMENDING TITLE 16: LAND DIVISIONS, CHAPTER 16.08: SUBDIVISIONS--PROCESS AND STANDARDS, SUBSECTION 16.08.040: PRELIMINARY SUBDIVISION PLAT--REQUIRED PLANS, OF THE OREGON CITY MUNICIPAL CODE OF 1991, BY AMENDING SUBSECTION (C); AMENDING TITLE 16; LAND DIVISIONS, CHAPTER 16.08: SUBDIVISIONS--PROCESS AND STANDARDS, SECTION 16.08.050: PRELIMINARY SUBDIVISION PLAT--NARRATIVE STATEMENT, BY AMENDING SUBSECTION (E); AMENDING TITLE 16: LAND DIVISIONS, CHAPTER 16.12: MINIMUM IMPROVEMENTS AND DESIGN STANDARDS FOR LAND DIVISIONS; SECTION 16.12.330: WATER RESOURCES; AMENDING TITLE 16: LAND DIVISIONS, CHAPTER 16.16: PARTITIONS--PROCESS AND STANDARDS; SECTION 16.16.030: PARTITION APPLICATION SUBMISSION REQUIREMENTS, SUBSECTIONS (L) AND (N); DELETING TITLE 17: ZONING, CHAPTER 17.42: F-P FLOODPLAIN OVERLAY DISTRICT AND ENACTING A NEW TITLE 17: ZONING, CHAPTER 17.42: FLOOD MANAGEMENT OVERLAY DISTRICT; DELETING TITLE 17: ZONING, CHAPTER 17.47: EROSION CONTROL, AND ENACTING A NEW TITLE 17: ZONING, CHAPTER 17.47: EROSION AND SEDIMENT CONTROL; DELETING TITLE 17: ZONING, CHAPTER 17.49: WR WATER RESOURCES OVERLAY DISTRICT AND ENACTING A NEW TITLE 17: ZONING, CHAPTER 17.49: WATER QUALITY RESOURCE AREA OVERLAY DISTRICT, AND DECLARING AN EMERGENCY

OREGON CITY MAKES THE FOLLOWING FINDINGS

WHEREAS, on June 18, 1998, Metro adopted Title 3: Water Quality, Flood Management and Fish and Wildlife Conservation, of Metro's Urban Growth Management Functional Plan, which requires cities within Metro's jurisdiction to comply with certain requirements involving Water Quality, Flood Management and Erosion Control; and

WHEREAS, the Planning Commission and City Commission requested a review of the City of Oregon City's Comprehensive Plan and Municipal Code for compliance with the requirements of Metro Title 3 and, in addition, compliance with the Oregon Division of State Lands standards and guidelines for local wetlands inventories; and

WHEREAS, the current Comprehensive Plan and Municipal ordinances, while addressing many of the same issues, do not fully comply with the requirements of Metro Title 3 and the Division of State Lands standards and guidelines; and

WHEREAS, a public need to protect water resources and address flood management has been identified at the federal, state, regional and local levels and that need has been specifically expressed in the Federal Clean Water Act, the Federal Flood Control Act, Statewide Planning Goal 6, Statewide Planning Goal 7, Title 3 of Metro's Urban Growth Functional Plan and the existing Oregon City Comprehensive Plan; and

WHEREAS, Oregon City has recently completed a Local Wetlands Inventory, prepared with guidance from the Division of State Lands and that inventory has resulted in a more complete and accurate inventory of wetlands in the City; and

WHEREAS, by providing comprehensive protection standards and more detailed resource mapping and inventory information, the amendments support the Comprehensive Plan goal of preserving and managing our scarce natural resources while building a livable urban environment; and

WHEREAS, the public has been involved in the process of adopting these amendments through a City Commission and Planning Commission joint work session on March 31, 1999, through post cards that were sent to all property owners with a Title 3 mapped resource and through a public open house held on May 10, 1999, and through Planning Commission public hearings on June 14 and June 28, 1999; and

WHEREAS, mapping has inherent limitations that prevent complete accuracy in locating water features and natural processes may result in a shift in the location of a protected water features, it is necessary to create an overlay district sufficiently large to assure complete protection of the water feature; and

WHEREAS, at least 68 individuals and seven agency representatives attended the March 31, 1999 work session, the May 10, 1999 public open house, or the June 14 and June 28, 1999 Planning Commission public hearings, and participated in providing comments and feedback that helped to guide the ordinance to its current form; and

WHEREAS, the notification requirement of Measure 56 was complied with by the mailing of notice to all property owners of record within the City limits as well as to all property owners of record outside the City limits but inside the City's urban growth boundary; and

WHEREAS, the proposed ordinance will set standards to protect against flooding and prevent or reduce risk to human life or properties, specifically prohibiting or limiting development in flood prone areas, requiring balanced cut and fill, requiring minimum finished floor elevations to be at least one foot above design flood heights, requiring removal of any temporary fill, and other standards that help to protect against the loss of life or property from flood damage; and

WHEREAS, by helping to protect the waters of the state, the proposed ordinance protects a valuable economic resource and helps to maintain the overall economic health of the City. If the City's waters are degraded, higher costs will be incurred for testing and treating drinking water, and businesses may move away from the degraded waters; recreation may be inhibited, and fish and wildlife may be harmed; and

WHEREAS, floods have significant economic impacts: for example, the costs of the February 1996 flooding in the Portland metro region have been estimated at almost $60 million in a 1997 report by the Oregon Emergency Management Office; and

WHEREAS, by helping to protect property from dangers associated with flooding and by helping to stabilize slopes to protect existing buildings, the ordinance will protect the existing supply of housing and prevent new housing from being built in an inappropriate manner; and

WHEREAS, by helping to protect property from dangers associated with flooding and by helping to stabilize slopes to prevent landslides, the ordinance will protect existing transportation facilities and prevent new transportation facilities from being built in an inappropriate manner; and

WHEREAS, the overlay districts created by this ordinance incorporate vacant, constrained land consisting of floodplains, slopes of over 25 percent, flood-prone soils, wetlands, parks, and water features such as lakes, rivers, and streams, said lands being omitted from designation as land on which the City is obligated to provide for housing opportunities only; and

WHEREAS, the City has determined that buildable lands for housing opportunities are available, and can be made available over time, outside the boundaries of the water quality overlay districts created by this ordinance; and

WHEREAS, housing opportunities are available within the water quality overlay districts created by this ordinance on a site-by-site basis; and

WHEREAS, the City will continue to monitor the balance between the purposes of this ordinance and the City's overall supply of land available for housing opportunities.

Now, therefore,

OREGON CITY ORDAINS AS FOLLOWS:

Section 1. That Ordinance 93-1007, An Ordinance Amending the Natural Resources Element of the Comprehensive Plan is repealed and a new Water Resources section of the Natural Resources Element of the Oregon City Comprehensive Plan is hereby enacted to read as follows:

"Discussion

As discussed in the Metro Growth Management Services Department, "Policy and Scientific Literature Review for Title 3 of the Urban Growth Management Functional Plan: Water Quality and Floodplain Management Conservation" (July 1997), the Department of Environmental Quality (DEQ) has identified 34 stream/river segments (over 213 miles) and lakes in the Metro region that do not meet water quality standards. In the early 1990's, most jurisdictions had taken some steps to protect water resources (e.g. requiring a buffer along streams and wetlands). However, development prior to that time was not subject to current requirements. As a result, many stream and wetland corridors are degraded or developed completely. It is important to protect the remaining vegetated corridors and re-vegetate wherever practicable.

The management of water quality involves several factors, which include the following:

1. Maintenance or reduction of water temperature;
2. Stream/Channel stability;
3. Sediment reduction;
4. Excess nutrient and metal removal; and
5. Moderation of stormwater runoff

Vegetated corridors provide many functions to promote water quality. They help stabilize temperatures in streams and wetlands, while providing channel stability, which enables streams to retain their structure and function. Vegetated corridors filter the flow of sediment and debris, stabilize streambanks and wetland edges and promote infiltration. They can remove metals and excess nutrients from runoff and overland flow by filtering water, via plant uptake, and microbial activity. Finally, vegetated corridors can moderate seasonal water level fluctuations in streams and wetlands as they slow the flow of runoff and allow it to percolate into the ground.

Existing State and Federal Programs

The goal of the 1977 Federal Clean Water Act (CWA) is to maintain and restore the physical, chemical and biological integrity of waters in the United States. The CWA prohibits discharges of pollutants into waters of the United States, unless the discharge is in compliance with a National Discharge Elimination System (NPDES) permit. In Oregon, the CWA is implemented by Department of Environmental Quality (DEQ) with review and approval by the United States Environmental Protection Agency (EPA).

The Department of Environmental Quality (DEQ) has established standards that apply to Total Maximum Daily Loads (TMDLs) for pollutants. It has applied the standards to the Tualatin River and is developing TMDLs and a management strategy for the Columbia Slough (DEQ, 1994). TMDLs for dioxin have been set for the Willamette and Columbia Rivers. Management plans have not been developed for any of the other listed waterbodies in the state.

Section 404 of the Federal Clean Water Act authorizes the Army Corps of Engineers to regulate dredging and filling into the "waters of the United States." The term "waters of the United States" has been defined broadly to include virtually all surface waters, regardless of their size. In Oregon, the state Removal/Fill Law gives the Division of State Lands (DSL) similar authority. To fill or dredge a wetland area in Oregon, permits are required from both the Army Corps of Engineers (Corps) and DSL.

Statewide Planning Goal 6 is "to maintain and improve the quality of the air, water and land resources of the state." Establishing water quality protection is consistent with this goal as it sets standards for water quality protection, specifically requiring erosion and sediment control, vegetative retention, and prohibiting new uses of uncontained hazardous materials.

Statewide Planning Goal 7 is "to protect life and property from natural disasters and hazards." Implementing water quality controls is consistent with Goal 7 as it sets standards to protect against flooding and prevent or reduce risk to human life and properties.

Statewide Planning Goal 5 is "to protect natural resources, and conserve scenic historic areas and open space." The City of Oregon City's adoption of its Local Wetlands Inventory (October 1998) addresses Goal 5.

Existing Regional Requirements

The City is required to comply with Title 3 of the Growth Management Functional Plan. This title includes standards that promote more effective land use practices to protect water quality by establishing standards for protecting vegetated corridors. Additionally, Title 3's performance standards may also be used to meet DEQs TMDL requirements. By complying with Title 3, TMDLs may not have to be developed. Where TMDLs have been established or will be required, a watershed planning process may be initiated (DEQ, 1997).

Inventory of Wetlands and Water Resources

In 1989, Oregon State Legislature authorized the Department of State Lands (DSL) to develop a statewide wetlands inventory suitable for planning and regulatory purposes. Pursuant to ORS 196.674, in 1994 the DSL established Local Wetland Inventory (LWI) standards and guidelines. The purpose of an LWI is to locate, map, and classify wetlands by type (such as forested wetlands) over a relatively large geographic area. In accordance with LWI standards, the approximate boundaries of all wetlands at least 0.5 acre in size are identified on an inventory. The City of Oregon City recently (October 1998) had a Local Wetland Inventory and Riparian Assessment prepared. The LWI includes wetland delineations approved by the DSL and Corps of Engineers, which were confirmed within the last ten years.

Goal

Enhance the quality of life by protecting water resources and working to maintain and improve water quality.

Policies

1. The City shall protect and improve the beneficial water uses and functions and values of Water Quality Resource Areas through the protection of vegetated corridors along protected water features.

2. The City shall adopt the City of Oregon City Local Wetland Inventory (LWI) by reference into the Comprehensive Plan. The LWI shall provide a resource and a reference about the location of wetlands in Oregon City.

3. The City shall establish a Water Quality Resource Area Overlay District based on the Metro Water Quality and Flood Management Area maps.

4. The City shall adopt standards in Chapter 17 of the Municipal Code designed to protect Water Quality Resource Areas. The purpose of these standards is to:

a. provide a vegetated corridor to separate Protected Water Features from development;
b. maintain or reduce stream temperatures;
c. maintain natural stream corridors;
d. minimize erosion and nutrient and pollutant loading into water; and
e. filter, provide infiltration and natural water purification.

5. The City shall conserve domestic groundwater and surface water resources from potential pollution through a variety of regulatory measures relating to land use, transportation, and hazardous substances.
6. The City shall conserve wetlands, riparian areas and water bodies which have functions and values related to flood protection, sediment and erosion control, water quality, groundwater recharge and discharge, education, vegetation and fish and wildlife habitat. Regulate development within water bodies, riparian areas, and wetlands to retain their important functions and values.

Section 2. That the Flood Plain section of the Natural Hazards Element of the Oregon City Comprehensive Plan is hereby repealed and a new Flood Management section of the Natural Hazards Element of the Oregon City Comprehensive Plan is hereby enacted to read as follows:

"Discussion

Flooding is a problem in the Portland metropolitan region and is expected to become worse as the region grows. Cost estimates of the February 1996 flood and landslide disaster in the entire tri-county region (which includes Clackamas, Multnomah and Washington counties) were almost $60 million dollars (Oregon Emergency Management Office, 1997) (Reference: Metro, Growth Management Services Department, "Policy and Scientific Literature Review for Title 3 of the Urban Growth Management Functional Plan: Water Quality and Floodplain Management Conservation", July 1997). Within the City of Oregon City there are areas which are subject to the periodic presence of surface water as a result of flooding. These flood management areas are associated with several rivers and streams, including the Willamette River, the Clackamas River, and Abernethy Creek. In terms of managing these areas there are two important issues: the degree of hazard to life and property and the preservation of natural function and value of the stream corridors as drainageways. A precise map of flood plain boundaries as approved by the US Department of Housing and Urban Development (HUD), is on file in City Hall.

Costs associated with flooding have grown exponentially in recent years, not necessarily because floods are any larger or more frequent. Rather it is because of human development in the floodplain where rivers will eventually return. Flooding is a natural process that helps restore a river's health, clean its sediments, create critical aquatic and streamside habitat, exchange nutrients between the river and its floodplain and renew its fisheries. Floods clean out accumulations of large wood. Floods also bring leaves, needles, wood and dissolved nutrients into the river giving aquatic communities access to new habitats and increased food supplies (Orsinger and Gregory, 1996) (Reference: Metro, Growth Management Services Department, "Policy and Scientific Literature Review for Title 3 of the Urban Growth Management Functional Plan: Water Quality and Floodplain Management Conservation", July 1997).

Floodplains in their natural or relatively undisturbed state provide numerous beneficial natural resource functions and values, including:

a. Moderation of floods, flood storage, water quality maintenance and groundwater recharge,
b. Habitat value for plants and animals, and
c. Scientific, historic, agricultural, recreational and aesthetic values (FEMA, 1992). (Reference: Ibid.)

Existing State and Federal Programs

Statewide Planning Goal 7 is "to protect life and property from natural disasters and hazards." The guidelines state that "Development subject to damage or that could result in loss of life shall not be planned nor located in known areas of natural disasters and hazards without appropriate safeguards." Stream flooding is listed among the natural events subject to this Goal. The guidelines go on to state that "In planning for floodplain areas, uses that will not require protection through dams, dikes and levies should be preferred over uses that will require such protection." Implementation for the Goal includes the recommendation that cities and counties not already eligible should qualify for inclusion in the National Flood Insurance Program.

With passage of the Flood Control Act of 1936, the federal government has dominated the nation's flood damage reduction efforts. The primary federal tool to address flood hazard management is the National Flood Insurance Program (NFIP). The U.S. Congress initiated the NFIP in 1968 to provide low cost insurance to communities that have adopted approved floodplain management regulations. The program is administered by the Federal Insurance Agency (FIA) which is part of the Federal Emergency Management Agency (FEMA). NFIP requires communities to adopt a local floodplain management ordinance approved by FEMA. The ordinance is based on the Flood Insurance Rate Map (FIRM). Flood risk is determined and insurance rates are set for mapped floodplain areas. In designating flood plain areas, FEMA has conducted studies that delineate land areas needed to hold anticipated water volumes resulting from 100-year flood conditions.

Existing Regional Requirements

The City is required to comply with Title 3 of the Growth Management Functional Plan. This title includes standards for floodplains that require balanced cut and fill and the expansion of flood management areas to include the boundary of historic floods and not just the Federal Emergency Management Agency 100-year floodplain.

Goal

To assure that urban land use activities are planned, located and conducted consistently with the best available information and technology, so that the risk of flood damage is minimized.

Policies

1. The City shall adopt standards in the Chapter 17 of the Municipal Code designed to protect Flood Management Areas, which provide the following functions:
   a. Protect life and property from dangers associated with flooding;
   b. Flood storage, reduction of flood velocities, reduction of flood peak;
   c. Flows and reduction of wind and wave impacts;
   d. Maintain water quality by reducing and sorting sediment loads;
   e. Processing chemical and organic wastes and reducing nutrients;
   f. Recharge, store and discharge groundwater; and
   g. Provide plant and animal habitat, and support riparian ecosystems.

2. The City shall maintain and, when necessary, update the flood management standards of the Municipal Code, consistent with federal, state and regional regulations, and the Uniform Building Code (UBC).

3. The City shall retain qualification in the National Flood Insurance Program through implementation of a full range of floodplain management measures."

Section 3. That the Landslides, Weak Foundation Soils and Erosion section of the Natural Hazards element of the Oregon City Comprehensive Plan is hereby repealed and a new Landslides, Weak Foundation Soils and Erosion section of the Natural Hazards element of the Oregon City Comprehensive Plan is enacted to read as follows:

"Discussion

Landslide-prone areas should be evaluated on a site specific basis and should be protected from excavations and/or major vegetation clearing activity that would result in increased slide activity. No mudslide hazard areas have been identified in the Federal Study accompanying flood plain identification.

Construction of buildings and roadways in areas evidencing weak foundation soils should require special development standards in order to eliminate future damages. This should be applied on a site specific basis. Such areas do exist in Oregon City and detailed maps are on file at the Oregon City Planning Department.

During new roadway and structure construction, excavation in landslide-prone areas and weak foundation soils should be avoided to the extent practicable, but excavation of fill and unstable soils is required by building code.

Maintenance of existing vegetation or revegetation should be required for excavation and road slopes for those areas designated as landslide-prone.

These soil hazards can be identified in the report "Soil Survey Interpretations for Oregon City Areas" by the Soil Conservation Service, and in the Clackamas County and State of Oregon inventory maps on file at the Oregon City Planning Department. The City should investigate commissioning a geological survey of the City in the near future and also investigate sources for funding the service.

Erosion is the movement of soil particles caused by man-made or natural disturbances. Erosion produces sediment that moves in suspension from its site of origin by air, water or gravity. Erosion not only causes loss of productive soil, but also damages infrastructure and degrades water quality and aquatic life. When water enters larger slower-moving bodies of water, such as lakes, reservoirs and large rivers, it slows allowing sediment to settle out. Excessive sediment accumulation decreases reservoir storage capacity and increases risks of flooding. Dredging costs are incurred to remove sediment from reservoirs and streams.

Runoff from construction sites is by far the largest source of sediment in developing urban areas. Erosion rates from natural areas, such as undisturbed forested lands, are typically less than one ton/acre/year, while erosion from construction sites ranges from 7.2 to 200 tons/acre/year (EPA, 1993) (Reference: Metro, Growth Management Services Department, "Policy and Scientific Literature Review for Title 3 of the Urban Growth Management Functional Plan: Water Quality and Floodplain Management Conservation", July 1997.)

Existing State and Federal Programs

Federal regulations for erosion control are part of the Clean Water Act. The United States Environmental Protection Agency (USEPA) published final regulations that establish application requirements for National Pollution Discharge Elimination System (NPDES) permits for specific categories of industries and construction activities of five acres or more. The Department of Environmental Quality (DEQ) has written state permitting requirements for industrial and construction activities consistent with the federal rules. In urban areas, DEQ designates a qualified local surface water agency to assume permit insurance responsibility (Reference: Ibid.).

The City of Oregon City, as a co-permittee with Clackamas County, holds a Municipal Separated Sanitary and Storm Sewer (MS-4) NPDES permit for stormwater discharge. The City is required to comply with this permit, specifically the obligation to improve regulations by ordinance for controlling pollution in stormwater runoff.

Current federal and state regulations fall short of adequately protecting water resources from erosion and sediment produced by construction activities. Their major shortcoming is that they only apply to sites larger than five acres. Construction activities that occur on less than five acres are not required to address erosion. Significant erosion problems have been reported from sites smaller than five acres (Woodward-Clyde, 1996). (Reference: Ibid.)

Statewide Planning Goal 6 is "to maintain and improve the quality of air, water and land resources of the state." This goal's guidelines recommend that local governments amend their comprehensive plans to buffer and separate land uses which create or lead to conflicting requirements and impacts on the air, water and land resources. Implementation of the goal involves the adoption of policies that protect water quality, specifically requiring erosion and sediment control.

Existing Regional Requirements

The City is required to comply with Title 3 of the Growth Management Functional Plan. The comprehensive, region-wide erosion and sediment control requirements of Title 3 significantly reduce sediment loading to receiving streams.

Goal

Protect the natural and built environment from the negative impacts of unstable soils, erosion and sediment.

Policies

1. The City shall implement erosion prevention measures and sediment control practices for all development during construction to prevent and restrict the discharge of sediments, and require final permanent erosion prevention measures after development is completed.

2. The City shall adopt standards in the Chapter 17 of the Municipal Code designed to:

    a. Prevent erosion by employing prevention practices such as nondisturbance, construction schedules, erosion blankets and mulch covers; or
    b. Ensure that where erosion cannot be completely avoided, the sediment control measures will be adequate to prevent erosion from entering the public stormwater system, surface water system and Water Qualify Resource Areas; and
    c. Allow no more than a ten- percent cumulative increase in natural stream turbidities, as measured relative to a control point immediately upstream of a turbidity-causing activity. However, limited duration of activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities, and that cause the standard to be exceeded, may be authorized, provided all practical turbidity control techniques have been applied."

3. The City shall adopt standards in Chapter 17 of the Municipal Code designed to:

a. Provide safeguards in connection with development on or adjacent to steep hillsides and landslide areas and other identified known or potential hazard areas, in order to reduce potential hazards to public health, welfare and safety. Such hazards include landslides, mud flows, high ground water tables, soil slump and erosion, which, in turn, may cause siltation or other degradation of quality of waters of the state and damage to public and private property and public facilities.

b. Reduce the direct and indirect costs of these effects, in economic and non-economic terms.

Section 4. That Title 16: LAND DIVISIONS, Chapter 16.08: SUBDIVISIONS – PROCESS AND STANDARDS, Section 16.08.040: PRELIMINARY SUBDIVISION PLAT – REQUIRED PLANS, Subsection (C) and Subsection (D), are hereby amended to read as follows:

16.08.040 Preliminary Subdivision Plat – Required Plans

C. Natural Features Plan and Topography, Preliminary Grading and Drainage Plan. The applicant shall submit a map illustrating all of the natural features and hazards on the subject property and, where practicable, within two hundred and fifty feet of the property's boundary. The map shall also illustrate the approximate grade of the site before and after development. Illustrated features must include all proposed streets and cul-de-sacs, the location and estimated volume of all cuts and fills, and all stormwater management features. This plan shall identify the location of drainage patterns and courses on the site and within two hundred and fifty feet of the property boundaries where practicable. Features that must be illustrated shall include the following:

1. Proposed and existing street rights-of-way and all other transportation facilities;
2. All proposed lots and tracts;
3. All trees with a diameter six inches or greater measured four feet from the ground;
4. All Water Quality Resource Areas pursuant to Chapter 17.49, including all jurisdictional wetlands shown in a delineation according to the Corps of Engineers Wetlands Delineation Manual, January, 1987 edition, and approved by the Division of State Lands and wetlands identified in the City of Oregon Local Wetlands Inventory, adopted by reference in the City of Oregon City comprehensive plan;
5. All known geologic and flood hazards, landslides or faults, areas with a water table within one foot of the surface and all Flood Management Areas pursuant to Chapter 17.42;
6. The location of any known state or federal threatened or endangered species;
7. All historic areas or cultural features acknowledged as such on any federal, state or city inventory;
8. All wildlife habitat or other natural features listed on any of the city's official inventories.

The planning manager may waive any of the foregoing requirements if the planning manager determines that the requirement is unnecessary in the particular case.

D. Erosion and Sediment Control Permit. The applicant shall submit an application for an erosion and sediment control permit pursuant to Chapter 17.47 concurrently with the preliminary subdivision plat application, including an erosion control plan illustrating the measures that will be implemented throughout construction of the subdivision to control erosion and sedimentation, unless waived by the city engineer. This plan must be consistent with all applicable erosion control requirements in Chapter 17.47. Upon consultation with appropriate experts, the city engineer may waive any of the foregoing requirements if the city engineer determines that the requirement is unnecessary in the particular case.

Section 5. That Title 16: LAND DIVISIONS, Chapter 16.08: SUBDIVISIONS – PROCESS AND STANDARDS, Section 16.08.050: PRELIMINARY SUBDIVISION PLAT – NARRATIVE STATEMENT, Subsection (E), is hereby amended to read as follows:

16.08.050 Preliminary Subdivision Plat – Narrative Statement

E. Water Resources. For property subject to Chapter 17.49, the applicant shall submit a report prepared by a qualified professional describing the location and quality of any water quality resource area subject to regulation under Chapter 17.49. This report shall also explain how the proposed subdivision is feasible and meets the applicable requirements of Chapter 17.49. The city engineer may waive any of the foregoing requirements if the city engineer determines that the requirement is unnecessary in the particular case.

Section 6. That Title 16: LAND DIVISIONS, Chapter 16.12: MINIMUM IMPROVEMENTS AND DESIGN STANDARDS FOR LAND DIVISIONS, Section 16.12.330: WATER RESOURCES, is hereby amended to read as follows:

16.12.330 Water Quality Resource Areas

Any land division which contains a Water Quality Resource Area shall comply with the requirements of the Water Quality Resource Area Overlay District, Chapter 17.49, including the requirement, pursuant to 17.49.060, that new subdivisions and partitions delineate and show the Water Quality Resource Area as either a separate tract or part of a larger tract that will not be developed.

Section 7. That Title 16: LAND DIVISIONS, Chapter 16.16: PARTITIONS - - PROCESS AND STANDARDS, SECTION 16.16.030: PARTITION APPLICATION SUBMISSION REQUIREMENTS, Subsection (L) and Subsection (N) are hereby amended to read as follows:

16.16.030 Partition application submission requirements.

L. All areas designated as being within the Flood Management Overlay District regulated under Chapter 17.42.

N. All Water Quality Resource Areas designated and regulated under the Water Quality Resource Area Overlay District in Chapter 17.49.

Section 8. That Title 17: ZONING, Chapter 17.42:F-P FLOODPLAIN OVERLAY DISTRICT is hereby repealed and a new Title 17: ZONING, Chapter 17.42: FLOOD MANAGEMENT OVERLAY DISTRICT is hereby enacted to read as follows:

CHAPTER 17.42

FLOOD MANAGEMENT OVERLAY DISTRICT

Sections:

17.42.010 Purpose--Findings.
17.42.020 Definitions.
17.42.030 Applicability.
17.42.040 Basis for establishing areas of special flood hazard.
17.42.050 Compliance.
17.42.060 Abrogation and greater restrictions
17.42.070 Warning and disclaimer of liability
17.42.080 Severability.
17.42.090 Administration.
17.42.100 Building official--duties and responsibilities.

17.42.110 Use of other base flood data.
17.42.120 Information to be obtained and maintained.
17.42.130 Alteration of watercourses.
17.42.140 Map administration.
17.42.150 Appeals and variance procedure.
17.42.160 Conditions for variances.
17.42.170 Flood management area standards.
17.42.180 Review of building permits.
17.42.190 Subdivision standards.
17.42.200 Floodways.

17.42.010 Purpose--Findings. There is established in the City a Flood Management Overlay District. The Flood Management Overlay District is an overlay zone classification and all conditions and restrictions of land use established by this chapter of the City's zoning ordinance shall be in addition to such restrictions and conditions as may be imposed and established in underlying zoning districts.

It is the purpose of this chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

A. To protect human life and health;
B. To minimize expenditure of public money and costly flood control;
C. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
D. To minimize prolonged business interruptions;
E. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
F. To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
G. To ensure that potential buyers are notified that property is in an area of special flood hazard; and
H. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.
I. To protect Flood Management Areas, which provide the following functions:
    1. Protect life and property from dangers associated with flooding;
    2. Flood storage, reduction of flood velocities, reduction of flood peak;
    3. Flows and reduction of wind and wave impacts;
    4. Maintain water quality by reducing and sorting sediment loads;
    5. Processing chemical and organic wastes and reducing nutrients, recharge, store and discharge groundwater; and
    6. Provide plant and animal habitat, and support riparian ecosystems.

17.42.020 Definitions. Unless specifically defined below, words and phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application.

"Architect" means an architect licensed by the State of Oregon.

"Area of Special Flood Hazard" means the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. Designation on FEMA maps always includes the letters A or V.

"Bankfull Stage" means the stage or elevation at which water overflows the natural banks of streams or other waters of this state. The bankfull stage may be approximated by using either the two-year recurrence interval flood elevation or one foot measured vertically above the Ordinary Mean High Water Line.

"Base Flood" means the flood having a one percent chance of being equaled or exceeded in any given year. Also referred to as the one-hundred-year flood. Designation on maps always includes the letters A or V.

"Basement" means any area of the building having its floor subgrade (below ground level) on all sides.

"Design Flood Elevation" means the elevation of the base flood or 100-year storm as defined in FEMA (Federal Emergency Management Agency) Flood Insurance Studies, or the highest flood of record since the adoption of the Flood Insurance Maps, or, in areas without FEMA floodplains, the elevation of the 25-year storm, or the edge of mapped flood-prone soils or similar methodologies whichever is higher.

"Development" means any man-made change to improved or unimproved real estate, including but not limited to buildings, or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.

"Emergency" means any man-made or natural event or circumstance causing or threatening loss of life, injury to person or property, and includes, but is not limited to, fire, explosion, flood, severe weather, drought, earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

"Engineer" means a registered professional engineer licensed by the State of Oregon.

"Engineering Geologist" means a registered professional engineering geologist licensed by the State of Oregon.

"Enhancement" means the process of improving upon the natural functions and/or values of an area or feature which has been degraded by human activity. Enhancement activities may or may not return the site to a pre-disturbance condition, but create/recreate processes and features that occur naturally.

"Existing manufactured home park or subdivision" means a manufactured home park subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the puring of concrete pads) is completed before the effective date of this chapter.

"Expansion to an existing manufactured home park or subdivision" means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the puring of concrete pads).

"Fill" means any material such as, but not limited to, sand, gravel, soil, rock or gravel that is placed for the purposes of development or redevelopment.

"Flood" or "Flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of inland or tidal waters; and/or
2. The unusual and rapid accumulation of runoff of surface waters from any source.

"Flood Insurance Rate Map" means the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazard and the risk premium zones applicable to the community.

"Flood Insurance Study" means the official report provided by the Federal Insurance Administration that includes flood profiles, the flood boundary-floodway map, and the water surface elevation of the base flood.

"Flood Management Areas" means all lands contained within the 100-year floodplain, flood area and floodway as shown on the Federal Emergency Management Agency Flood Insurance Rate Maps, Floodway Maps and the area of inundation for the February 1996 flood.

"Floodplain" means the land area identified and designated by the United States Army Corps of Engineers, the Oregon Division of State Lands, FEMA, or City of Oregon City that has been or may be covered temporarily by water as a result of a storm event of identified frequency. It is usually the flat area of land adjacent to a stream or river formed by floods.

"Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

"Floodway Fringe" means the area of the floodplain, lying outside the floodway, which does not contribute appreciably to the passage of flood water, but serves as a retention area.

"Lowest Floor" means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable nonelevation design requirements of this title found at Section 17.42.170(E)(4) or (5).

"Manufactured Home" means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."

"Manufactured Home Park or Subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

"Metro" means the regional government of the Portland metropolitan area and the elected Metro Council as the policy setting body of the government.

"Natural Location" means the location of those channels, swales, and other non-manmade conveyance systems as defined by the first documented topographic contours existing for the subject property either from maps or photographs, or such other means as appropriate.

"New Construction" means structure for which the "start of construction" commenced on or after the effective date of this title.

"New manufactured home park or subdivision" means a manufactured home park subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the puring of concrete pads) is completed on or after the effective date of this chapter.

"Ordinary Mean High Water Line" means, as defined in OAR 141-82-005, the line on the bank or shore to which water ordinarily rises in season; synonymous with Mean High Water (ORS 274.005).

"Ordinary Mean Low Water Line" means, as defined in OAR 141-82-005, the line on the bank or shore to which water ordinarily recedes in season; synonymous with Mean Low Water (ORS 274.005).

"Owner or Property Owner" means the person who is the legal record owner of the land, or where there is a recorded land sale contract, the purchaser thereunder.

"Parcel" means a single unit of land that is created by a partitioning of land. (ORS 92.010(7)).

"Practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose.

"Recreational Vehicle" means a vehicle which is:

a. Built on a single chassis;
b. 400 square feet or less when measured at the largest horizontal projection;
c. Designed to be self-propelled or permanently towable by a light duty truck; and
d. Designed primarily as temporary quarters for recreational, camping, travel, or seasonal use and not for use as a permanent dwelling.

"Start of Construction" is meant to include substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, placement or other improvement was within one hundred eighty days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or

footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or shed not occupied as dwelling units or not a part of the main structure.

"Stormwater Pre-treatment Facility" means any structure or drainage way that is designed, constructed, and maintained to collect and filter, retain, or detain surface water run-off during and after a storm event for the purpose of water quality improvement.

"Stream" means a body of running water moving over the earth's surface in a channel or bed, such as a creek, rivulet or river. It flows at least part of the year, including perennial and intermittent streams. Streams are dynamic in nature and their structure is maintained through build-up and loss of sediment.

"Structure" means a walled and roofed building including a gas or liquid storage tank that is principally above ground.

"Substantial Improvement" means any repair, reconstruction or improvement of a structure, the cost of which equals or exceeds fifty percent of the market value of the structure either:

1. Before the improvement or repair is started; or
2. If the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

The term does not, however, include either:

1. Any project for improvement of a structure to correct existing violations of State or local health, sanitary or safety code specifications which has been identified by the local code enforcement official and that is the minimum necessary to assure safe living conditions; or
2. Any alteration of a "historic structure", provided that the alteration will not preclude the structure's continued designation as a "historic structure."

"Utility Facilities" means buildings, structures or any constructed portion of a system which provides for the production, transmission, conveyance, delivery or furnishing of services including, but not limited to, heat, light, water, power, natural gas, sanitary sewer, stormwater, telephone and cable television. Utility facilities do not include stormwater pre-treatment facilities.

"Variance" means a grant of relief from the requirements of this Chapter which permit construction in a manner that would otherwise be prohibited by this title.

"Watercourse" means a channel in which a flow of water occurs, either continuously or intermittently, and if the latter, with some degree of regularity. Such flow must be in a definite direction.

"Watershed" means a geographic unit defined by the flows of rainwater or snowmelt. All land in a watershed drains to a common outlet, such as a stream, lake or wetland.

"Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands are those areas identified and delineated by a qualified wetland specialist as set forth in the 1987 Corps of Engineers Wetland Delineation Manual.

17.42.030 Applicability

A. This chapter shall apply to development in the Flood Management Overlay District, which may also be referred to as the "Floodplain Overlay District" in this Code. The Flood Management Overlay District includes all areas of special flood hazards and all Flood Management Areas within the City. The overlay district restricts the uses that are allowed in the base zone by right, with limitations, or as provisional uses.

B. The Flood Management Areas which have been mapped include the following locations:

1. Land contained within the 100-year floodplain, flood area and floodway as shown on the Federal Emergency Management Agency Flood Insurance maps including areas of special flood hazard pursuant to section 17.42.040 and the area of inundation for the February 1996 flood; and
2. Lands that have physical or documented evidence of flooding within recorded history based on aerial photographs of the 1996 flooding and/or the Water Quality and Flood Management Areas maps.

C. The standards that apply to the Flood Management Areas apply in addition to state or federal restrictions governing floodplains or flood management areas.

17.42.040 Basis for Establishing the Areas of Special Flood Hazard. The areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study for the City of Oregon City", dated January 29, 1979, with accompanying flood insurance maps is adopted by reference and declared to be a part of this chapter. The Flood Insurance Study is on file at the office of the City Recorder in the City Hall.

17.42.050 Compliance. No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of these floodplain regulations and other applicable regulations.

17.42.060 Abrogation and greater restrictions. This chapter is not intended to repeal, abrogate or impair any existing easements, covenants or deed restrictions. However, where this chapter and another section, easement, covenant or deed restriction conflict or overlap, whichever imposes the more stringent restriction shall prevail.

17.42.070 Warning and disclaimer of liability. The degree of flood protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This chapter does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flooding damages. This chapter shall not create liability on the part of the City, any officer or employee thereof, or the Federal Insurance Administration for any flood damages that result from reliance on this chapter or any administrative decision lawfully made thereunder.

17.42.080 Severability. The provisions of this chapter are severable. If any section, clause or phrase of this chapter is adjudged to be invalid by a court of competent jurisdiction, the decision of that court shall not affect the validity of the remaining portions of this ordinance.

17.42.090 Administration.

A. This chapter establishes a Flood Management Overlay District, which is delineated on the Water Quality and Flood Management Areas Map attached and incorporated by reference as a part of this document.
   1. The following maps and studies are adopted and declared to be a part of this Chapter. These maps are on file in the office of the City Recorder.
      a. The Water Quality and Flood Management Areas Map, dated June 7,1999;
      b. The Federal Insurance Administration, Flood Insurance Rate Maps for Oregon City dated February 15, 1980 and for Clackamas County dated August 4, 1987;
      c. The Federal Insurance Administration (FIA) "Flood Insurance Study for Oregon City", dated August, 1979;
      d. Oregon City and Clackamas County Flood Boundary and Floodway Maps, dated February 15, 1980 and August 4, 1987;

2. Applicants are required to provide the City with a delineation of the Flood Management Areas on the subject property as part of any application. An application shall not be complete until this delineation is submitted to the City.

B. The City shall review the Water Quality and Flood Management Areas Maps during periodic review as required by ORS 197.633 (1997).

C. Development Permit: A development permit shall be obtained before construction or development begins within any portion of the Flood Management Overlay District. The permit shall be for all structures including manufactured homes, as set forth in Section 17.42.020 (Definitions) and all other development, including fill and other activities, as set forth in Section 17.42.020 (Definitions).

Application for a development permit shall be made on forms furnished by the Community Development Department. Requirements may include, but are not limited to: plans in duplicate drawn to scale showing the nature, location, dimensions and elevations of the area in question; existing or proposed structures, fill, storage materials, drainage facilities; and the location of the foregoing.

The following information is specifically required:

1. Elevation in relation to mean sea level of the lowest floor (including basement) of all structures;
2. Elevation in relation to mean sea level to which any structure has been flood proofed;
3. Certification by a registered professional engineer or architect that the flood proofing methods for any non-residential structure meet the flood proofing criteria in Section 17.42.170(E)(5); and
4. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

17.42.100 Building Official--duties and responsibilities.

A. The Building Official is appointed to administer and implement this title by granting or denying development permit applications in accordance with its provisions.

B. Duties of the Bulding Official shall include, but not be limited to those listed in this chapter.

C. The Building Official shall:

1. Review all development permits to determine that the permit requirements of this title have been satisfied;
2. Review all development permits to determine that all necessary permits have been obtained from those Federal, State or Local governmental agencies from which prior approval is required; and
3. Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the provisions of Section 17.42.200 are met.

17.42.110 Use of Other Base Flood Data. When base flood elevation data has not been provided in accordance with Section 17.42.040, the Building Official shall obtain, review and reasonably utilize any base flood elevation and floodway date available from a Federal, State or other source, in order to administer Sections 17.42.170 and 17.42.200.

17.42.120 Information to be obtained and maintained.

The Building Official shall:

A. Where base flood elevation data is provided through the flood insurance study or required as in Section 17.42.110, obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structure, and whether or not the structure contains a basement.

B. For all new or substantially improved flood proofed structures:

1. Verify and record the actual elevation (in relation to mean sea level); and
2. Maintain the flood proofing certifications required in Section 17.42.090(C)(3);
3. Maintain for public inspection all records pertinent to the provisions of this chapter.

17.42.130 Alteration of watercourses.

A. Notify adjacent communities and the Department of Land Conservation and Development prior to any alteration or relocation of a water course, and submit evidence of such notification to the Federal Insurance Administration.

B. Require that maintenance is provided within the altered or relocated portion of the watercourse so that the flood-carrying capacity is not diminished.

17.42.140 Map Administration.

A. The purpose of this section is to provide a process for interpreting and amending the Water Quality and Flood Management Areas Map to clarify and correct the location of Flood Management Overlay District.

B. Interpretation of Map Boundaries:

The Building Official shall make interpretations, where needed, as to exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in Section 17.42.150.

C. Map Corrections shall be processed pursuant to the requirements of Chapter 17.68.

1. Within 90 days of receiving information establishing a possible error in the existence or location of the Flood Management Overlay District, the City shall provide notice to interested parties of a public hearing at which the City will review the information.
2. The City shall amend the Water Quality and Flood Management Areas Map if the information demonstrates that the boundaries of the Flood Management Overlay District have changed since adoption of the Water Quality and Flood Management Areas Map by Metro (June 18, 1998) provided that, in the case of a boundary established by FEMA, a Letter of Map Amendment (LOMA) or Letter of Map Revision is obtained from FEMA prior to any map change.

17.42.150 Appeals and variance procedure.

A. The purpose of this Section is to ensure that compliance with this chapter does not cause unreasonable hardship. To avoid such instances, the requirements of this chapter may be varied. Variances are also allowed when strict application of this chapter would deprive an owner of all economically viable use of land.

B. This Section applies to requests to vary from the standards of Chapter 17.42 only. Requests to vary from other standards of Title 17 shall be subject to the requirements of Chapter 17.60.

1. Variance applications made pursuant to this section shall follow the variance procedures outlined in 17.50.

2. In addition to the public notice requirements outlined in 17.50.090, Metro shall be notified within 14 days of the City receiving an application to vary the requirements of this section and within 14 days of a decision on the variance.
3. The requirements of Section 17.60.020 (Variances--Grounds) do not apply to requests to vary from the standards of Chapter 17.42.
4. If an application to vary from the standards of Chapter 17.42 is made in conjunction with an application to vary from other standards of Title 17, the variances may be processed as one application, provided the standards applicable to each variance requested must be met before the requested variance may be granted.

C. Hardship Variance

Variances to avoid unreasonable hardship caused by the strict application of this chapter are permitted subject to the criteria set forth in this section. To vary from the requirements of this ordinance, the applicant must demonstrate the following:

1. The variance is the minimum necessary to allow the proposed use or activity;
2. The variance will not increase danger to life and property due to flooding or erosion;
3. The impact of the increase in flood hazard which will result from the variance will not prevent the City from meeting the requirements of this chapter. In support of this criteria the applicant shall have a qualified professional engineer document the expected height, velocity and duration of flood waters, and estimate the rate of increase in sediment transport of the flood waters expected both downstream and upstream as a result of the variance;
4. The variance will not increase the cost of providing and maintaining public services during and after flood conditions so as to unduly burden public agencies and taxpayers; and
5. The proposed use complies with the standards of the base zone.

D. The Planning Commission shall hear and decide appeals and requests for variances when it is alleged there is an error in any requirement, decision or determination made by the Building Official in the enforcement or administration of these regulations, or that enforcement of this district would result in exceptional hardship.

In passing upon such applications, the Planning Commission shall consider all technical evaluations, all relevant factors, standards specified in other sections of this Title, and:

1. The danger that materials may be swept onto other lands to the injury of others;
2. The danger to life and property due to flooding or erosion damage;
3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
4. The importance of the services provided by the facility to the community;
5. The necessity to the facility of a waterfront location, where applicable;
6. The availability of alternative locations for the proposed use, which are not subject to flooding or erosion damage;
7. The compatibility of the proposed use with existing and anticipated development;
8. The relationship of the proposed use to the Comprehensive Plan;
9. The safety of access to the property in times of flood for ordinary and emergency vehicles;
10. The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site; and
11. The cost of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water systems, and streets and bridges.

E. Upon consideration of the factors listed in Section 17.42.150(D) and the purposes of this district, the Planning Commission may attach such conditions to the granting of variances as it deems necessary to meet the purposes of this district.

F. The City Recorder shall maintain the records of all appeal actions and the Building Official shall report any granted variances to the Federal Insurance Administration upon request.

17.42.160 Conditions for Variances. The Planning Commission may impose such conditions as are deemed necessary to limit any adverse impacts that may result from granting relief. If a variance is granted pursuant to section 17.42.150, the variance shall be subject to the following conditions:

In addition to other standards listed in Section 17.42.170, the following conditions must be met:

A. Variances may be issued for the reconstruction or restoration of structures listed on the National Register of Historic Places, pursuant to Chapter 17.60 and without regard to the procedures set forth in the remainder of this Chapter.

B. Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.

C. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

D. Any applicant to whom a variance is granted shall be given notice that the structure will be permitted to be built with the lowest flood elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increase resulting from the reduced lowest floor elevation.

17.42.170 Flood Management Area Standards.

A. Uses Permitted Outright:
   1. Excavation and fill required to plant any new trees or vegetation.
   2. Restoration or enhancement of floodplains, riparian areas, wetland, upland and streams that meet federal and state standards provided that any restoration project which encroaches on the floodway complies with the requirements of this Section 17.42.200 (Floodways).

B. Provisional Uses:

   All uses allowed in the base zone or existing flood hazard overlay zone are allowed in the Flood Management Overlay District subject to compliance with the Development Standards of this section.

C. Prohibited Uses:
   1. Any use prohibited in the base zone.
   2. Uncontained areas of hazardous materials as defined by the Department of Environmental Quality.

D. Site Development Standards
   All development in the floodplain shall conform to the following balanced cut and fill standards:
   1. This subsection does not apply to work necessary to protect, repair, maintain, or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies provided that, after the emergency has passed, adverse impacts are mitigated in accordance with applicable standards.

2. No net fill in any floodplain is allowed. All fill placed in a floodplain shall be balanced with at least an equal amount of soil material removed. For the purposes of calculating net fill, fill shall include any structure below the design flood elevation that has been flood proofed pursuant to Section 17.42.170(E)(5).
3. Any excavation below bankfull stage shall not count toward compensating for fill.
4. Excavation to balance a fill shall be located on the same parcel as the fill unless it is not practicable to do so. In such cases, the excavation shall be located in the same Oregon City floodplain, so long as the proposed excavation and fill will not increase flood impacts for surrounding properties as determined through hydrologic and hydraulic analysis.
5. For excavated areas identified by the City to remain dry in the summer, such as parks or mowed areas, the lowest elevation of the excavated area shall be at least 6 inches above the winter "low water" elevation, and sloped at a minimum of two percent towards the Protected Water Feature pursuant to Chapter 17.49. One percent slopes will be allowed in smaller areas.
6. For excavated areas identified by the City to remain wet in the summer, such as a constructed wetland, the grade shall be designed not to drain into the Protected Water Feature pursuant to Chapter 17.49.
7. Parking areas in the floodplain shall be accompanied by signs that inform the public that the parking area is located in a flood management area and that care should be taken when the potential for flooding exists.
8. Temporary fills permitted during construction shall be removed at the end of construction, 30 days after subdivision acceptance or completion of the final inspection.
9. New culverts, stream crossings and transportation projects shall be designed as balanced cut and fill projects or designed not to significantly raise the design flood elevation. Such projects shall be designed to minimize the area of fill in Flood Management Areas and to minimize erosive velocities. Stream crossings shall be as close to perpendicular to the stream as practicable. Bridges shall be used instead of culverts wherever practicable.
10. Excavation and fill required for the construction of detention facilities or structures, and other facilities, such as levees, specifically shall be designed to reduce or mitigate flood impacts and improve water quality. Levees shall not be used to create vacant buildable lands.

E. Construction Standards
   1. Anchoring-
      a. All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure.
      b. All manufactured homes must likewise be anchored to prevent flotation, collapse or lateral movements and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (reference FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebooks for additional techniques).
   2. Construction Materials and Methods-
      a. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
      b. All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.
      c. Electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

3. Utilities-
   a. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.
   b. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharge from the systems into floodwaters.
   c. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

4. Residential Construction-
   a. New construction and substantial improvements of any residential structure shall have the lowest floor, including basement, elevated to at least one foot above the design flood elevation.
   b. Fully enclosed areas below the lowest floor that are subject to flooding are prohibited unlesss they are designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:
      1. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.
      2. The bottom of all openings shall be no higher than one foot above grade.
      3. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

5. Non-Residential Construction - New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated to at least one foot above base flood elevation; or, together with attendant utility and sanitary facilities, shall:
   a. Be flood proofed so that below the design flood level the structure is watertight with walls substantially impermeable to the passage of water provided that the requirements of Section 17.42.170(D)(2) are met;
   b. Have structured components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;
   c. Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications and plans. Such certifications shall be provided to the official as set forth in Section 17.42.120(B);
   d. Nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in 17.42.170(E)(4)(b); and
   e. Applicants flood proofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g. a building constructed to the design flood level will be rated as one foot below that level).
6. Manufactured Homes - The following standards apply to all manufactured homes to be placed or substantially improved on sites within Zones A1-A-30, AH, and AE on the community's FIRM.

a. On sites which are (1) outside of a manufactured home park or subdivision, (2) in a new manufactured home park or subdivision, (3) in an expansion to an existing manufactured home park or subdivision, or (4) in an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood; the manufactured home shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated one foot above the base flood elevation and be securely anchored to an adequately designed foundation system to resist flotation, collapse and lateral movement.

b. On sites within an existing manufactured home park or subdivision that are not subject to the above manufactured home provisions, the manufactured home shall be elevated so that either:
   (1) The lowest floor of the manufactured home is elevated one foot above the base flood elevation, or
   (2) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately designed foundation system to resist flotation, collapse, and lateral movement.

7. Recreational Vehicles. Recreational vehicles placed on sites within Zones A1-30, AH, and AE as shown on the Flood Insurance Rate Map shall:
   a. Be on site for fewer than 180 consecutive days, and be fully licensed and ready for highway use, on its wheels or jacking system, attached to the site only by quick disconnect type utilities and security devices, and have no permanently attached additions; or
   b. Meet the requirements of 17.42.170(E)(6) above and the elevation and anchoring requirements for manufactured homes.

17.42.180 Review of Building Permits. Where elevation data is not available either through the Flood Insurance Study or from another authoritative source (Section 17.42.110), application for building permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness shall be made by the Building Official, considering use of historical data, high water marks, photographs of past floodings, etc., where available, and the provisions of this Title. Failure to elevate at least two feet above grade in these zones may result in higher insurance rates.

17.42.190 Subdivision Standards.

A. Subdivision Proposals
   1. All subdivision proposals shall be consistent with the need to minimize flood damage.
   2. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.
   3. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage.
   4. Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least fifty lots or five acres (whichever is less).
   5. All structures and site grading developed or conducted in conjunction with a subdivision proposal shall comply with 17.42.170, Flood Management Area Standards.

B. The purpose of this section is to allow density accruing to portions of a property within the Flood Management Overlay District to be transferred outside the overlay district.

1. Development applications shall comply with the submittal requirements of Section 17.64, Planned Unit Development, if the applicant wishes to transfer density.
2. Density transfers shall be allowed if the applicant demonstrates compliance with the following standards:
    a. The density transfer is proposed as part of a Planned Unit Development and meets the requirements of 17.64.050.
    b. Minimum density standards will not increase due to the density transfers.
    c. The area of land contained in a Flood Management Area may be excluded from the calculations for determining compliance with minimum density requirements of the zoning code.

17.42.200 Floodways. Located within areas of special flood hazard established in Section 17.42.040 are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles, and erosion potential, the following provisions apply:

A. Encroachments, including fill, new construction, substantial improvements and other development shall be prohibited unless certification by a registered professional engineer or architect is provided demonstrating that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

B. Construction or reconstruction of residential structures is prohibited within designated floodways, except for (i) repairs, reconstruction, or improvements to a structure which do not increase the ground floor area; and (ii) repairs, reconstruction or improvements to a structure, the cost of which does not exceed 50 percent of the market value of the structure either, (a) before the repair, or reconstruction started, or (b) if the structure has been damaged and is being restored, before the damage occurred. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions or to structures identified as historic places shall not be included in the 50 percent.

B. If Section 17.42.200(A) is satisfied, all new construction and substantial improvements shall comply with all applicable flood management area standards of Sections 17.42.170 through 17.42.200.

Section 9. That Title 17: ZONING, Chapter 17.47: EROSION CONTROL is hereby repealed and a new Title 17: ZONING, Chapter 17.47: EROSION AND SEDIMENT CONTROL is hereby enacted to read as follows:

CHAPTER 17.47

EROSION AND SEDIMENT CONTROL

Sections:

17.47.010 Purpose
17.47.020 Definitions
17.47.030 Applicability
17.47.040 Abrogation and Greater Restrictions
17.47.050 Severability
17.47.060 Permit Required

17.47.070 Erosion and Sediment Control Plans
17.47.080 Plan Implementation
17.47.090 Plan Performance Guarantee and Security
17.47.100 Correction of Ineffective Measures and Enforcement

17.47.010 Purpose. The purpose of this chapter is to require erosion prevention measures and sediment control practices for all development during construction to prevent and restrict the discharge of sediments, and to require final permanent erosion prevention measures, which may include landscaping, after development is completed. Erosion prevention techniques shall be designed to protect soil particles from the force of water and wind and other mechanical means so that they will not be transported from the site. Sediment control measures shall be designed to capture soil particles after they have become dislodged by erosion and attempt to retain the soil particles on site.

The objective of these measures is to control, at the source, water and air borne erosion and the air and water pollution that results from such erosion mechanisms. This chapter recognizes that all non-point discharges eventually end up in surface water bodies. This chapter is intended to control water quality degradation from construction and development activities and it applies in addition to any other applicable provision of this code, state or federal law. This chapter is not intended to serve as a guideline for storm water management control measures for already constructed developments.

17.47.020 Definitions. Unless specifically defined below, words and phases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application.

"Development" means any manmade change to improved or unimproved real estate, including but not limited to the construction of buildings or other structures, sewers, streets or other structures or facilities, mining, dredgeing, paving, filling, or grading in amounts greater than ten (10) cubic yards on any lot or excavation. In addition, any other activity that results in the removal of more than 10 percent of the existing vegetation in the Water Quality Resource Area on a lot is defined as development. Development does not include the following: a) Stream enhancement or restoration projects approved by the City; b) Farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of this Chapter; and (c) construction on lots in subdivisions meeting the criteria of ORS 92.040(2)(1995).

"Development site" means any lot or lots on any part of which development is taking place.

"Disturb" means man-made changes to the existing physical status of the land that are made in connection with development. The following uses are excluded from the definition:

1. Enhancement or restoration of the Water Quality Resource Area;
2. Planting native cover identified in the Oregon City Native Plant List.

"Emergency" means any man-made or natural event or circumstance causing or threatening loss of life, injury to person or property, and includes, but is not limited to, fire, explosion, flood, severe weather, drought, earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

"Erosion" means the movement of soil particles resulting from actions of water, wind or mechanical means.

"Excavation" means any act of development by which soil or rock is cut into, dug, quarried, uncovered, removed, displaced, exposed or relocated.

"Fill" means any material such as, but not limited to, sand, gravel, soil, rock or gravel that is placed for the purposes of development or redevelopment.

"Manager" means the City Manager or the City manager's designated representative.

"Metro" means the regional government of the Portland metropolitan area and the elected Metro Council as the policy setting body of the government.

"Owner" means any party, including an owner, part owner or agent that has a legal interest in a piece of real property upon which development is proposed.

"Sediment" means any soil, sand, dirt, dust, mud, rock, gravel, refuse or any other organic or inorganic material that is in suspension, is transported, has been moved or is likely to be moved by erosion.

"Utility Facilities" means buildings, structures or any constructed portion of a system which provides for the production, transmission, conveyance, delivery or furnishing of services including, but not limited to, heat, light, water, power, natural gas, sanitary sewer, stormwater, telephone and cable television. Utility facilities do not include stormwater pre-treatment facilities.

"Visible or Measurable Erosion" includes, but is not limited to:

a. Deposits of mud, dirt sediment or similar material exceeding one-half cubic foot in volume on public or private streets, adjacent property, or onto the storm and surface water system, either by direct deposit, dropping discharge, or as a result of the action of erosion.
b. Evidence of concentrated flows of water over bare soils; turbid or sediment laden flows; or evidence of on-site erosion such as rivulets on bare soil slopes, where the flow of water is not filtered or captured on the site.
c. Earth slides, mudflows, earth sloughing, or other earth movement that leaves the property.

17.47.030 Applicability.

A. This chapter, which may also be referred to as "Erosion Control" in this Code, applies to development that may cause visible or measurable erosion on any property within the city limits of Oregon City.

B. This chapter does not apply to work necessary to protect, repair, maintain, or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies, provided that after the emergency has passed, adverse impacts are mitigated in accordance with applicable standards.

17.47.040 Abrogation and Greater Restrictions. Where the provisions of this chapter are less restrictive or conflict with comparable provisions of the zoning ordinance, regional, state or federal law, the provisions that are more restrictive shall govern. Where this document imposes restrictions that are more stringent than regional, state and federal law, the provisions of this document shall govern. However, nothing in this chapter shall relieve any party from the obligation to comply with any applicable federal, state or local regulations or permit requirements.

17.47.050 Severability. The provisions of this chapter are severable. If any section, clause or phrase of this chapter is adjudged to be invalid by a court of competent jurisdiction, the decision of that court shall not affect the validity of the remaining portions of this ordinance.

17.47.060 Permit Required. The applicant must obtain an Erosion and Sediment Control Permit prior to, or contemporaneous with, the approval of an application for any building, land use or other city issued permit that may cause visible or measurable erosion.

17.47.070 Erosion and Sediment Control Plans.

A. An application for an Erosion and Sediment Control Permit shall include an Erosion and Sediment Control Plan, which contains methods and interim measures to be used during and following construction to prevent or control erosion prepared in compliance with City of Oregon City Public Works Standards for Erosion and Sediment Control. These standards are incorporated herein and made a part of this Title and are on file in the office of the City Recorder.

B. Approval Standards. An Erosion and Sediment Control Plan shall be approved only upon making the following findings:

1. The Erosion and Sediment Control Plan meets the requirements of the City of Oregon City Public Works Standards for Erosion and Sediment Control incorporated by reference as part of this ordinance;
2. The Erosion and Sediment Control Plan indicates that erosion and sediment control measures will be managed and maintained during and following development. The Erosion and Sediment Control Plan indicates that erosion and sediment control measures will remain in place until disturbed soil areas are permanently stabilized by landscaping, grass, approved mulch or other permanent soil stabilizing measures.

C. The Erosion and Sediment Control Plan shall be reviewed in conjunction with the requested development approval. If the development does not require additional review, the Manager may approve or deny the permit with notice of the decision to the applicant.

D. The City may inspect the development site to determine compliance with the Erosion and Sediment Control Plan and Permit.

E. Erosion that occurs on a development site that does not have an Erosion and Sediment Control Permit, or that results from a failure to comply with the terms of such a Permit, constitutes a violation of this ordinance.

F. If the Manager finds that the facilities and techniques approved in an Erosion and Sediment Control Plan and Permit are not sufficient to prevent erosion, the Manager shall notify the owner or his/her designated representative. Upon receiving notice, the owner or his/her designated representative shall immediately install interim Erosion and Sediment Control measures as specified in the City of Oregon City Public Works Standards for Erosion and Sediment Control. Within three days from the date of notice, the owner or his/her designated representative shall submit a revised Erosion and Sediment Control Plan to the city. Upon approval of the revised plan and issuance of an amended Permit, the owner or his/her designated representative shall immediately implement the revised plan.

G. Approval of an Erosion and Sediment Control Plan does not constitute an approval of permanent road or drainage design (e.g. size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).

17.47.080 Plan Implementation. An approved Erosion Control and Sediment Control Plan shall be implemented and maintained as follows:

A. Plan approval, where required, shall be obtained prior to clearing or grading. No grading, clearing or excavation of land requiring a plan shall be undertaken prior to approval of the plan.

B. The Erosion and Sediment Control facilities shall be constructed prior to any clearing and grading activities, and maintained in such a manner as to ensure that sediment laden water does not enter the drainage system or violate applicable water standards.

C. The implementation of an Erosion and Sediment Control Plan and the construction, maintenance, replacement, and upgrading of erosion and sediment control facilities is the responsibility of the owner or his/her designated representative until all construction is completed and approved, and vegetation, landscaping or approved finished surfaces is established.

D. The erosion and sediment control facilities herein are the minimum requirements for anticipated site conditions. During the construction period, these erosion and sediment control facilities shall be upgraded as needed for unexpected storm events and to ensure that sediment laden water does not leave the site.

E. Any observation of visible or measurable erosion, or an observation of more than a ten-percent increase in downstream channel turbidities, will result in an enforcement action by the City.

F. The owner or his/her designated representative shall implement the measures and construct facilities as provided for and according to the implementation schedule in the approved plan. The Manager shall be allowed reasonable access to the development site for inspection purposes.

17.47.090 Plan Performance Guarantee and Security. After the plan is approved by the Manager and prior to construction or grading, the owner shall provide a financial guarantee. Erosion and sediment control shall be included in the cost estimate for the primary project, such as land division or site plan, and included in that project's performance guarantee.

17.47.100 Correction of Ineffective Measures and Enforcement.

A. If the owner or his/her designated representative fails to follow the plan as approved by the Manager or fails to submit a plan when one is required, the Manager may, after inspecting the property, issue a stop work order halting all work on the development site until the requirements of the plan are met or implemented as applicable. Accompanying the stop work order shall be a written statement or list from the Manager specifying what is wrong and what steps the owner must take to bring the development into compliance. The stop work order shall not be lifted until mitigation measures are implemented that comply with Oregon City performance standards for erosion and sediment control and are approved by the Manager.

B. If the facilities and techniques in the approved plans are not effective or sufficient to meet the purposes of this chapter, based on an on-site inspection, the Manager may require a revision to the plan. Such requirement shall be in writing and shall explain the problem and suggested measures to remedy the problem. The notice shall be presented to the owner and any other responsible parties.

1. The revised plan shall be provided within three business days of when written notification by the Manager is received. Receipt of such notice shall be deemed complete three days after simultaneous regular mail and certified mail is deposited in the mail.
2. The owneror his/her designated representative shall implement fully the revised plan within three business days of receipt of the revised plan as provided in the previous subdivision, or within such other time frame as the Manager may specify.
3. In cases where significant erosion is occurring, the manager may require the owner or his/her designated representative to install immediately interim control measures before submittal of revised plan.
4. If there is a confirmed or imminent threat of significant off-site erosion, the Manager shall issue a stop work order, upon issuance of which work on the development site shall halt. The stop work order shall not be lifted until mitigation measures are implemented that comply with Oregon City performance standards for erosion and sediment control and are approved by the Manager.

C. Enforcement. Erosion that migrates off of a development site is considered to be a nuisance that threatens the health, safety, and welfare of the citizens of Oregon City and is a violation of this chapter. Any owner who violates, or is responsible for a violation or this chapter or an approved plan, shall be subject to the enforcement procedures of this code including by the Code Enforcement Officer.

Section 10. That Title 17: Zoning, Chapter 17.49 WR WATER RESOURCES OVERLAY DISTRICT is hereby repealed and a new Title 17: ZONING, Chapter 17.49: WATER QUALITY RESOURCE AREA OVERLAY DISTRICT is hereby enacted to read as follows:

CHAPTER 17.49

WATER QUALITY RESOURCE AREA OVERLAY DISTRICT

Sections:

17.49.010 Purpose
17.49.020 Definitions
17.49.030 Applicability
17.49.040 Administration
17.49.050 Water Quality Resource Area Standards
17.49.060 Subdivisions and Partitions
17.49.070 Density Transfer
17.49.080 Variances
17.49.090 Map Administration
17.49.100 Consistency
17.49.110 Severability

17.49.010 Purpose. There is established in the city a Water Quality Resource Area Overlay District. The Water Quality Resource Area Overlay District is an overlay zone classification and all conditions and restrictions of land use established by this title of the city's zoning ordinance shall be in addition to such restrictions and conditions as may be imposed and established in underlying zoning districts.

It is the purpose of this chapter to protect and improve water quality, to support beneficial water uses, and to protect the functions and values of existing and newly established Water Quality Resource Areas which provide a vegetated corridor to separate Protected Water Features from development. The vegetated corridor assists in many functions, including, but not limited to, the following:

1. Maintain or reduce stream temperatures;
2. Maintain natural drainage routes, floodplains, and moderate stormwater flows;
3. Reduce potential sediment, nutrient and pollutant loading into water;
4. Provide erosion control, filtration, infiltration and natural water purification; and
5. Maintain channel stability to reduce potential landslides contributing to sedimentation of water features.

17.49.020 Definitions. Unless specifically defined below, words and phases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application.

"Anadromous Fish-Bearing Stream" means a stream or portion of a stream which is identified by resolution of the City Commission as spawning or rearing habitat for those species of fish which return to rivers from the sea for breeding.

"Bankfull Stage" or "Bankfull Flow" means the stage or elevation at which water overflows the natural banks of streams or other waters of this state. The bankfull stage or flow may be approximated using either the two-year recurrence interval flood elevation or one foot measured vertically above the Ordinary Mean High Water Line.

"Beneficial Uses" or "Beneficial Water Uses" means, as defined by the Oregon Department of Water Resources, use of an instream public use of water for the benefit of an appropriator for a purpose consistent with the laws and the economic and general welfare of the people of the state and includes, but is not limited to, domestic, fish life, industrial, irrigation, mining, municipal, pollution abatement, power development, recreation, stockwater and wildlife uses.

"City Engineer" means the Engineer Manager for the City, their duly authorized representative(s), or the City's duly authorized representative(s) as designated by the City Manager.

"Created Wetlands" means wetlands developed in an area previously identified as a non-wetland to replace, or mitigate wetland destruction or displacement. A created wetland shall be regulated and managed the same as an existing wetland.

"Constructed Wetlands" means wetlands developed as a water quality or quantity facility, subject to change and maintenance as such. These areas must be clearly defined and separated from naturally occurring or created wetlands.

"Debris" means discarded man-made objects that would not occur in an undeveloped stream corridor or wetland. Debris includes, but is not limited to, tires, vehicles, litter, scrap metal, construction waste, lumber, plastic or styrofoam. Debris does not include objects necessary to a use allowed by this ordinance, or ornamental and recreational structures. Debris does not include existing natural plant materials or natural plant materials which are left after flooding, downed or standing dead trees or trees which have fallen into protected water features.

"Development" for the purpose of this Chapter the following definition of "development" applies: any manmade change defined as buildings or other structures, mining, dredging, paving, filling, or grading in amounts greater than ten (10) cubic yards on any lot or excavation. In addition, any other activity that results in the removal of more than 10 percent of the existing vegetation in the Water Quality Resource Area on a lot is defined as development. Development does not include the following: a) Stream enhancement or restoration projects approved by the City; b) Farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of this Chapter; and c) Construction on lots in subdivisions meeting the criteria of ORS 92.040(2) (1995).

"Disturb" means man-made changes to the existing physical status of the land, which are made in connection with development. The following uses are excluded from the definition:

1. enhancement or restoration of the Water Quality Resource Area;
2. planting native cover identified in the Oregon City Native Plant List as adopted by Oregon City Commission resolution;
3. installation of erosion control measures pursuant to an approved erosion and sediment control plan under Chapter 17.47.

"Emergency" means any man-made or natural event or circumstance causing or threatening loss of life, injury to person or property, and includes, but is not limited to, fire, explosion, flood, severe weather, drought, earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

"Enhancement" the process of improving upon the natural functions and/or values of an area or feature which has been degraded by human activity. Enhancement activities may or may not return the site to a pre-disturbance condition, but create/recreate processes and features that occur naturally.

"Erosion" means the movement of soil particles resulting from actions of water, wind or mechanical means.

"Fill" means any material such as, but not limited to, sand, gravel, soil, rock or gravel that is placed for the purposes of development or redevelopment.

"Invasive Non-native", "Nuisance", "Prohibited" or "Noxious Vegetation" means plant species that have been introduced and, due to aggressive growth patterns and lack of natural enemies in the area where introduced, spread rapidly into native plant communities, or which are listed as invasive, nuisance, prohibited or noxious plants on the Oregon City Nuisance Plant List.

"Metro" means the regional government of the Portland metropolitan area and the elected Metro Council as the policy setting body of the government.

"Mitigation" means the reduction of adverse effects of a proposed project by considering, in the following order: a) avoiding the impact all together by not taking a certain action or parts of an action; b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; c) rectifying the impact by repairing, rehabilitating or restoring the effected environment; d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action by monitoring and taking appropriate measures; and e) compensating for the impact by replacing or providing comparable substitute water quality resource areas.

"Native Vegetation" means any vegetation listed on the Oregon City Native Plant list as adopted by Oregon City Commission resolution.

"Open Space" means land that is undeveloped and that is planned to remain so indefinitely. The term encompasses parks, forests, and farmland. It may also refer only to land zoned as being available to the public, including playgrounds, watershed preserves, and schools.

"Ordinary Mean High Water Line" means, as defined in OAR 141-82-005, the line on the bank or shore to which water ordinarily rises in season; synonymous with Mean High Water (ORS 274.005).

"Owner or Property Owner" means the person who is the legal record owner of the land, or where there is a recorded land sale contract, the purchaser thereunder.

"Parcel" means a single unit of land that is created by a partitioning of land. (ORS 92.010(7)).

"Partition" means the division of an existing land ownership into two or three parcels, within a calendar year, and is subject to approval of the Governing Body's Land Use and Development Ordinances.

"Practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose.

"Protected Water Features" shall include:

a. Title 3 wetlands;
b. rivers and perennial and intermittent streams;
c. springs which feed stream and wetlands and have year-round flow; and
d. natural lakes.

"Restoration" means the process of returning a disturbed or altered area or feature to a previously existing natural condition. Restoration activities reestablish the structure, function, and/or diversity to that which occurred prior to impacts caused by human activity.

"Resource" versus "Facility" means the distinction being made is between a "resource," a functioning natural system such as a wetland or stream; and a "facility" which refers to a created or constructed structure or drainage way that is designed, constructed and maintained to collect and filter, retain, or detain surface water run-off during and after a storm event for the purpose of water quality improvement.

"Riparian" means those areas associated with streams, lakes and wetlands where vegetation communities are predominately influenced by their association with water.

"Routine Repair and Maintenance" means activities directed at preserving an existing allowed use or facility, without expanding the development footprint or site use.

"Significant Negative Impact" means an impact that affects the natural environment, considered individually or cumulatively with other impacts on the Water Quality Resource Area, to the point where existing water quality functions and values are degraded.

"Steep Slopes" means those slopes that are equal to or greater than 25%. Steep slopes have been removed from the "buildable lands" inventory and have not been used in calculations to determine the number of acres within the urban growth boundary which are available for development.

"Stormwater" means the surface water runoff that results from all natural forms of precipitation.

"Stormwater Quantity Control and Quality Control Facility" means a component of a manmade drainage feature, or features designed or constructed to perform a particular function or multiple functions, including, but not limited to, pipes, swales, ditches culverts, street gutters, detentions basins, retention basins, wet ponds, constructed wetlands, infiltration devices, catch basins, oil/water separators, and sediment basins. Stormwater facilities shall not include building gutters downspouts and drains serving one single-family residence.

"Stormwater Pre-treatment Facility" means any structure or drainage way that is designed, constructed and maintained to collect and filter, retain, or detain surface water run-off during and after a storm event for the purpose of water quality improvement.

"Stream" means areas where surface water produces a defined channel or bed, including bedrock channels, gravel beds, sand and silt beds, and defined-channel swales. The channel or bed does not have to contain water year-round. This definition is not meant to include irrigation ditches, canals, storm or surface water runoff structures, or other artificial watercourses unless they are used to convey streams

naturally occurring prior to construction of such watercourses. For the purposes of this chapter, streams are categorized into two classes: perennial streams and intermittent streams. Perennial stream means a stream that flows year-round during years of normal precipitation. Intermittent stream means a stream that flows only part of the year, or seasonally, during years of normal precipitation.

"Structure(s)" means a building or other major improvement that is built, constructed or installed, or manmade improvements to land that are used, or expected to be used including, but not limited to utility lines, manholes, catch basins, driveways, sidewalks. It does not including minor improvements, such as fences, utility poles, flagpoles or irrigation system components, that are not customarily regulated through zoning codes.

"Title 3" means that part of the Metro Urban Growth Management Functional Plan which requires local governments to comply with Regional regulations. Title 3 is a part of those regional regulations. An ordinance (Ordinance No. 98-730C) adopted by the Metro Council on June 18, 1998.

"Title 3 Wetlands" means wetlands of metropolitan concern as shown on the Metro Water Quality and Flood Management Area Map and other wetlands added to city or county adopted Water Quality and Flood Management Area maps consistent with the criteria in 17.49.090(D). Title 3 wetlands do not include artificially constructed and managed stormwater and water quality treatment facilities.

"Top of Bank" means the same as "bankfull stage."

"Utility Facilities" means buildings, structures or any constructed portion of a system which provides for the production, transmission, conveyance, delivery or furnishing of services including, but not limited to, heat, light, water, power, natural gas, sanitary sewer, stormwater, telephone and cable television. Utility facilities do not include stormwater pre-treatment facilities.

"Vegetated Corridor" means the area of setback between the top of bank of a Protected Water Feature and the delineated edge of the Water Quality Resource Area as defined in Table 1 of this chapter.

"Water Quality Resource Areas" means vegetated corridors and the adjacent protected water feature as established by this Chapter.

"Watershed" means a geographic unit defined by the flows of rainwater or snowmelt. All land in a watershed drains to a common outlet, such as a stream, lake or wetland.

"Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands are those areas identified and delineated by a qualified wetland specialist as set forth in the 1987 Corps of Engineers Wetland Delineation Manual.

17.49.030 Applicability.

A. This chapter shall apply to development in the Water Quality Resource Area Overlay District, which may also be referred to as the "Water Resources Overlay District" in this Code. The overlay zone restricts the uses that are allowed in the base zone by right, with limitations, or as provisional uses.

B. This chapter does not apply to work necessary to protect, repair, maintain, or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies provided that after the emergency has passed, adverse impacts are mitigated in accordance with Table 2, Standards for Restoring Marginal Existing Vegetated Corridors.

C. These standards are in addition to any other applicable standards of this code.

1. Applications for subdivisions, partitions and planned developments shall demonstrate compliance with these standards as part of the review proceedings for those developments;

2. Applications for development other than those described in paragraph 1 of this subsection shall demonstrate compliance with these standards as part of a land use review or limited land use review process as established in Chapter 17.50.

17.49.040 Administration.

A. This chapter establishes a Water Quality Resource Area Overlay District, which is delineated on the Water Quality and Flood Management Areas Map attached and incorporated by reference as a part of this document. The official map is on file in the office of the City Recorder.

1. The Oregon City Local Wetland Inventory, as amended, shall be a reference for identifying areas subject to the Water Quality Resource Area Overlay District.
2. Applicants are required to provide the City with a field verified delineation of the Water Quality Resource Areas on the subject property as part of their application. An application shall not be complete until this delineation is submitted to the City. If the protected water feature is not located on the subject property and access to the water feature is denied, then existing data may be used to delineate the boundary of the Water Quality Resource Area.
3. The standards for development contained in this chapter are applicable to areas located within a Water Quality Resource Area. Applications for development on a site located in the Water Quality Resource Area Overlay District may request a determination that the subject site is not in a Water Quality Resource Area and thus is not subject to the standards of 17.49.050.
   a. Applicants for a determination under this section shall submit a site plan meeting the following requirements:
      i) The site plan must be drawn at a scale of no less than 1"=20';
      ii) The site plan must show the location of the proposed development and the lot lines of the property on which development is proposed;
      iii) The site plan must show the location of the Protected Water Feature. If the Protected Water Feature is a wetland, the delineation must be made by a qualified wetlands specialist pursuant to the 1987 Corps of Engineers Delineation Manual. For all other Protected Water Features, the location must be established by a registered professional engineer or surveyor licensed by the State of Oregon.
      iv) The site plan must show the location of the Water Quality Resource Area;
      v) If the proposed development is closer than 200 feet to the Protected Water Feature, the site plan must include contour intervals of no greater than 5 feet; and
      vi) If the vegetated corridor is fifteen feet, the site plan must show the Protected Water Feature's drainage area, including all tributaries.

   b. Alternatively, an applicant may have the City staff gather the information necessary to determine the location of the Water Quality Resource Area by making an application therefore and paying to the City a fee as set by resolution of the City Commission.

   c. Determinations under this section will be made by the Planning Manager, or designee, as a Type II decision.

4. Compliance with federal and state requirements.
   a. If the proposed development requires the approval of any other governmental agency, such as the Division of State Lands or the U.S. Army Corps of Engineers,

the applicant shall make application for such approval prior to or simultaneously with the submittal of its development application to the city engineer. The planning division shall coordinate city approvals with those of other agencies to the extent necessary and feasible. Any permit issued by the city pursuant to this chapter shall not become valid until other agency approvals have been obtained or those agencies indicate that such approvals are not required.

b. The requirements of this chapter apply only to Water Quality Resource Areas within the Water Quality Resource Area Overlay District. If, in the course of a development review, evidence suggest that a property outside the District may contain a Title 3 wetland or other protected water resource, the provisions of this chapter shall not be applied to that development review. However, the omission shall not excuse the applicant from satisfying any state and federal wetland requirements which are otherwise applicable. Those requirements apply in addition to, and apart from the requirements of the city's comprehensive plan and this code. Additionally, the standards of 17.49.090 shall be applied to the resource and, if the standards of 17.49.090 are met, the District boundaries shall be amended.

B. The City shall review the Water Quality and Flood Management Areas Maps during periodic review as required by ORS 197.633 (1997).

17.49.050 Water Quality Resource Area Standards. This section applies to Water Quality Resource Areas within the Water Quality Resource Area Overlay District.

A. The purpose of this section is to protect and improve the beneficial water uses and functions and values of Water Quality Resource Areas.

B. The Water Quality Resource Area is the vegetated corridor and the Protected Water Feature. The width of the vegetated corridor is specified in Table 1. At least three slope measurements along the water feature, at no more than 50-foot increments, shall be made for each property for which development is proposed. Depending on the slope measurements, the width of the vegetated corridor may vary.

FOR TABLE 1 REFER TO NEXT PAGE

TABLE 1
Width of Vegetated Corridor

Protected Water Feature Type (see definitions)	Slope Adjacent to Protected Water Feature	Starting Point for Measurements from Water Feature	Width of Vegetated Corridor (See Note #1)
Anadromous fish-bearing streams	Any slope	• Edge of bankfull flow	200 feet
Intermittent streams with slopes less than 25 percent and which drain less than 100 acres	< 25 percent	• Edge of bankfull flow	15 feet
All other Protected Water Features	<25 percent	• Edge of bankfull flow • Delineated edge of Title 3 Wetland	50 feet
	≥ 25 percent for 150 feet or more (see Note #2).		200 feet
	≥ 25 percent for less than 150 feet (see Note #2).		Distance from starting point of measurement to top of ravine (break in ≥25 percent slope) (see Note #3) plus 50 feet.

Notes:

1. Required width (measured horizontally) of vegetated corridor unless reduced pursuant to the provisions of 17.49.050(I).
2. Vegetated corridors in excess of 50 feet apply on steep slopes only in the uphill direction from the protected water feature.
3. Where the Protected Water Feature is confined by a ravine or gully, the top of the ravine is the break in the ≥25 percent slope.

C. Uses Permitted Outright

1. Stream, wetland, riparian and upland enhancement or restoration projects; and farming practices as defined in ORS 30.930 and farm uses, excluding buildings and structures, as defined in ORS 215.203.
2. Placement of structures that do not require a grading or building permit.
3. Routine repair and maintenance of existing structures, roadways, driveways, utility facilities, accessory uses and other development.

D. Uses Under Prescribed Conditions

1. Repair, replacement or improvement of utility facilities where the disturbed portion of the Water Quality Resource Area is restored and vegetation is replaced with vegetation from the Oregon City Native Plant List.
2. Additions, alterations, rehabilitation, or replacement of existing structures that do not increase existing structural footprint in and will have no greater material adverse impact on the Water Quality Resource Area where the disturbed portion of the Water Quality Resource Area is restored using native vegetative cover.
3. Public capital improvement projects that comply with the development standards of this chapter. The City Engineer will determine compliance with Water Quality Resource Area standards.

E. Provisional Uses

The following uses are allowed in the Water Quality Resource Area subject to compliance with the Application Requirements and Development Standards of subsections G and H:

1. Any use allowed in the base zone, other than those listed in subsection C and D above.
2. Measures to remove or abate nuisances, or any other violation of State statute, administrative agency rule or City ordinance.
3. Roads to provide access to Protected Water Features or necessary ingress and egress across Water Quality Resource Areas.
4. New public or private utility facility construction.
5. Walkways and bike paths. (subsection H.5).
6. New stormwater pre-treatment facilities (subsection H.6).
7. Widening an existing road adjacent to or running parallel to a Water Quality Resource Area.
8. Additions, alterations, rehabilitation or replacement of existing structures, roadways, accessory uses and development that increase the structural footprint within the Water Quality Resource Area consistent with Subsection H.7.

F. Prohibited Uses

1. Any new development, other than that listed in subsection C, D and E.
2. Uncontained areas of hazardous materials as defined by the Department of Environmental Quality.

G. Application Requirements

Applications for Provisional Uses in the Water Quality Resource Area must provide the following information in a water resources report in addition to the information required for the base zone.

1. A topographic map of the site at contour intervals of five feet or less showing a delineation of the Water Quality Resource Area, which includes areas shown on the City Water Quality and Flood Management Areas map.

2. The location of all existing natural features including, but not limited to, all trees of a caliper greater than six (6) inches diameter at a height of four feet, natural or historic drainages on the site, springs, seeps and outcroppings of rocks, or boulders within the Water Quality Resource Area.
3. Location of Title 3 wetlands. Where Title 3 wetlands are identified, the applicant shall follow the Division of State Lands recommended wetlands delineation process. The delineation shall be prepared by a professional wetlands specialist.
4. An inventory and location of existing debris and nuisance plants.
5. An assessment of the existing condition of the Water Quality Resource Area in accordance with Table 2.
6. An inventory of vegetation, including percentage ground and canopy coverage.
7. An analysis of the impacts the proposed development may have on the Water Quality Resource Area. This discussion shall take into account relevant natural features and characteristics of the Water Quality Resource Area, including hydrology, soils, bank stability, slopes of lands abutting the water resources, hazards of flooding, large trees and wooded features. The discussion shall identify fish and wildlife resources that utilize or inhabit the impact area in the course of a year and the impact of the proposed development on water resource values;
8. An analysis of the impacts the proposed development will have on the water quality of affected water resources, taking into account relevant natural features and characteristics of the Water Quality Resource Area;
9. An analysis of measures which feasibly can be taken to reduce or mitigate the impact of the proposed development on the Water Quality Resource Area and their vegetated corridors, including proposed drainage and erosion control measures, and an analysis of the effectiveness of these measures;
10. The water resources report shall be prepared by one or more qualified professionals including a wetlands biologist or hydrologist whose credentials are presented in the report.

11. Alternatives analysis demonstrating that:
    a. No practicable alternatives to the requested development exist that will not disturb the Water Quality Resource Area;
    b. Development in the Water Quality Resource Area has been limited to the area necessary to allow for the proposed use;
    c. The Water Quality Resource Area can be restored to an equal or better condition in accordance with Table 2;
    d. It will be consistent with a Water Quality Resource Area Mitigation Plan;
    e. An explanation of the rationale behind choosing the alternative selected, including how adverse impacts to resource areas will be avoided or minimized and mitigated.
    f. For applications seeking an alteration, addition, rehabilitation or replacement of existing structures:
        (1) Demonstrate that no reasonably practicable alternative design or method of development exists that would have a lesser impact on the Water Quality Resource Area than the one proposed; and
        (2) If no such reasonably practicable alternative design or method of development exists, the project should be conditioned to limit its disturbance and impact on the Water Quality Resource Area to the minimum extent necessary to achieve the proposed addition, alteration, restoration, replacement or rehabilitation; and

(3) Provide mitigation to ensure that impacts to the functions and values of the Water Quality Resource Area will be mitigated or restored to the extent practicable.

12. A Water Quality Resource Area Mitigation Plan shall be prepared by a registered professional engineer, landscape architect, biologist, or other person trained or certified to determine that the vegetated corridor meets the requirements of Table 2 and shall contain the following information:
    a. A description of adverse impacts that will be caused as a result of development.
    b. An explanation of how adverse impacts to resource areas will be avoided, minimized, and/or mitigated in accordance with, but not limited to, Table 2.
    c. A list of all responsible parties including, but not limited to, the owner, applicant, contractor or other persons responsible for work on the development site.
    d. A map showing where the specific mitigation activities will occur.
    e. A maintenance program assuring plant survival for a minimum of three years.
    f. An implementation schedule, including timeline for construction, mitigation, mitigation maintenance, monitoring, reporting and a contingency plan. All in-stream work in anadromous fish-bearing streams shall be done in accordance with the Oregon Department of Fish and Wildlife in-stream timing schedule.

H. Development Standards

Applications for Provisional Uses in the Water Quality Resource Area shall satisfy the following standards:

1. The Water Quality Resource Area shall be restored and maintained in accordance with the mitigation plan and the specifications in Table 2.
2. Existing vegetation shall be protected and left in place. Work areas shall be carefully located and marked to reduce potential damage to the Water Quality Resource Area. Trees in the Water Quality Resource Area shall not be used as anchors for stabilizing construction equipment.
3. Where existing vegetation has been removed, or the original land contours disturbed, the site shall be revegetated during the next planting season. Nuisance plants, as identified in the Oregon City Nuisance Plant List, may be removed at any time. Interim erosion control measures such as mulching shall be used to avoid erosion on bare areas. Removed nuisance plants shall be replaced with plants from Oregon City's Native Plant List by the next planting season.
4. Prior to construction, the Water Quality Resource Area shall be flagged, fenced or otherwise marked and shall remain undisturbed except as allowed in subsection E. Such markings shall be maintained until construction is complete.
5. Walkways and bike paths:
    a. A gravel, earthen, tree bark product, or equivalent walkway or bike path shall not be constructed closer than 10 feet from the boundary of the Protected Water Feature. Walkways and bike paths shall be constructed so as to minimize disturbance to existing vegetation. Where practicable, a maximum of 50 percent of the trail may be within 30 feet of the Protected Water Feature.
    b. A paved walkway or bike path shall not be constructed closer than 10 feet from the boundary of the Protected Water Feature. For any paved walkway or bike path, the width of the Water Quality Resource Area must be increased by a distance equal to the width of the paved path. Walkways and bike paths shall be constructed so as to minimize disturbance to existing vegetation. Where practicable, a maximum of 25 percent of the trail may be within 30 feet of the Protected Water Feature; and
    c. A walkway or bike path shall not exceed 12 feet in width.

6. Stormwater quantity control and quality control facilities:
   a. Except for flood control facilities designated by adopted Oregon City stormwater master plans, the stormwater quantity control and quality control facility may encroach a maximum of 25 feet into the outside boundary of the Water Quality Resource Area of a Protected Water Feature, (maximum allowable encroachment to be proportionally reduced for applicable intermittent stream vegetated corridor;
   b. The area of encroachment must be replaced by adding an equal area to the Water Quality Resource Area on the subject property; and
   c. All stormwater shall be collected on-site and passed through a treatment facility, such as a detention/composting facility or filter as approved by the city engineer in consultation with planning staff, prior to being discharged into the Water Quality Resource area.
   d. The Water Quality Resource Area shall not be subject to a significant negative impact as a result of changes to existing hydrologic connections.
7. Additions, alterations, rehabilitation and replacement of lawful structures.
   a. For existing structures, roadways, driveways, accessory uses and development which are nonconforming, this chapter shall apply in addition to the nonconforming use regulations of this title (Chapter 17.58).
   b. Additions, alterations, rehabilitation or replacement of existing structures, roadways, driveways, accessory uses and development shall not encroach closer to and will have no greater material adverse impact on the Protected Water Feature than the existing structures, roadways, driveways, accessory uses and development.
8. Off-site Mitigation:
   a. Where the alternatives analysis demonstrates that there are no practicable alternatives for mitigation on site, off-site mitigation shall be located as follows:
      (1) As close to the development as is practicable above the confluence of the next downstream tributary, or if this is not practicable;
      (2) Within the watershed where the development will take place or as otherwise specified by the City in an approved Wetland Mitigation Bank.
   b. In order to ensure that the mitigation area will be protected in perpetuity, proof that a deed restriction has been placed on the property where the mitigation is to occur is required.

FOR TABLE 2 REFER TO NEXT PAGE

TABLE 2
Water Quality Resource Area Mitigation Requirements

Existing Condition Of Water Quality Resource Area	Mitigation Requirements
Good Existing Corridor: Combination of trees, shrubs and groundcover are 80% present, and there is more than 50% tree canopy coverage in the vegetated corridor.	1. Prior to construction, a biologist or landscape architect shall prepare and submit an inventory of vegetation in areas proposed to be disturbed and a plan for mitigating water quality impacts related to the development, including: sediments, temperature nutrients, sediment control, temperature control, or addressing any other condition that may have caused the Protected Water Feature to be listed on DEQ's 303 (d) list. 2. Inventory and remove debris and noxious materials.
Marginal Existing Vegetated Corridor: Combination of trees, shrubs and groundcover are 80% present, and 25-50 percent canopy coverage in the vegetated corridor.	1. Restore and mitigate according to approved plan using non-nuisance plantings from Native Plants List. 2. Inventory and remove debris and noxious materials. 3. Vegetate disturbed and bare areas with non-nuisance plantings from the Oregon City Native Plant List. 4. Revegetate with native species using a City approved plan developed to represent the vegetative composition that would naturally occur on the site. Seeding may be required prior to establishing plants for site stabilization. 5. Revegetation must occur during the next planting season following site disturbance. Annual replacement of plants that do not survive is required until vegetation representative of natural conditions is established on the site.
Degraded Existing Vegetated Corridor: Less vegetation and canopy coverage than Marginal Vegetated Corridors, and/or Greater than 10% surface coverage of any non-native species	1. Restore and mitigate according to approved plan using non-nuisance plantings from the Oregon City Native Plant List. 2. Inventory and remove debris and noxious materials. 3. Remove non-native species and revegetate with non-nuisance plantings from the Oregon City Native Plant List. 4. Vegetate disturbed and bare areas with appropriate plants from the Oregon City Native Plant List. 5. Plant and seed to provide 100 percent surface coverage.

I. Vegetated Corridor Width Reduction.
A reduction in the width of the vegetated corridor required by Table 1 may be allowed as part of a Type III proceeding under the following conditions:

1. On slopes that are greater than or equal to 25% for less than 150 feet, a maximum reduction of 25 feet may be permitted in the width of vegetated corridor beyond the slope break if a geotechnical report demonstrates that the slope is stable.

2. On an anadromous fish-bearing stream, the 200 foot vegetated corridor may be reduced if the following criteria are met:

   a. The existing condition of the vegetated corridor is primarily developed with commercial, industrial or residential uses or is significantly degraded with less than 25% vegetative cover;
   b. A decrease is necessary to accomplish the purposes of the proposal and no practicable alternative is available;
   c. Decreasing the width of the vegetated corridor will not adversely affect the water resource functional values. The functional values of a water resource include, but are not limited to, the following: water quality protection and enhancement; fish and wildlife habitat; food chain support; flood storage, conveyance and attenuation; groundwater recharge and discharge; erosion control; historical and archaeological and aesthetic value; and recreation;
   d. Improvements will be made to the remaining vegetated corridor pursuant to the mitigation requirements of the section on Degraded Existing Vegetation Corridor in Table 2 of this chapter. The applicant must demonstrate that the improvements will increase the functional values of the water resource.
   e. A proposal to enhance a vegetated corridor shall not be used as justification to reduce an otherwise functional standard corridor width.
   f. In no case may the reduced corridor be less than otherwise would be required by Table 1 for a non-anadromous fish-bearing stream.

17.49.060 Subdivisions and Partitions.

A. The purpose of this section is to amend the City regulations governing land divisions to require that new subdivision and partition plats delineate and show the Water Quality Resource Area as either a separate tract or part of a larger tract that meets the requirements of 17.49.060 (D).

B. The standards for land divisions in a Water Quality Resource Area Overlay District shall apply in addition to the requirements of the City land division ordinance and zoning ordinance, provided that for partitions the minimum lot area, minimum average lot width, and minimum average lot depth standards of the base zone may be superseded in order to allow for a transfer of density pursuant to 17.49.070.

C. Prior to preliminary plat approval, the Water Quality Resource Area shall be shown either as a separate tract or part of a larger tract that meets the requirements of 17.49.060 (D), which shall not be a part of any parcel used for construction of a dwelling unit.

D. Prior to final plat approval, ownership of the Water Quality Resource Area tract shall be identified to distinguish it from lots intended for sale. The tract may be identified as any one of the following:
   1. Private open space held by the owner or a homeowners association; or
   2. For residential land divisions, private open space subject to an easement conveying storm and surface water management rights to the City and preventing the owner of the tract from activities and uses inconsistent with the purpose of this document; or

3. At the owner's option, public open space where the tract has been dedicated to the City or other governmental unit; or
4. Any other ownership proposed by the owner and approved by the City Manager.

17.49.070 Density Transfers.

A. The purpose of this section is to allow density accruing to portions of a property within the Water Quality Resource Area to be transferred outside the Water Quality Resource Area.

B. Development applications for subdivisions that request a density transfer shall be proposed as part of a Planned Unit Development and shall comply with chapter 17.64, Planned Unit Development.

C. Development applications for partitions that request a density transfer shall:
1. Provide a map showing the net buildable area to which the density will be transferred.
2. Provide calculations justifying the requested density increase.
3. Demonstrate that the minimum lot size requirements can be met based on an average of all lots created, including the Water Quality Resource Area tract created pursuant to 17.49.060, and that no residential lot created is less than 5000 sq. ft.
4. Demonstrate that, with the exception of the Water Quality Resource Area parcel created pursuant to 17.49.060, no parcels have been created which would be unbuildable in terms of minimum yard setbacks.
5. Meet all other standards of the base zone.

D. The area of land contained in a Water Quality Resource Area may be excluded from the calculations for determining compliance with minimum density requirements of the zoning code.

17.49.080 Variances.

A. The purpose of this Section is to ensure that compliance with this chapter does not cause unreasonable hardship. To avoid such instances, the requirements of this chapter may be varied. Variances are also allowed when strict application of this chapter would deprive an owner of all economically viable use of land.

B. This Section applies to requests to vary from the standards of Chapter 17.49 only. Requests to vary from other standards of Title 17 shall be subject to the requirements of Chapter 17.60.
1. Variance applications made pursuant to this section shall follow the variance procedures outlined in 17.60.
2. In addition to the public notice requirements outlined in 17.50.090, Metro shall be notified within 14 days of the City receiving an application to vary the requirements of this section and within 14 days of a decision on the variance.
3. The requirements of Section 17.60.020 (Variances -- Grounds) do not apply to requests to vary from the standards of Chapter 17.49.
4. If an application to vary from the standards of Chapter 17.49 is made in conjunction with an application to vary from other standards of Title 17, the variances may be processed as one application provided the standards applicable to each variance requested must be met before the requested variance may be granted.

C. Development may occur on lots located completely within the Water Quality Resource Area that are recorded with the county assessor's office on or before the date this chapter is adopted. Development shall not disturb more than 5,000 square feet of the vegetated corridor, including access roads and driveways, subject to the erosion and sediment control standards of this document.

D. Hardship Variance

Variances to avoid unreasonable hardship caused by the strict application of this chapter are permitted subject to the criteria set forth in this section. To vary from the requirements of this chapter, the applicant must demonstrate the following:

1. The variance is the minimum necessary to allow the proposed use or activity;
2. The variance does not increase danger to life and property due to flooding or erosion;
3. Unless the proposed variance is from Section 17.49.050(G)(12) (mitigation), the proposed use will comply with those standards; and
4. The proposed use complies with the standards of the base zone and other applicable overlay districts.

E. Buildable Lot Variance

A variance to avoid the loss of all economically viable use of a lot that is partially inside the Water Quality Resource Area is permitted. Development on such lots shall not disturb more than 5,000 square feet of the vegetated corridor. Applicants must demonstrate the following:

1. Without the proposed variance, the applicant would be denied economically viable use of the subject property. To meet this criterion, the applicant must show that:
   a. The proposed use cannot meet the standards in Section 17.49.080(D) (hardship variance); and
   b. No other application could result in permission for an economically viable use of the subject property. Evidence to meet this criterion shall include a list of uses allowed on the subject property.
2. The proposed variance is the minimum necessary to allow for the requested use;
3. The proposed variance will comply with Section 17.49.050(G)(12) (mitigation); and
4. The proposed use complies with the standards of the base zone and other applicable overlay districts.

F. Variance Conditions

The Planning Commission may impose such conditions as are deemed necessary to limit any adverse impacts that may result from granting relief. If a variance is granted pursuant to subsections 17.49.080(D), the variance shall be subject to the following conditions:

1. The minimum width of the vegetated corridor shall be 15 feet on each side of a Protected Water Feature, except as allowed in Section 17.49.080(E);
2. At least 75 percent of the length of the Water Quality Resource Area for a Protected Water Feature within a development site shall be greater than 30 feet in width on each side of the water feature.

17.49.090 Map Administration.

A. The purpose of this section is to provide a process for amending the Water Quality and Flood Management Areas Map to add wetlands and correct the location of Protected Water Features and the Water Quality Resource Area Overlay District if the Protected Water Feature does not exist or is outside the Water Quality Resource Area Overlay District. The information used to establish an error shall include a topographic map of the site with contour intervals no greater than 5 feet and a report qualifying the map amendment prepared by a registered professional engineer licensed by the State of Oregon or a qualified wetland specialist.

B. Map Corrections shall be processed pursuant to the requirements of Chapter 17.68.

1. Within 90 days of receiving information establishing an error in the existence or location of a Protected Water Feature, the City shall provide notice to interested parties of a public hearing at which the City will review the information.

2. The City shall amend the Water Quality and Flood Management Areas Map if the information demonstrates:
   a. That a Protected Water Feature no longer exists because the area has been legally filled, culverted or developed prior to the adoption of the amendment of Title 3 of the Functional Plan (June 18, 1998); or
   b. That the Protected Water Feature does not exist or is outside the Water Quality Resource Area Overlay District.

C. Modification of the Water Quality Resource Area Overlay District
To modify the Water Quality Resource Area Overlay District, the applicant shall demonstrate that the modification will offer the same or better protection of the Protected Water Feature and Water Quality Resource Area by:
1. Preserving a vegetated corridor that will separate the Protected Water Feature from proposed development; and

2. Preserving existing vegetated cover or enhancing the Water Quality Resource Area sufficient to assist in maintaining or reducing water temperatures in the adjacent Protected Water Feature; and

3. Enhancing the Water Quality Resource Area sufficient to minimize erosion, nutrient and pollutant loading into the adjacent Protected Water Feature; and

4. Protecting the vegetated corridor sufficient to provide filtration, infiltration and natural water purification for the adjacent Protected Water Feature; and

5. Stabilizing slopes adjacent to the Protected Water Feature.

D. Adding Title 3 Wetlands
1. Within 90 days of receiving evidence that a wetland meets any of one of the criteria in this Section, the City shall provide notice to interested parties of a public hearing at which the City will review the evidence.
2. A wetland and its vegetated corridor shall be included in the Water Quality Resource Area Overlay District if the wetland meets any one of the following criteria:
   a. The wetland is fed by surface flows, sheet flows or precipitation, and has evidence of flooding during the growing season, and has 60 percent or greater vegetated cover, and is over one-quarter acre in size;
   or the wetland qualifies as having "intact water quality function" under the 1996 Oregon Freshwater Wetland Assessment Methodology; or
   b. The wetland is in the Flood Management Area, and has evidence of flooding during the growing season, and is five acres or more in size, and has a restricted outlet or no outlet;
   or the wetland qualifies as having "intact hydrologic control function" under the 1996 Oregon Freshwater Wetland Assessment Methodology; or
   c. The wetland or a portion of the wetland is within a horizontal distance of less than one-fourth mile from a water body which meets the Department of Environmental Quality definition of "water quality limited water body" in OAR Chapter 340, Division 41 (1996).

17.49.100 Consistency. Where the provisions of this chapter are less restrictive or conflict with comparable provisions of the zoning ordinance, regional, state or federal law, the provisions that are more restrictive shall govern. Where this document imposes restrictions that are more stringent than regional, state and federal law, the provisions of this document shall govern.

17.49.110 Severability. The provisions of this chapter are severable. If any section, clause or phrase of this chapter is adjudged to be invalid by a court of competent jurisdiction, the decision of that court shall not affect the validity of the remaining portions of this ordinance.

Section 11. Emergency clause. Because this ordinance is necessary for the preservation of the peace, public health, safety and welfare of Oregon City and to provide for an orderly transition in a reasonable time to the regulatory system, an emergency is hereby declared to exist and this ordinance shall be in full force and effect from the time of passage by the Commission.

Read for the first time at a regular meeting of the City Commission held on the 6th day of October, 1999, and the foregoing ordinance was finally enacted by the Commission this 6th day of October, 1999.

JEAN K. ELLIOTT, City Recorder

ATTESTED to this 6th day of October, 1999.

JOHN F. WILLIAMS, Jr., Mayor

ORDINANCE NO. 99-1013

Effective Date: October 6, 1999

Agenda Item No. 5

CITY OF OREGON CITY

INCORPORATED 1844

COMMISSION REPORT

FOR AGENDA

DATED

October 6, 1999

TO THE HONORABLE MAYOR AND COMMISSIONERS

Subject: **Proposed Ordinance No. 99-1013**
An Ordinance Implementing the Requirements of Title 3..., and Declaring an Emergency
(Planning File No. PZ 98-04)

Report No. 99-182

BACKGROUND

On September 15, 1999, the City Commission conducted a public hearing on proposed Ordinance No. 99-1013 which implements the requirements of Metro Title 3: Water Quality and Flood Management Conservation of the Urban Growth Management Functional Plan. The public hearing was closed and on a roll call vote of 2-Aye and 1-Nay on first reading, second reading was continued to the next agenda. Therefore, on the October 6, 1999 agenda is proposed Ordinance No. 99-1013 is again proposed for adoption with clause declaring an emergency. (copy of ordinance text attached) which implements the requirements of Metro Title 3 and declares an emergency.

In response to testimony presented and City Commission discussion at the September 15, 1999 public hearing, text revisions have been made to the ordinance and to the City of Oregon City Public Works Standards for Erosion and Sediment Control. In addition: 1) staff has assembled technical documents for distribution that support the ordinance; 2) the City Attorney has prepared supplemental findings; and 3) the City Attorney has prepared responses to Title 3 objections raised in the course of public hearings. These are being presented for the public record. Because of these revisions and additions, it is recommended that the public hearing be re-opened.

The ordinance text revisions and additional information are presented in this report. The following attachments accompany this report:

a) Attachment 1 - Excerpts from City of Oregon City Public Works Standards for Erosion and Sediment Control showing revisions using underline/strikeout format.
b) Attachment 2 - "Supplemental Findings and Conclusions - Ordinance No. 99-1013" , Ordinance No. 99-1013, Exhibit D;
c) Attachment 3 - "Policy Analysis and Scientific Literature Review For Title 3 of the Urban Growth Management Functional Plan: Water Quality and Floodplain Management Conservation, July 1997";
d) Attachment 4 - "A Literature Review of Recommended Buffer Widths to Maintain Various Functions of Stream Riparian Areas, February 1992";
e) Attachment 5 - "Forest Ecosystem Management: An Ecological, Economic, and Social Assessment, July 1988";
f) Attachment 6 - "Oregon's Final 1998 Water Quality Limited Streams - 303(d) List"; and
g) Attachment 7 - September 30, 1999 Preston Gates & Ellis Memorandum, "Title 3 Objections that Have Been Raised in the Course of Public Hearings".

Please refer to staff reports and minutes prepared for the July 7 (City Commission Report No. 99-131), September 1, 1999 (City Commission Report No. 99-164), and September 15, 1999 (City Commission Report No. 99-173) for details and materials presented at the previous public hearings.

SUMMARY OF ORDINANCE TEXT REVISIONS

City staff and legal counsel carefully reviewed testimony and City Commission discussion presented at the September 15, 1999 public hearing. Revisions were made where deemed appropriate and an improvement

Subject: **Proposed Ordinance No. 99-1013** **Report No. 99-173**
An ordinance implementing the requirements of Title 3...

to the ordinance implementation while retaining the objectives of Title 3 and State Land Use Goals 6 and 7.

Revisions in Response to September 14, 1999 FEMA Letter

1. Code Section 17.42.090 (A)(1) (see page 15 of the proposed ordinance) was revised to include specific reference to Clackamas County maps (map title clarification).
2. Previous Code Section 17.42.090 (A)(1)(e) was deleted because it was redundant to Code Section 17.42.110 (see page 16 of the proposed ordinance) which exclusively addresses Use of Other Base Flood Data.
3. Code Section 17.42.130 (A) (see page 17 of the proposed ordinance) was revised from Division of State Lands to Department of Land Conservation and Development.

Revisions in Response to September 15, 1999 Home Builders Association of Metropolitan Portland Letter

1. Findings were included in the ordinance (see page 2 of proposed ordinance) to address constrained lands and buildable land inventory in Oregon City. Additional findings read:

   "WHEREAS, the overlay districts created by this ordinance incorporate vacant, constrained land consisting of floodplains, slopes of over 25 percent, flood-prone soils, wetlands, parks, and water features such as lakes, rivers, and streams, said lands being omitted from designation as land on which the city is obligated to provide for housing opportunities only; and

   WHEREAS, the city has determined that buildable lands for housing opportunities are available, and can be made available over time, outside the boundaries of the water quality overlay districts created by this ordinance; and

   WHEREAS, housing opportunities are available within the water quality overlay districts created by this ordinance on site-by-site basis; and

   WHEREAS, the city will continue to monitor the balance between the purposes of this ordinance and the city's overall supply of land available for housing opportunities."

2. Code Section 17.47.020 (see page 24 of proposed ordinance); the definition of "Development" was revised to provide exclusion for "(c) construction on lots in subdivisions meeting the criteria of ORS 92.040(2)(1995)".

3. Code Section 17.47.070 (B) (see page 26 of proposed ordinance) was revised to provide clear and objective standards for Erosion and Sediment Control Plan approval.

4. Code Section 17.47.070 (B)(1) and (F) and 17.47.080© and (F) and 17.47.100 (see pages 26 and 27 of the proposed ordinance) was revised from either "owner", "applicant", or "permittee" to "owner or his/her designated representative" to clarify responsibility for erosion and sediment control. Please note that similar revisions were made in the Oregon City Public Works Standards for Erosion and Sediment Control (see Staff Report - Attachment 1).

5. Code Section 17.47.080(E) and 17.47.100(A) and (B)(4) (see page 27 of the proposed ordinance) were revised to provide clear and objective standards for lifting a Stop Work Order.

Revisions in Response to Mr. Bean's Testimony

1. Code Section 17.49.010 (see page 28 of proposed ordinance) was revised to clarify the language used to convey the purpose of the chapter and the functions and values of Water Quality Resource Areas and vegetated corridors.

Subject: **Proposed Ordinance No. 99-1013** **Report No. 99-173**
An ordinance implementing the requirements of Title 3...

Revisions in Response to City Commission Discussion

1. Code Section 17.49.050(H)(6)(a) (see page 38 of proposed ordinance) was revised to provide instruction for maximum allowable encroachment into vegetated corridors associated with intermittent streams.

Revisions in Response to Staff Comments

1. Code Section 17.49.050(G) (see page 35 of proposed ordinance) was revised to indicate that information accompanying applications for Provisional Uses in a Water Quality Resource Area would be presented in a water resources report.
2. Code Section 17.49.050(G)(12) (see page 37 of proposed ordinance) was revised to clarify that a Water Quality Resource Area Mitigation Plan shall be prepared by a registered professional engineer, landscape architect, biologist, or other person trained or certified to determine that the vegetated corridor meets the requirements of Table 2 (Water Quality Resource Area Mitigation Requirements).

ADDITIONAL INFORMATION TO CLARIFY RECORD

The following information is presented to clarify issues that have been raised through the public hearing process. Additional technical references are presented (including documents attached to this staff report) to distribute some of the information that has been used to develop the proposed ordinance.

1. Criteria for Mapping Streams Draining Less Than 50 Acres: In response to public testimony and City Commission direction, staff mapped streams in Oregon City that appear to drain less than 50 acres and included them on the Water Quality and Flood Management Areas Map. The mapping was based on 1) topography (contours illustrating drainage routes upgradient from previously mapped streams draining greater than 50 acres; and 2) public input (citizens reported knowledge of stream locations).

2. Vegetated Corridor Widths - Their Functions and Dimensional Needs: The vegetated corridor along a stream or wetland contributes to water quality protection by reducing sediment load to the stream or wetland; removing excess nutrients and metals; and moderating water temperatures. Vegetated corridors offer hazard protection by stabilizing stream channels and offering flood storage capacity (much as a larger pipe can offer greater conveyance capacity than a smaller pipe at the same gradient). The vegetated corridor contributes to biologic and ecologic diversity by generating woody debris.

   In the proposed ordinance streams include intermittent streams and perennial streams; the difference being that water normally flows continually in perennial streams. However, there is no distinction between vegetated corridor function along perennial streams versus intermittent streams. They serve the same purpose whether or not water flows continually or seasonally. The vegetated corridor functions beyond the stream flowline; filtering and absorbing pollutants, providing erosion control, and cooling temperatures before surface water flows enter the main channel.

   The vegetated corridor width needed to successfully perform its functions has been evaluated extensively. Widths ranging from 15 to 30 meters (approximately 45 to 90 feet) have been cited to be effective in controlling stream temperature. Widths ranging from 3 meters (for sandy soils) to 122 meters (for clay soils) (approximately 9 to 370 feet) are recommended for sediment reduction. Widths ranging from 16 to 30 meters (approximately 50 to 90 feet) are most frequently recommended for excess nutrient and metals removal. The 50 to 200-foot typical vegetated corridor width requirements

Subject: **Proposed Ordinance No. 99-1013** **Report No. 99-173**
An ordinance implementing the requirements of Title 3...

of the proposed ordinance are well within the above recommendation. The 200-foot requirement also considers that, in the presence of steep slopes, bank stability and bank erosion issues compound the need for hazard protection.

3. Constrained Land Relative to Buildable Land Inventory: The Water Quality Resource Area Overlay District and the Water Quality and Flood Management Areas Map do not represent constrained land, but identify an overlay district or area where water resources and natural hazards must be considered as part of a development application. The actual limits of restriction and/or mitigation would be defined through the application process. The majority of land expected to be impacted by water resource protection in Oregon City was included in the constrained land mapped for Oregon City in 1996. Additions due to previously unmapped protected water features are considered minor because they typically represent either a) streams for which required vegetated corridor widths are only 15 feet; or b) existing developed areas.

There are costs associated with confirming or denying potential restrictions where water resources are present. There are also costs associated with recovering beneficial uses of unprotected water resources that have been negatively impacted. For public good, it is important to seek a balance by requiring enough protection to avoid future reclamation.

RECOMMENDATION

Proposed Ordinance #99-1013 is comprised of:
1) The ordinance text (attached);
2) The Water Quality and Flood Management Areas Map and FEMA maps (considered to be Exhibit A to the ordinance and available for inspection at City Hall).
3) The Oregon City Local Inventory and Riparian Assessment (considered to be Exhibit B to the ordinance and available for inspection at City Hall);
4) The City of Oregon City Public Works Standards for Erosion and Sediment Control (considered to be Exhibit C to the ordinance and available for inspection at City Hall).
5) Supplemental Findings and Conclusions - Ordinance No. 99-1013 (considered to be Exhibit D to the ordinance and included with this report as Attachment 2).

Notice of proposed Ordinance No. 99-1013 has been posted at City Hall, Municipal Elevator, and Pioneer Community Center by direction of the City Recorder. It is recommended that the City Commission approve first and second readings for final enactment of Ordinance No. 99-1013 to become effective immediately.

Chris Jordan
Interim City Manager

Attachments
Report prepared by: Nancy J.T. Kraushaar, P.E., Senior Engineer

c: Metro, Interim Public Projects Manager, Planning Manager, Engineering Manager, Public Works Manager

\\FS2\VOL2\WPFILES\NANCY-K\TITLE3\ADOPTION\CITYCOMM10-6-99.RPT

ISSUED BY THE CITY MANAGER

N O T I C E

NOTICE IS HEREBY GIVEN that proposed ORDINANCE NO. 99-1013, of the City of Oregon City, Clackamas County, Oregon, three copies of which are available for public inspection at the office of the City Recorder, 320 Warner Milne Road, Oregon City, Oregon.

Said Ordinance will be considered by the City Commission at its meeting on the 6th day of October, 1999, at the hour of 7:00 o'clock p.m. The title of said Ordinance is as follows:

AN ORDINANCE IMPLEMENTING THE REQUIREMENTS OF METRO TITLE 3...AND DECLARING AN EMERGENCY

NOTE: The entire Ordinance Title, Oregon City Public Works Erosion and Sediment Control Plan, Wetlands Inventory, Water Quality and Flood Management Map, and the Findings are available for review at City Hall.

POSTED this 29th day of September, 1999, by direction of the City Recorder. Places of posting are as follows:

1. City Hall, 320 Warner Milne Road, Oregon City, Oregon.
2. Municipal Elevator, 300 Seventh Street, Oregon City, Oregon.
3. Pioneer Community Center, 615 5th Street, Oregon City, Oregon.

JEAN K. ELLIOTT, City Recorder

DO NOT REMOVE PRIOR TO OCTOBER 7, 1999

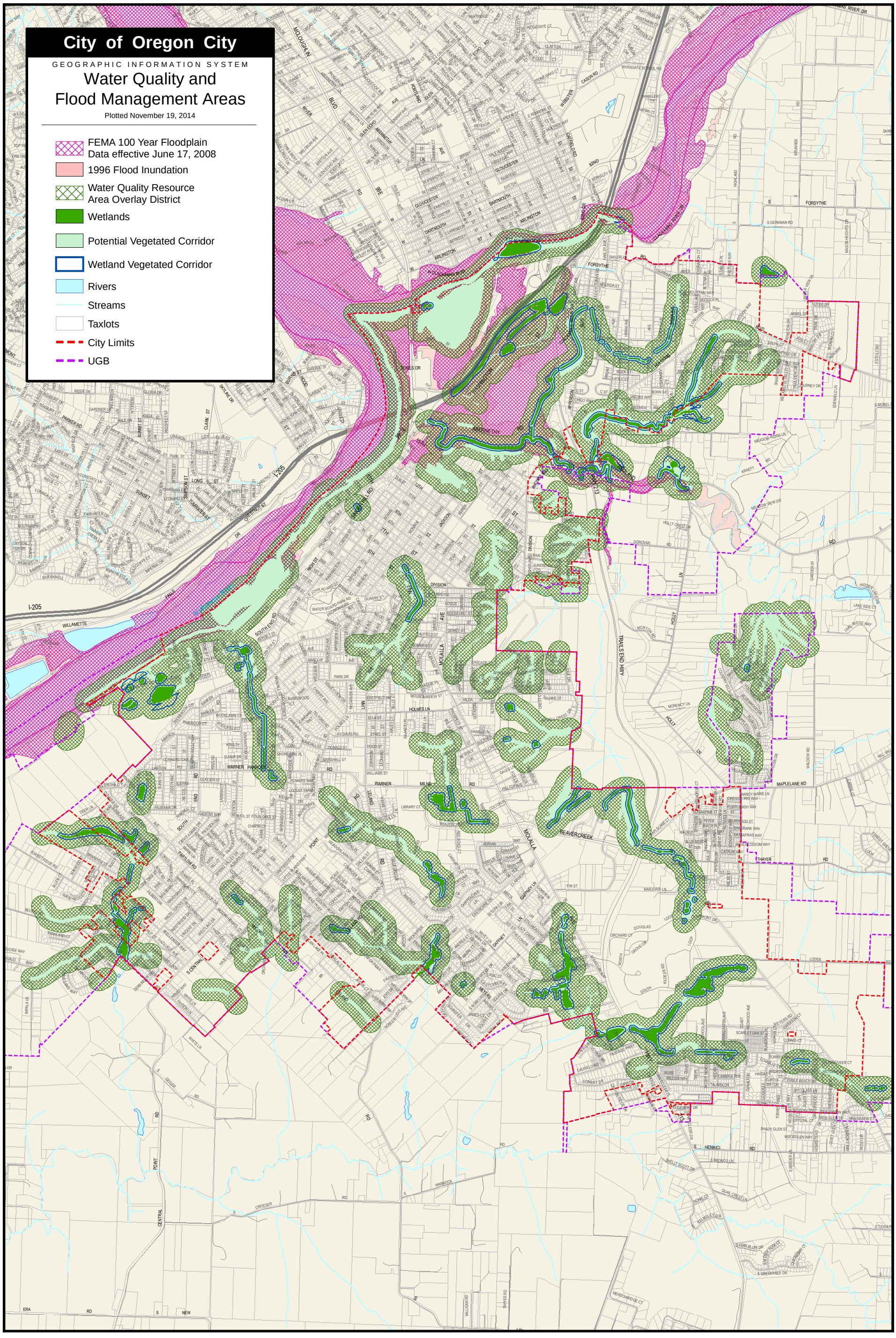
City of Oregon City

GEOGRAPHIC INFORMATION SYSTEM

Water Quality and Flood Management Areas

Plotted November 19, 2014

- FEMA 100 Year Floodplain
  Data effective June 17, 2008
- 1996 Flood Inundation
- Water Quality Resource Area Overlay District
- Wetlands
- Potential Vegetated Corridor
- Wetland Vegetated Corridor
- Rivers
- Streams
- Taxlots
- City Limits
- UGB



The City of Oregon City makes no representations, express or implied, as to the accuracy, completeness and timeliness of the information displayed. This map is not suitable for legal, engineering, or surveying purposes. Notification of any errors is appreciated.

Please recycle with colored office grade paper.

0.5 0.25 0 0.5 Miles

2,000 1,000 0 2,000 Feet

N W E S

City of Oregon City
P.O. Box 3040
625 Center St
Oregon City,
Oregon 97045
Phone: 503-657-0891
Fax: 503-657-6629
www.orcity.org

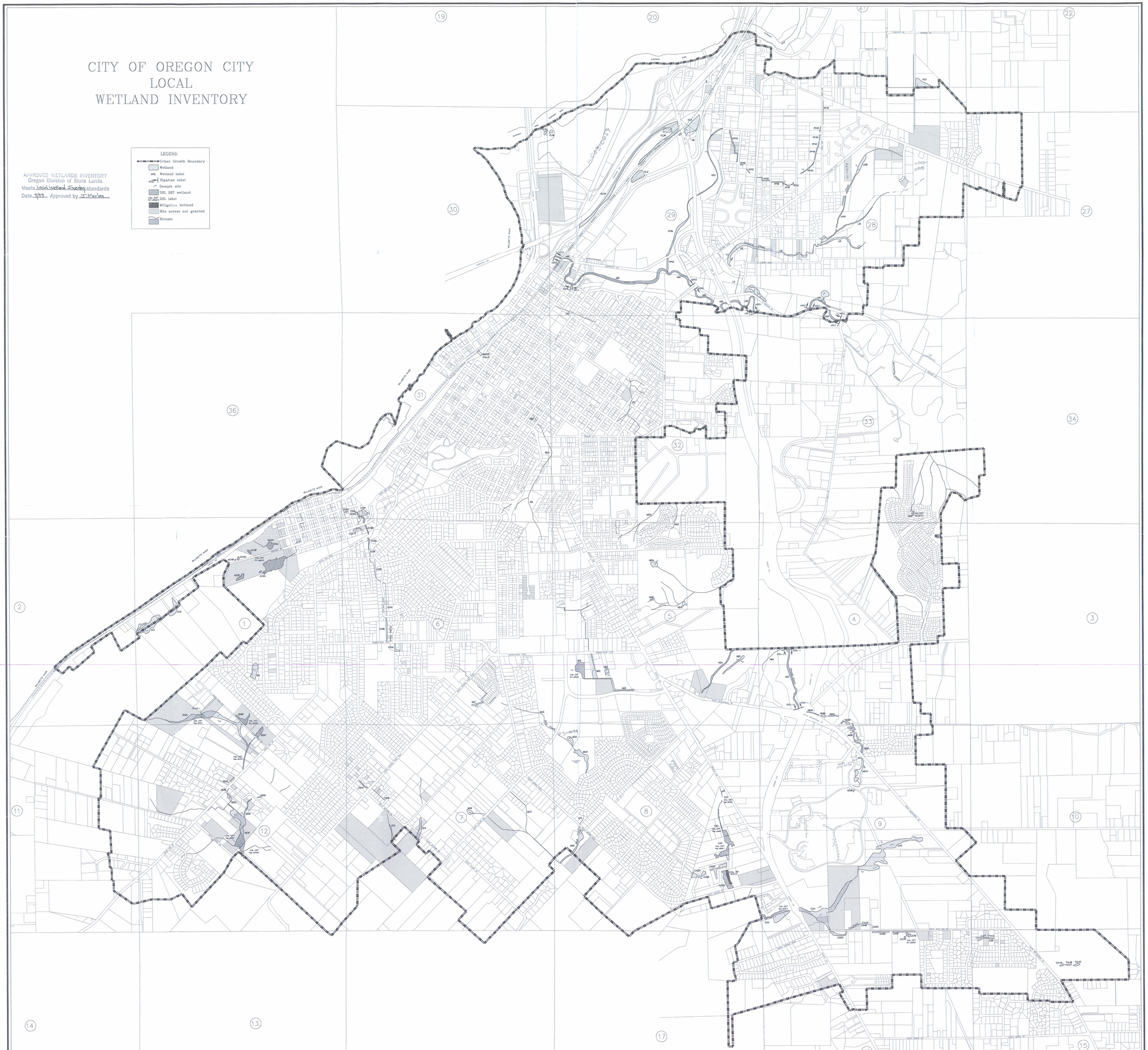
OREGON CITY

Plot date: 11/19/2014
Plot: Water Quality and Flood Management Areas - 11x17P - 20141119.pdf
Map: Water Quality and Flood Management Areas - 11x17P.mxd

CITY OF OREGON CITY
LOCAL
WETLAND INVENTORY

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets Local Wetland Inventory standards
Date 9/99 Approved by J. Morlan

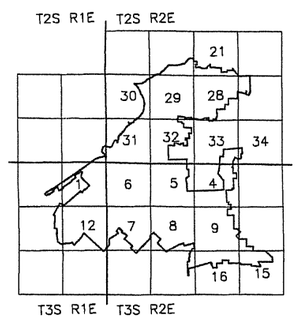
LEGEND
- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- PEM Riparian label
- Sample site
- DSL DET wetland
- DSL label
- Mitigation wetland
- Site access not granted
- Stream



APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets LWI standards
Date 9/99 Approved by J. Morlan

CITY OF OREGON CITY
LOCAL
WETLAND INVENTORY

ATTACHMENT
SECTION MAPS



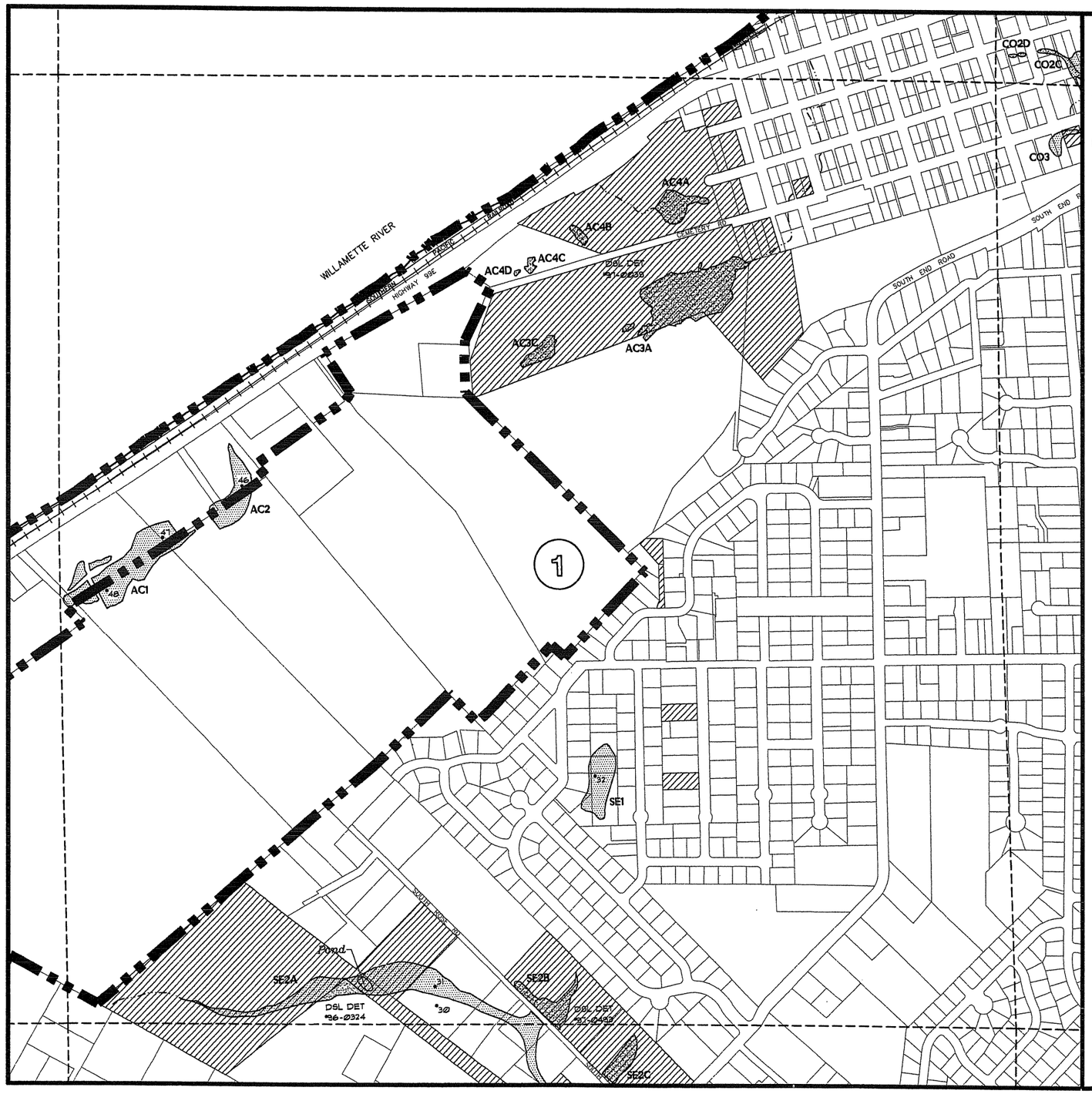
JUNE
1999

City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

PROJECT #7971165

SHAPIRO
INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets LWI standards
Date 9/99 Approved by J. Morlan

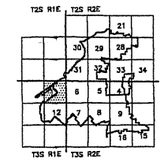


T 3S R 1E Section 01

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET 97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

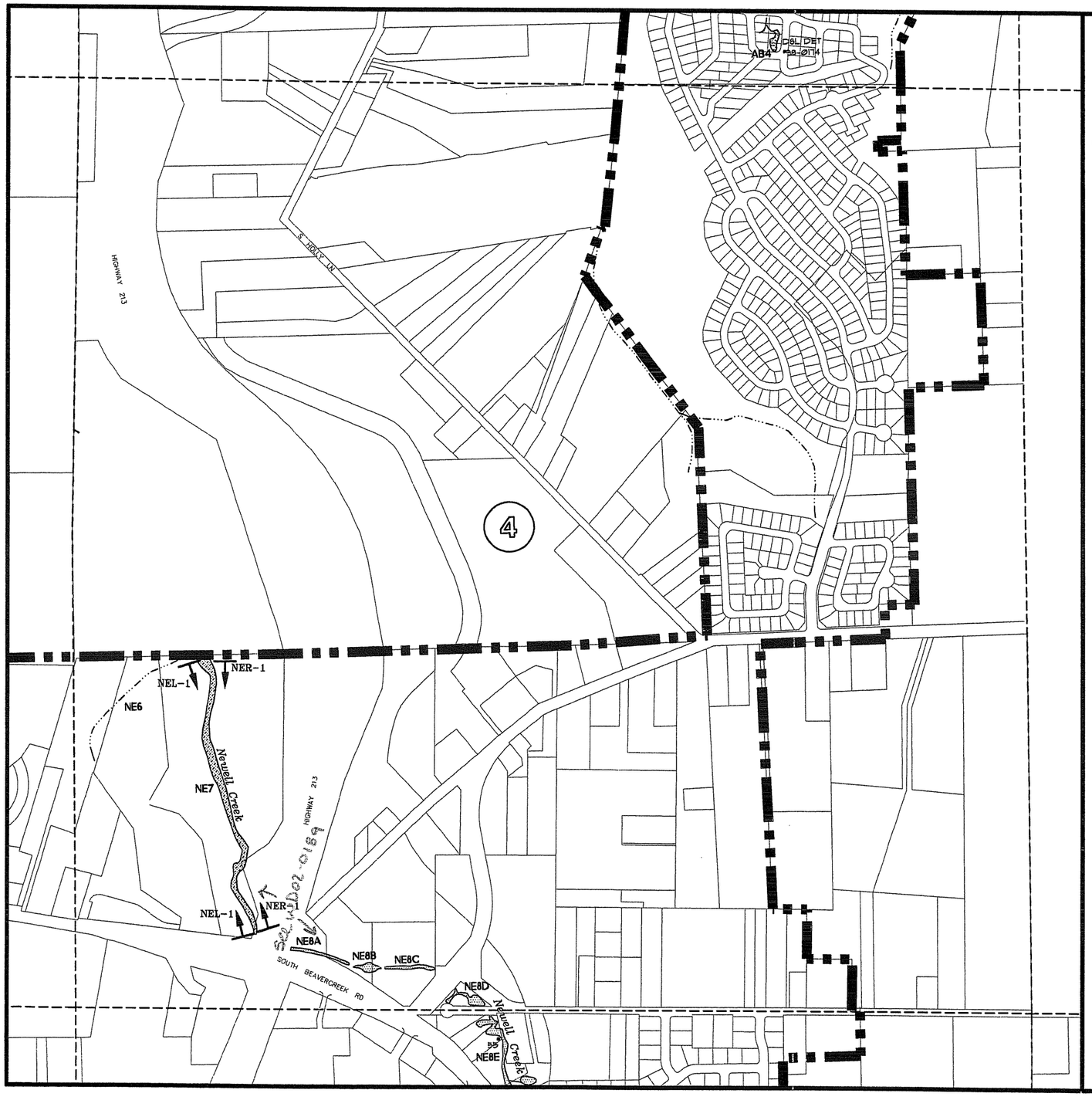
WETLAND INFORMATION IS SUBJECT TO CHANGE

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City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets L3I standards
Date 9/22 Approved by J. Morlan

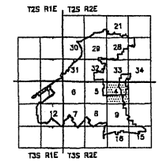


T 3S R 2E Section 04

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET #97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

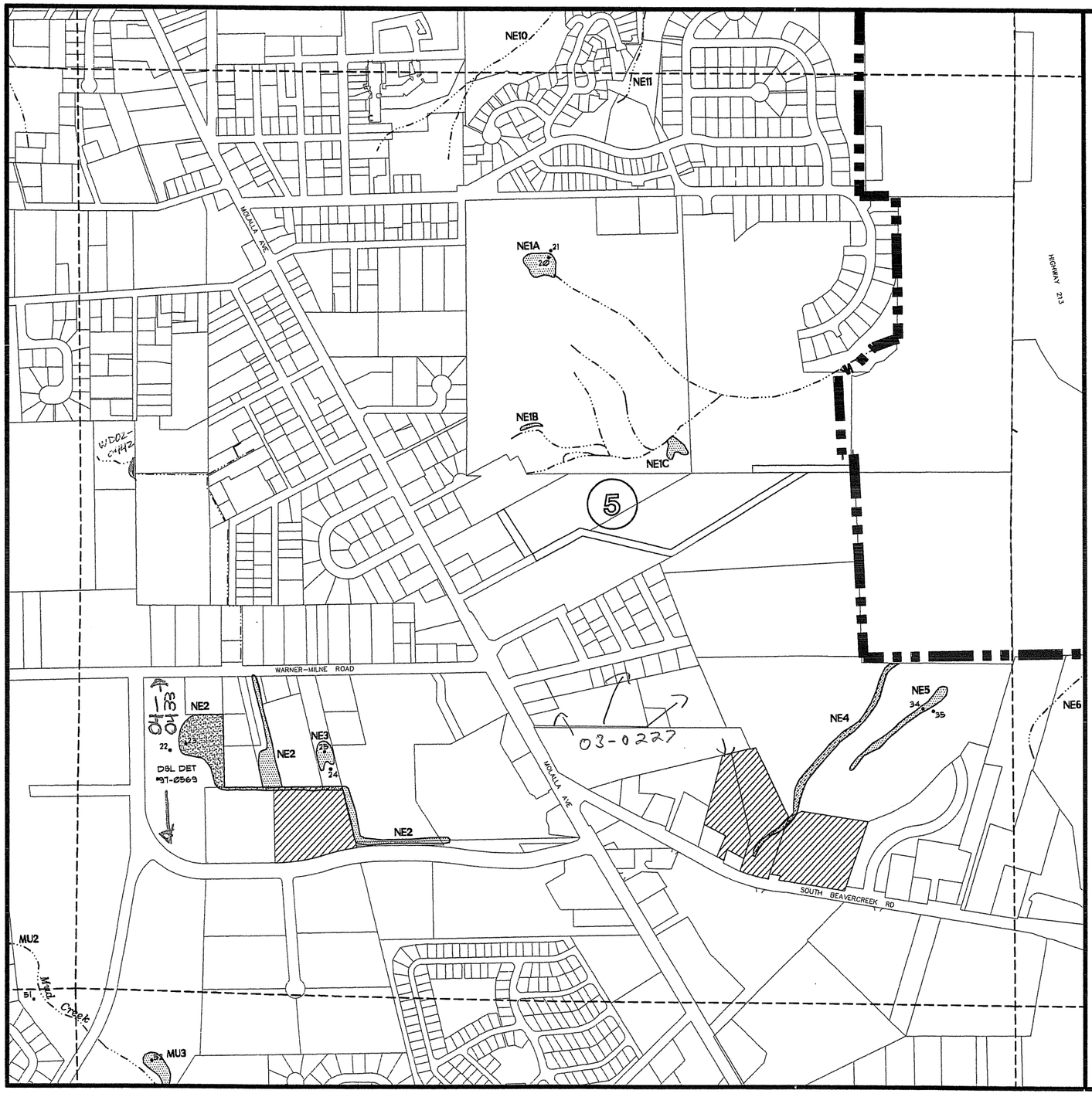
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City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets 4.3.7 standards
Date 2/99 Approved by T. Morlan

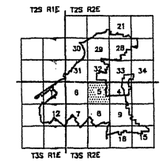


T 3S R 2E Section 05

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET #97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

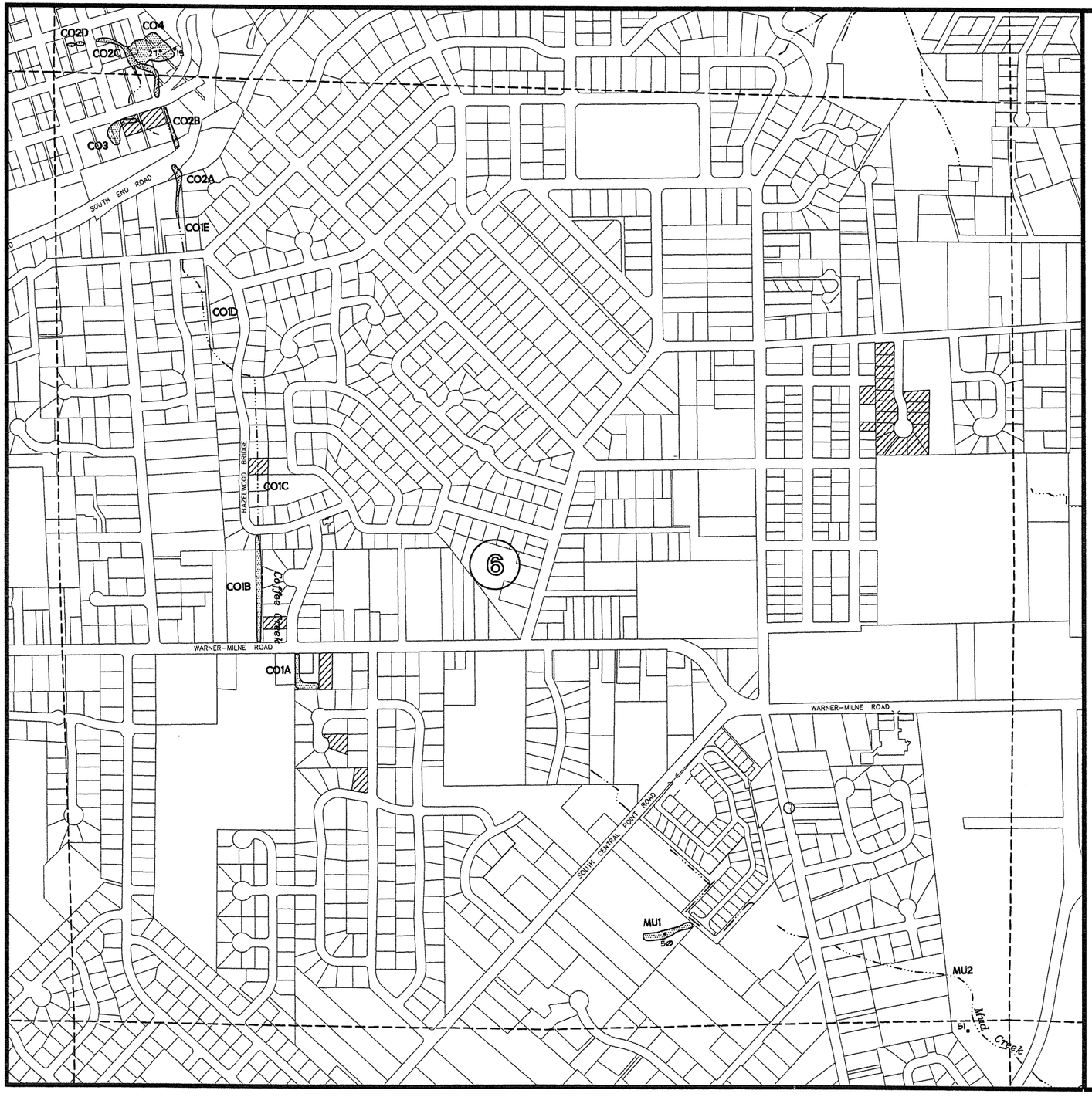
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City of Oregon City
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Oregon City, Oregon 97045

SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets L3Z standards
Date 9/99 Approved by T. Morlan

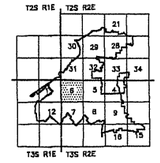


T 3S R 2E Section 06

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET #97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

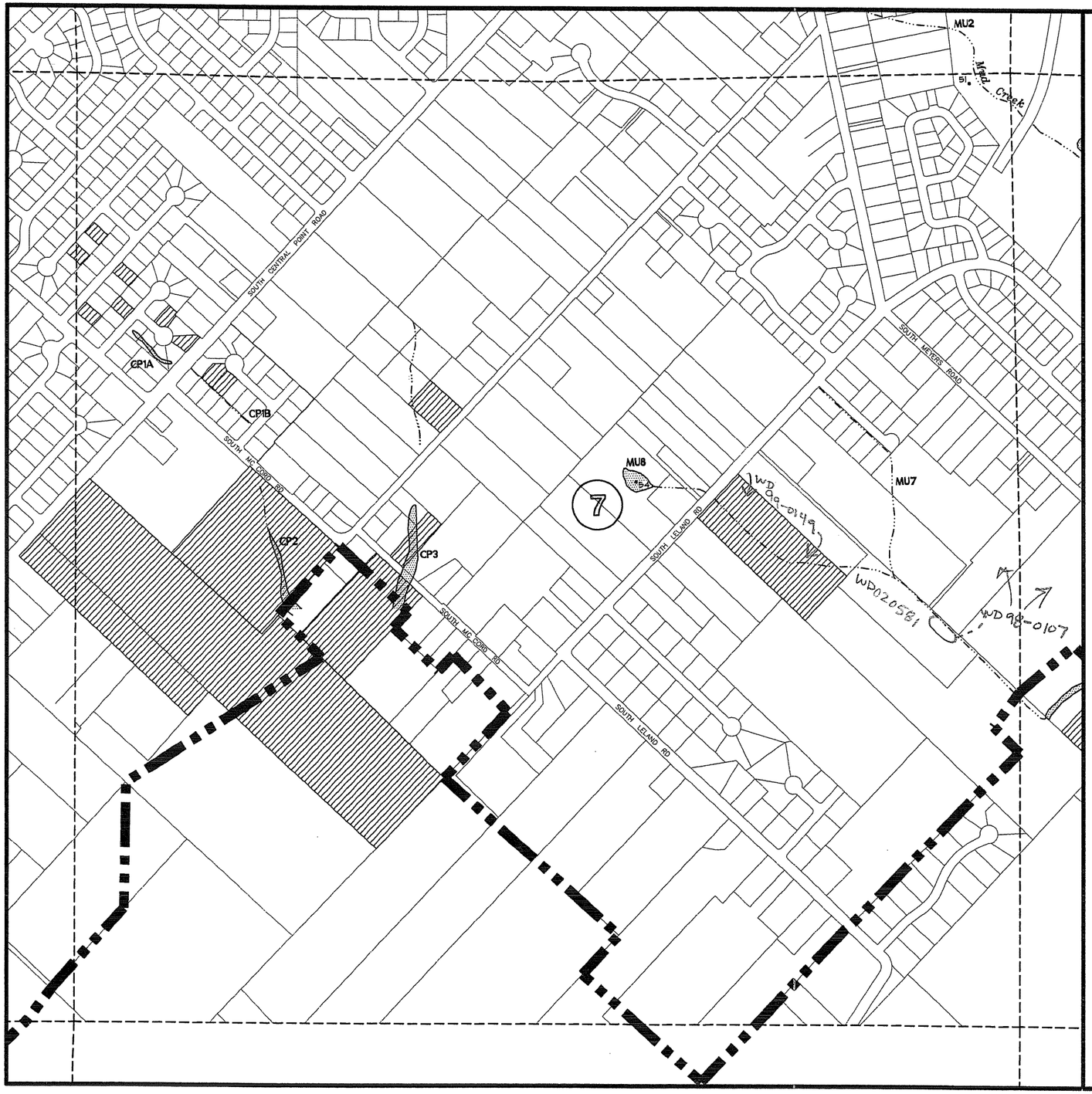
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City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets LWI standards
Date 7/99 Approved by J. Morlan

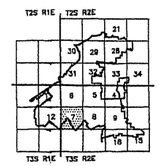


T 3S R 2E Section 07

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL #97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

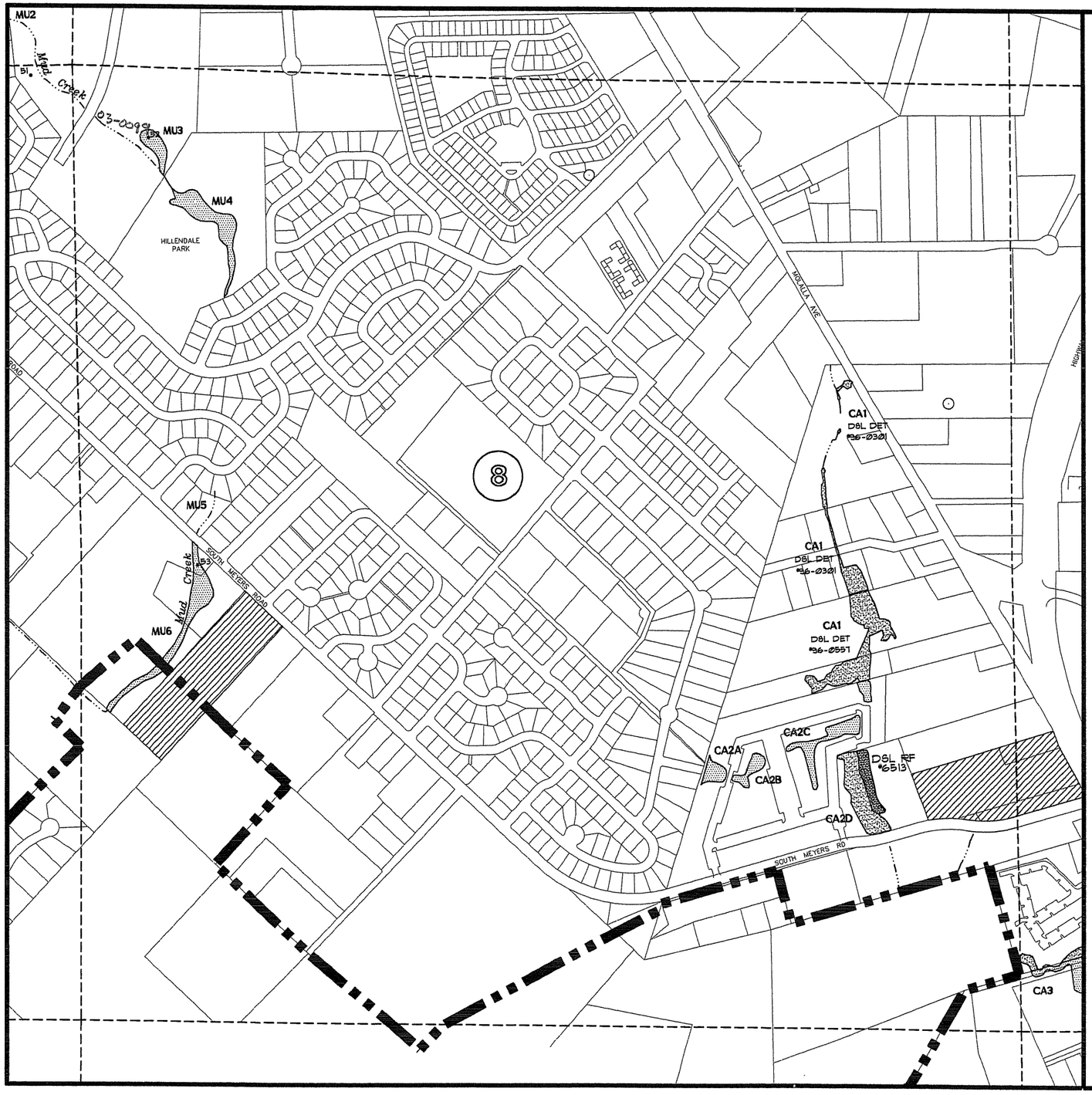
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City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets LWI standards
Date 2/22 Approved by J. Morlan

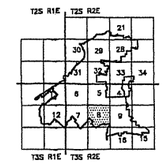


T 3S R 2E Section 08

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET #97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

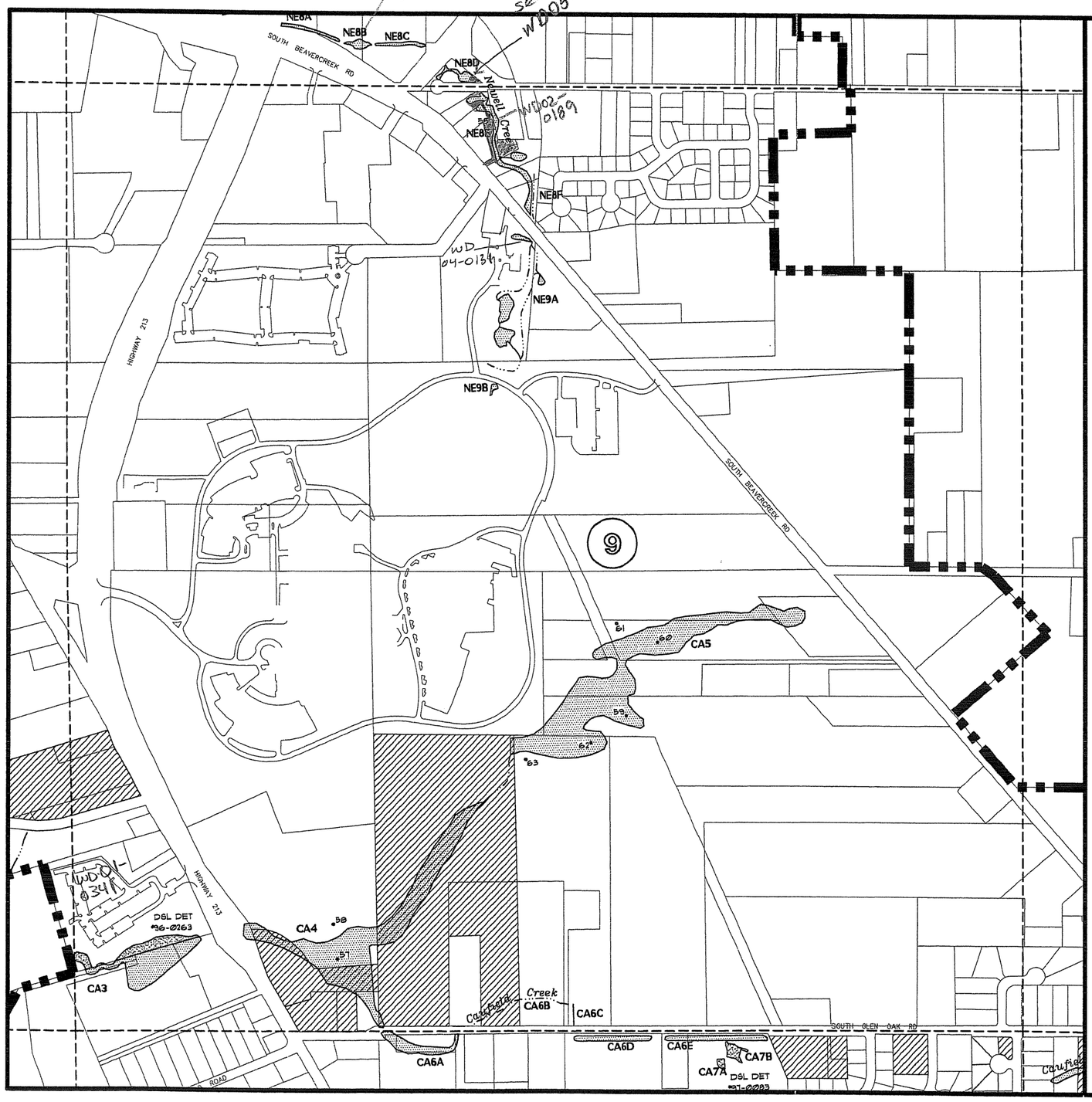
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City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets LWI standards
Date 2/11 Approved by J. Morlan

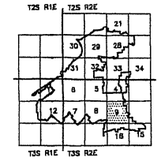


T 3S R 2E Section 09

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCRI Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET #97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

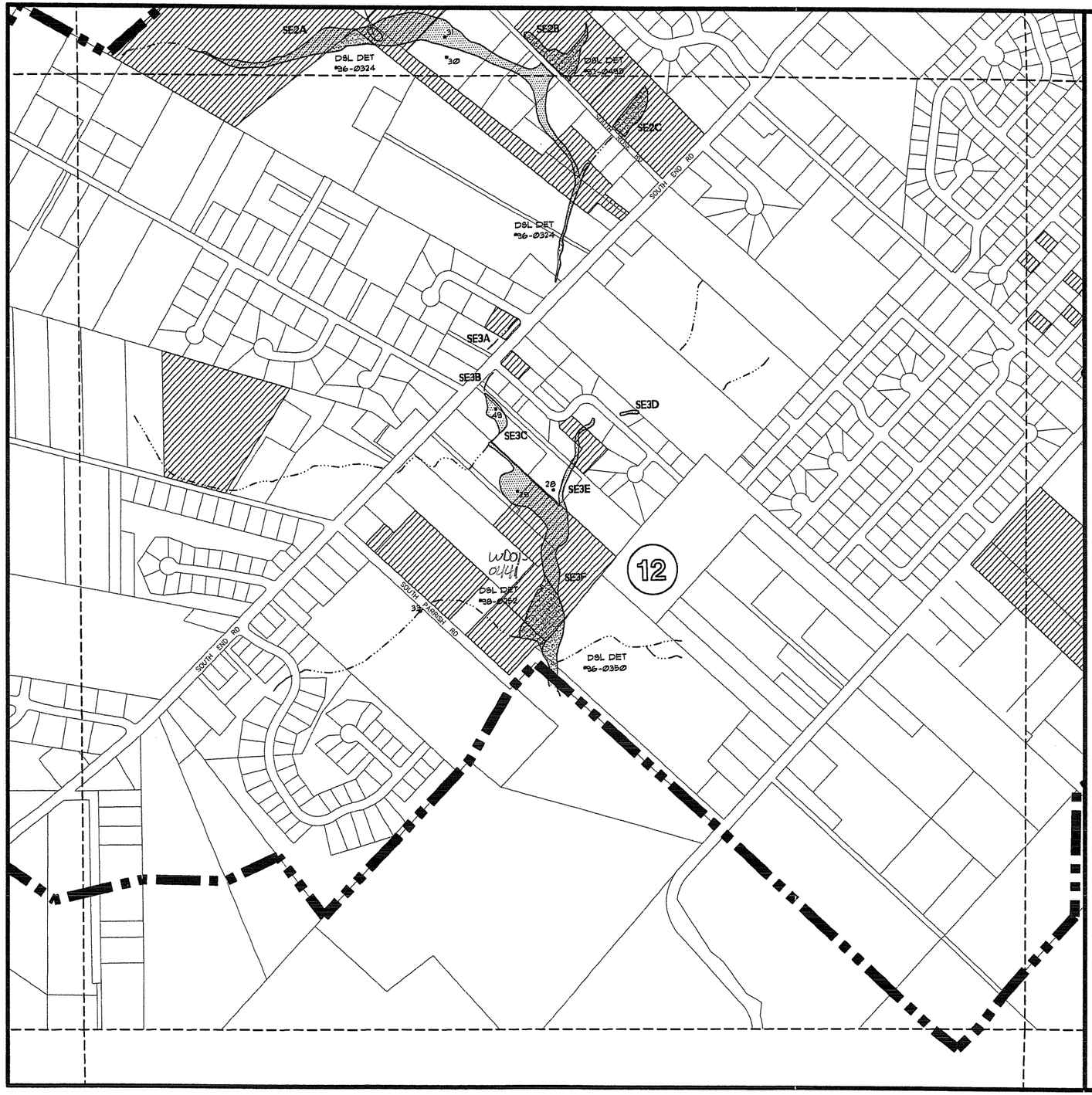
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City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets LWI standards
Date 2/99 Approved by J. Morgan

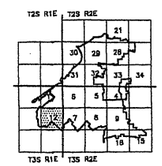


T 3S R 1E Section 12

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET #37-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

WETLAND INFORMATION IS SUBJECT TO CHANGE

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City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets LWI standards
Date 9/99 Approved by J. Morlan

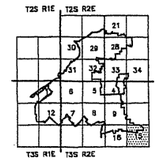


T 3S R 2E Section 15

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET 97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

WETLAND INFORMATION IS SUBJECT TO CHANGE

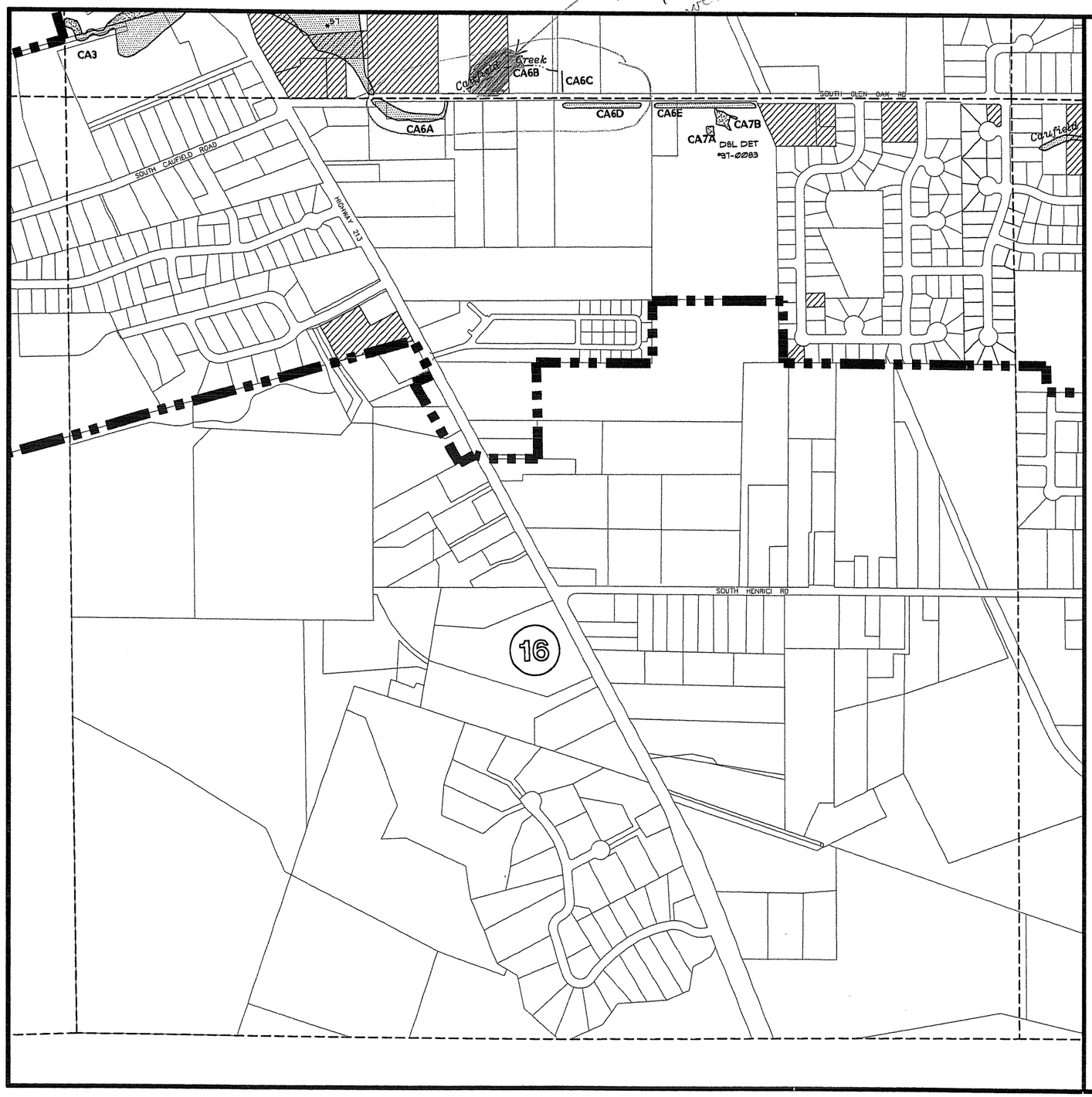
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SHAPIRO INCORPORATED

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Oregon Division of State Lands
Meets LWI standards
Date 7/99 Approved by J. Morlan

see WRO2-0531 large riparian wetland here

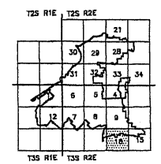


T 3S R 2E Section 16

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCRI Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET #97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

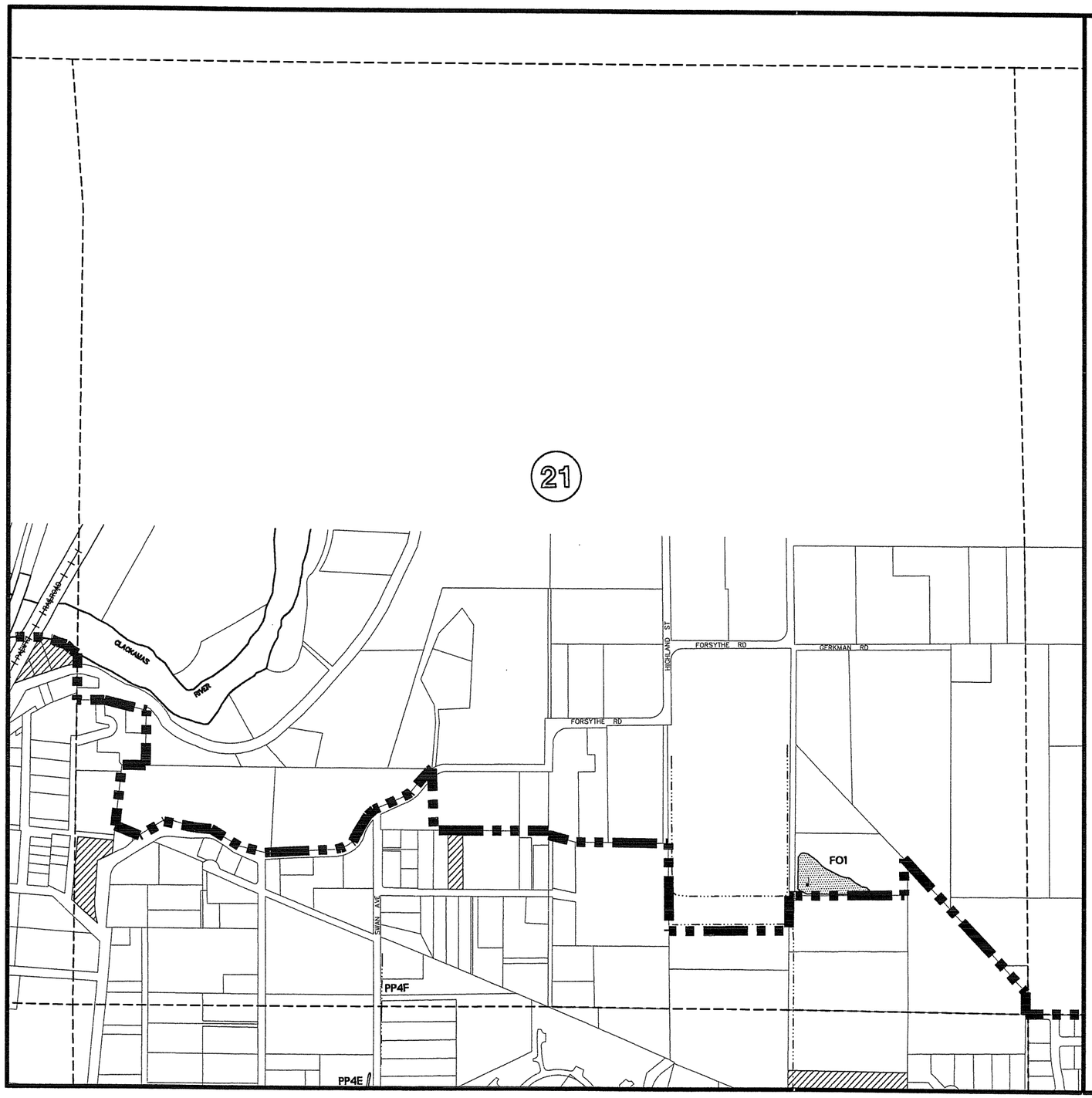
WETLAND INFORMATION IS SUBJECT TO CHANGE

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City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets LWI standards
Date 9/17 Approved by J. Morlan

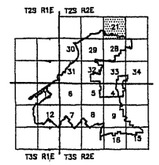


T 2S R 2E Section 21

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET 97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

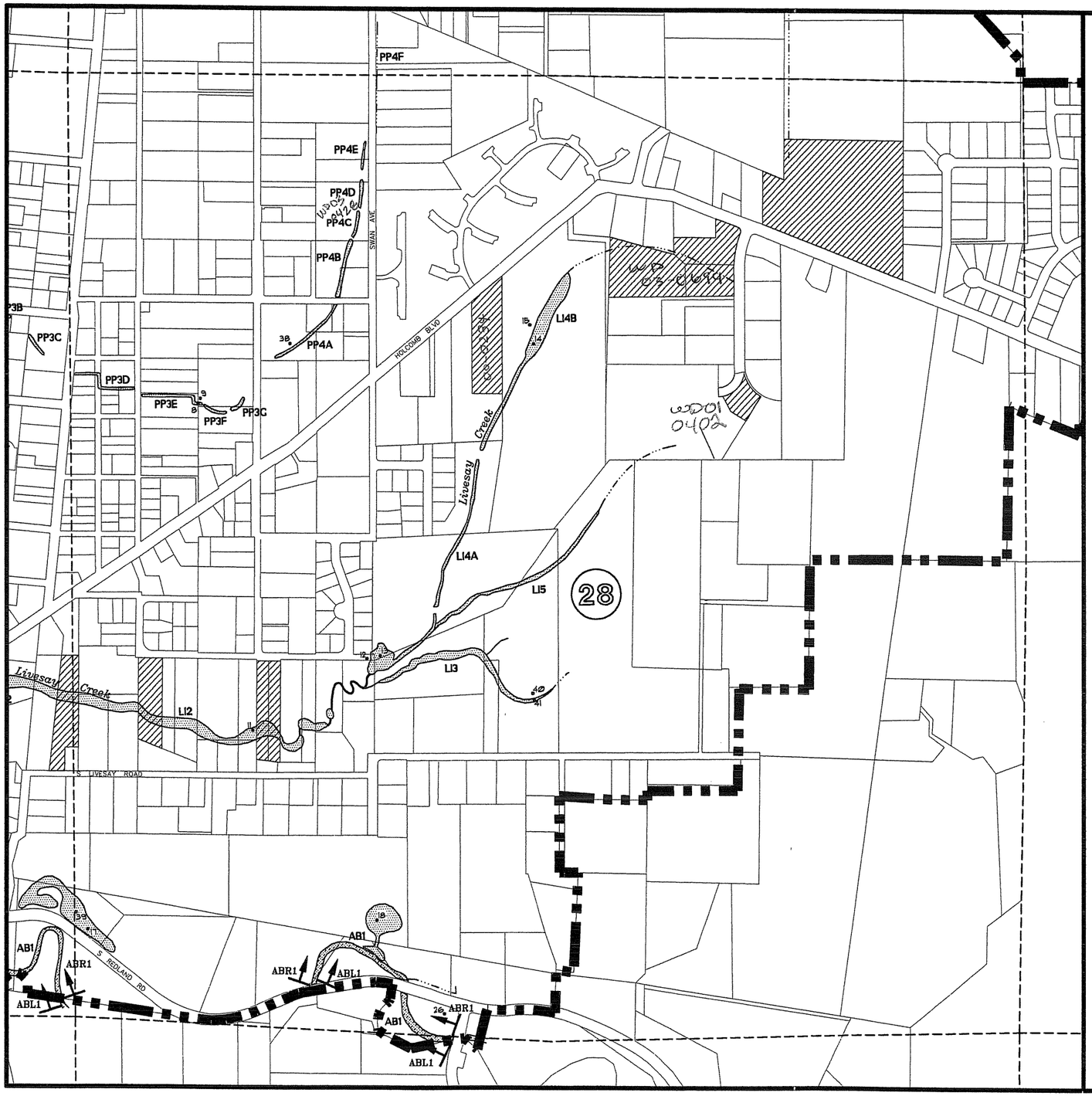
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SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
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Date 9/17 Approved by J. Morlan

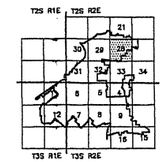


T 2S R 2E Section 28

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET #97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

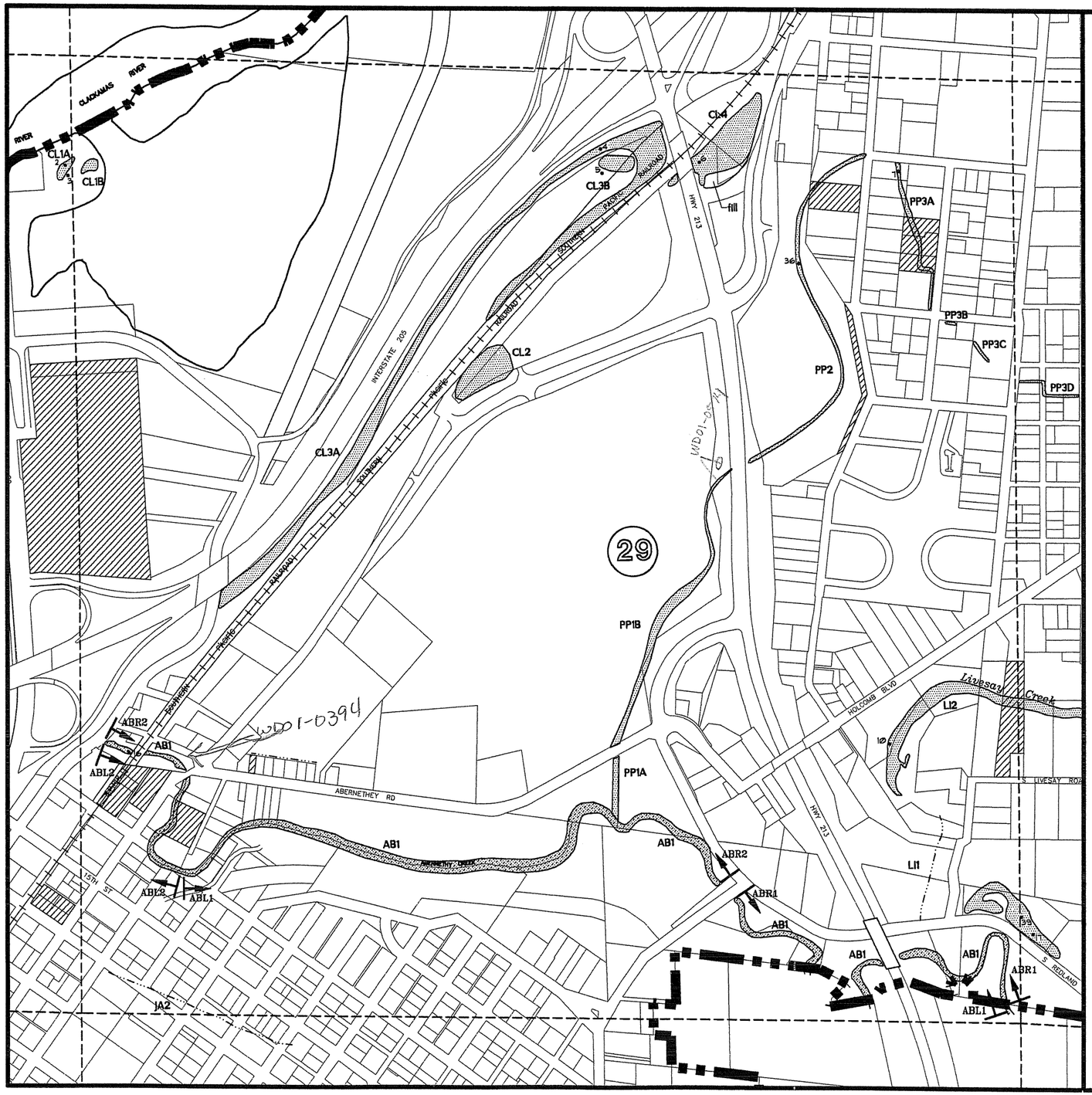
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SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
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Date 7/99 Approved by J. Morland

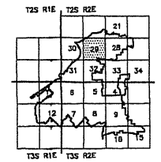


T 2S R 2E Section 29

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET #97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

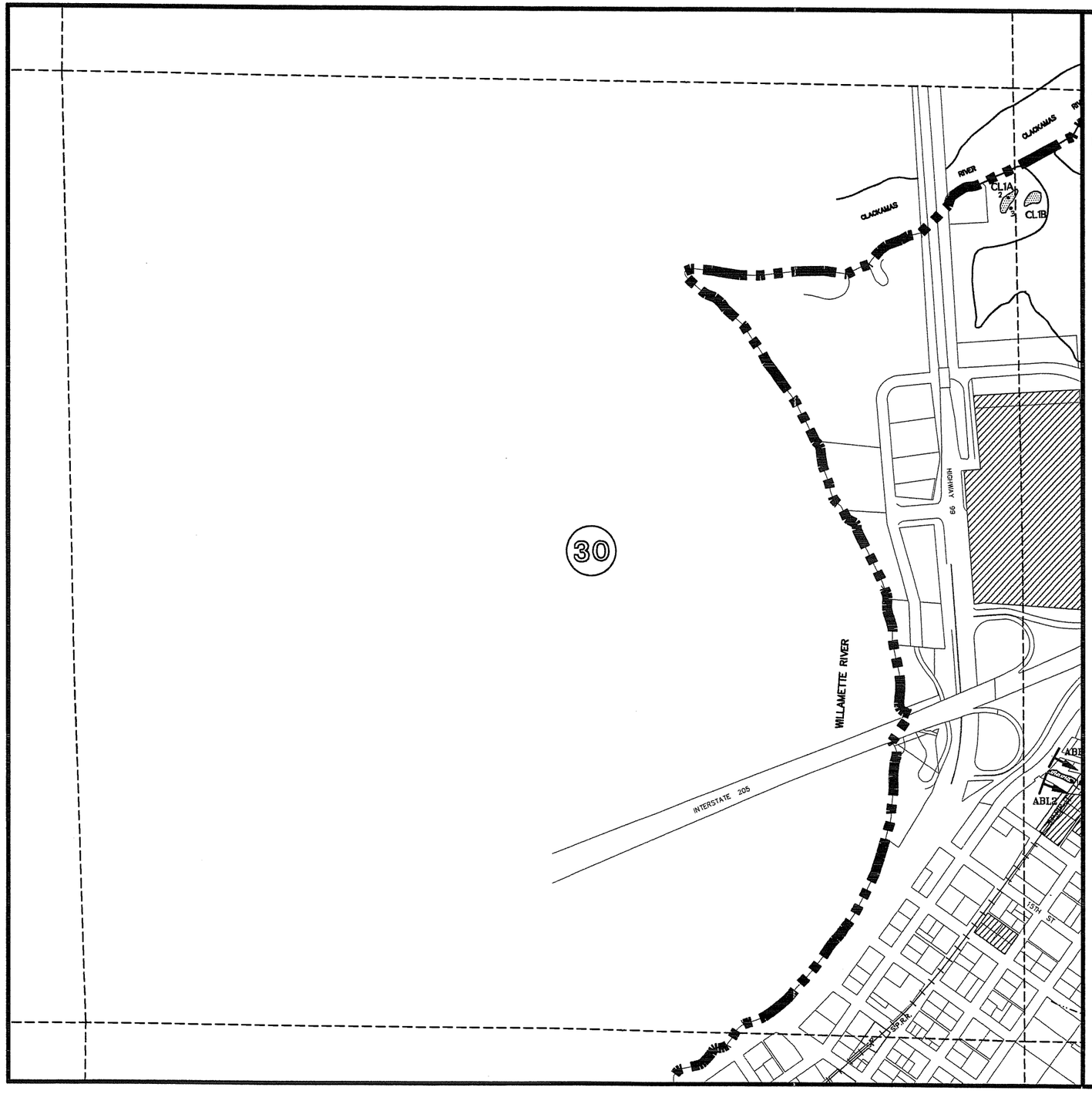
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City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets LWI standards
Date 7/99 Approved by J. Morlan

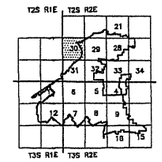


T 2S R 2E Section 30

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET 97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

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APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets LWI standards
Date 2/99 Approved by T. Morlan

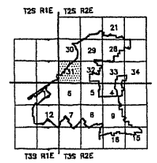


T 2S R 2E Section 31

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET #97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

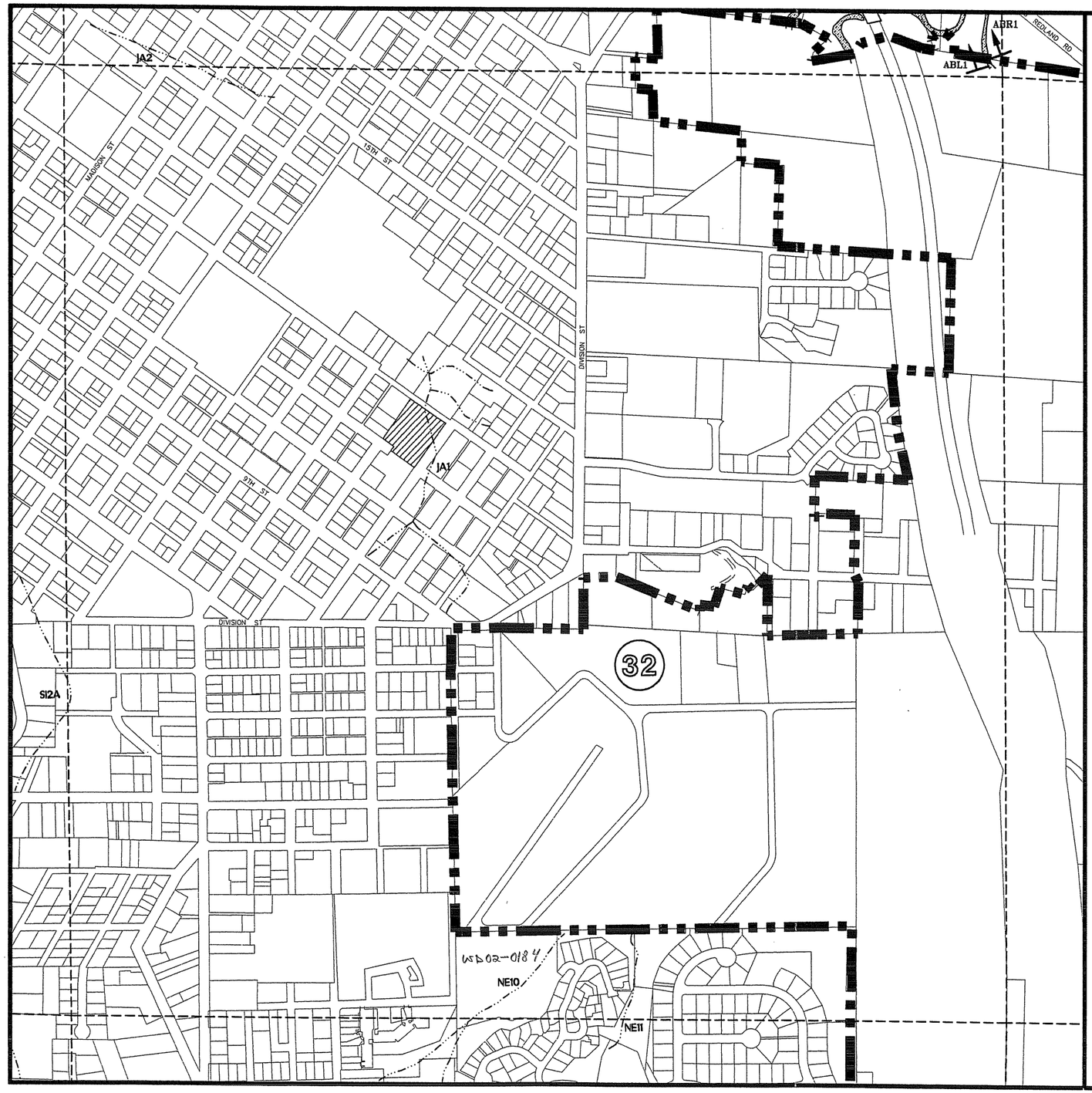
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City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets Local standards
Date 7/99 Approved by J. Morlan

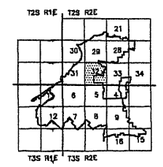


T 2S R 2E Section 32

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET #97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

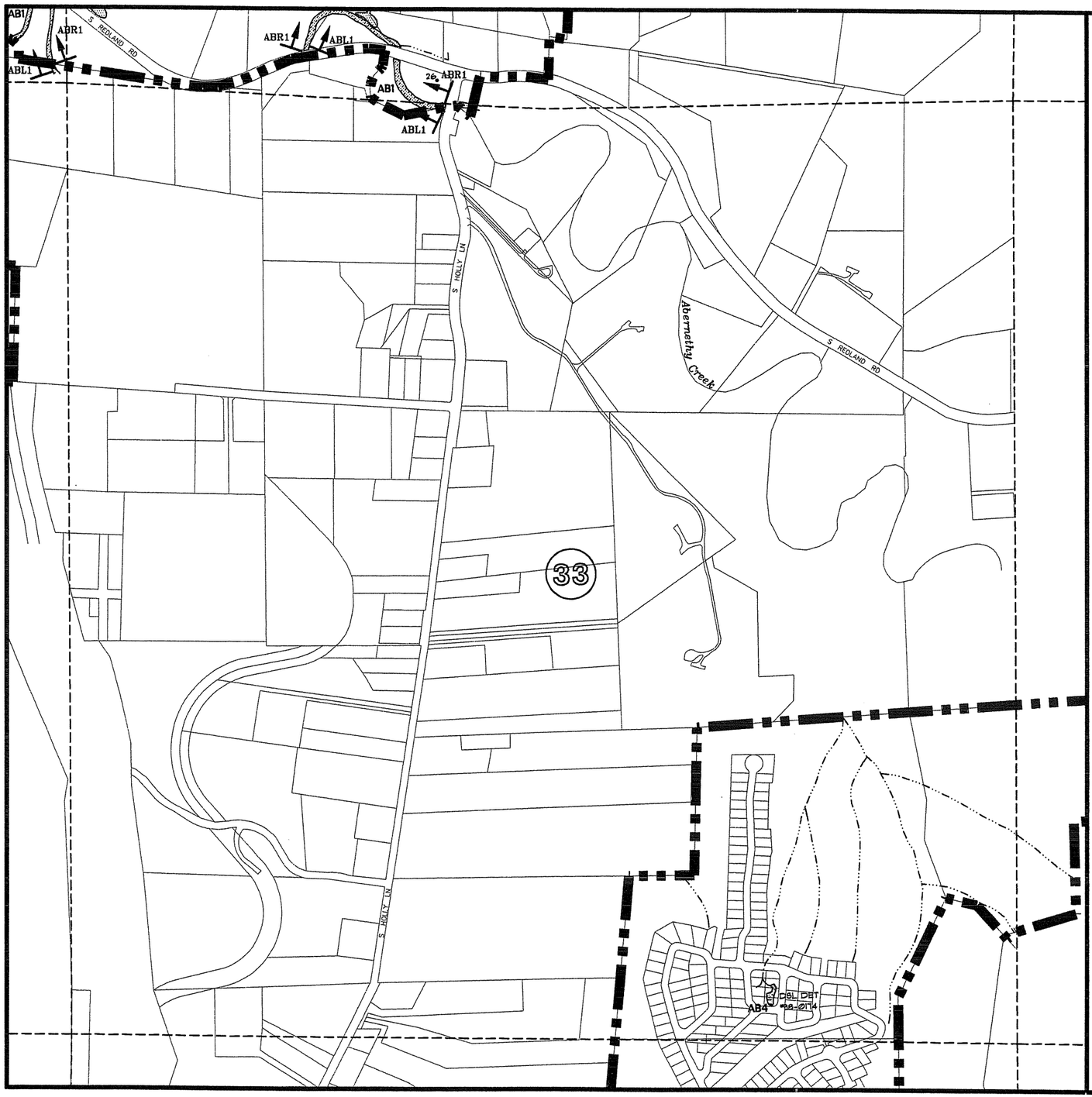
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City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

SHAPIRO INCORPORATED

APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets L33 standards
Date 3/99 Approved by J. Morlan

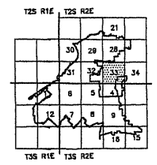


T 2S R 2E Section 33

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- 46 Sample site
- DSL DET wetland
- DSL DET #97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage

1 acre
1/2 acre
1/10th acre

NORTH

0 400 800
FEET

JUNE 1999

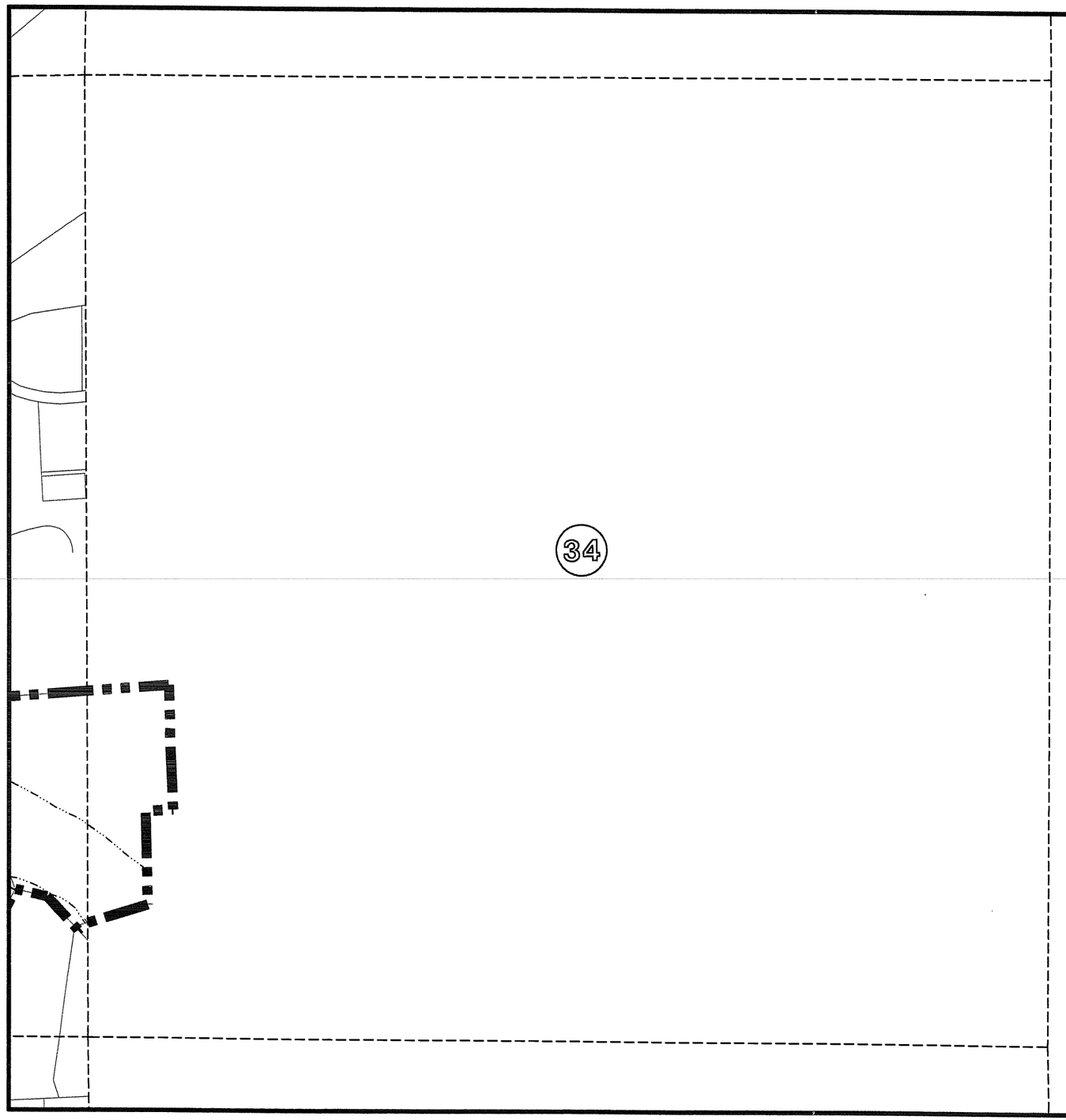
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Oregon City, Oregon 97045

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APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets L3Z standards
Date 2/99 Approved by J. Morlan

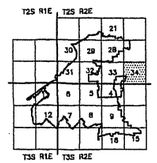


T 2S R 2E Section 34

CITY OF OREGON CITY LOCAL WETLAND INVENTORY

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET 97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream



Wetland acreage



NORTH

0 400 800
FEET

JUNE 1999

WETLAND INFORMATION IS SUBJECT TO CHANGE

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SHAPIRO INCORPORATED

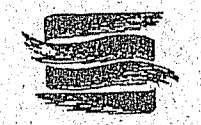
APPROVED WETLANDS INVENTORY
Oregon Division of State Lands
Meets Local Wetlands Inventory standards
Date 9/99 Approved by J. Morlan

Oregon City
Local Wetland Inventory and Riparian Assessment

Prepared for

The City of Oregon City

Prepared by



Shapiro and Associates, Inc.

June 24, 1999

Oregon City
Local Wetland Inventory and Riparian Assessment

Prepared for

The City of Oregon City
320 Warner Milne Road
Oregon City, Oregon 97045

Prepared by

Dan Cary
Colin MacLaren
Julie Fukuda
John Gordon
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Peggy O'Neill
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Shapiro and Associates, Inc.
1650 N.W. Naito Parkway, Suite 302
Portland, Oregon 97209
SHAPIRO Project #7971165

June 24, 1999

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Attachment

Wetland and Riparian Inventory Section Maps

1.0 INTRODUCTION

Oregon City (City) is recognized as the historic end of the Oregon Trail. It was the first incorporated city in Oregon. The City is the southeasternmost incorporated area within the Metropolitan Urban Growth Boundary. The City's Urban Growth Boundary (UGB) encompasses 7,127 acres (Figure 1). Like many communities in the Metro region, the City is growing at a rapid rate. The Oregon Blue Book (Levine, 1996) lists the population as 17,487.

The City has conducted periodic review of its comprehensive plan and is updating its inventory of Goal 5 resources within the UGB. A map showing an Inventory of Water Resources (the "Yellow Dot" map) was prepared by the City in 1982 (City of Oregon City, 1982). The City hired Otak, Incorporated to conduct field investigations in 1993 to complete a wetland inventory for land within the City's UGB. This inventory reviewed the City's 1982 Inventory of Water Resources sites. A draft Economic, Social, Environmental, and Energy (ESEE) analysis also was prepared. In response to the ESEE analysis, the City created a Water Resources Overlay District to implement protection of significant resources. These products were submitted to the Department of Land Conservation and Development (DLCD), which found that they did not meet the requirements set forth in *Columbia Steel Casting v. City of Portland*, 314 OR 422, 431 (1992). Neither of the previous inventories was conducted according to the Oregon Administrative Rules (OAR) for local wetland inventories (LWI). Completion of an adequate LWI will allow the City to create and implement protection strategies for natural resources.

On April 16, 1997, the DLCD awarded the City a Periodic Review Grant for Phase 1 of a LWI. The City hired Shapiro and Associates, Inc. (SHAPIRO) on April 28, 1997 to conduct field investigations of properties with potential wetland areas and produce a draft map of wetland boundaries. A set of draft maps was produced in July 1997, and a revised set of draft maps was produced in December 1997. A second Periodic Review Grant was awarded to the City in April 1998. On May 20, 1998, the City hired SHAPIRO to complete the LWI (Phase 2). An additional 130 properties were investigated, wetlands were mapped in detail, and data were collected. Functional assessments were completed for identified wetlands and riparian areas. This report and updated mapping products have been prepared to satisfy LWI requirements set forth in the OAR. An approved LWI will replace the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps that now provide information on where wetlands are located. The LWI also will be incorporated into the statewide wetland inventory.

SHAPIRO conducted the study using wetland scientists experienced in conducting LWIs: Dan Cary, Colin MacLaren, Julie Fukuda, John Gordon, and Kelly Canode. Mr. Cary is a wetland delineator certified by the U.S. Army Corps of Engineers (COE). Ed Strohmaier and Paul Gill, trained wetland delineators, and Peggy O'Neill, a wetland technician, assisted with the inventory. Sylvia Jung, a cartographer with experience mapping LWIs, produced the digitized mapping products. Field work was performed for Phase 1 between May and July 1997. Phase 2 field work was conducted between June 14 and September 16, 1998.

This report documents the methods and results of the LWI. In addition, the relative quality of the wetlands was assessed using the Oregon Freshwater Wetland Assessment Methodology (OFWAM; Roth, et al., revised edition, 1996). This information was used to identify significant wetlands within the City's UGB to address Goal 5 requirements for wetland protection. Riparian assessments were conducted using the Urban Riparian Inventory and Assessment Guide (Riparian Guide; Pacific Habitat Services, 1998). A brief description of the OFWAM and Riparian Guide processes are provided in Sections 2.3 and 2.4 of this document, and the summary sheets for each wetland are included in Appendix A and Appendix B, respectively.

Methods used to conduct the study are found in section 2.0; project area characteristics are described in section 3.0; wetland findings are reported in section 4.0; and riparian findings are reported in section 5.0. Section 6.0 includes a summary of the project, and section 7.0 lists all references used. Appendix A contains data sheets, OFWAM assessment worksheets, and results organized by watershed and wetland code; Appendix B contains riparian assessment worksheets and results; Appendix C contains a complete OFWAM guide; and Appendix D contains the Riparian Guide in its entirety. The wetland and riparian inventory section maps are attached separately to this report.

2.0 SOURCE MATERIALS AND METHODS

2.1 Source Materials

Available information and data were compiled and reviewed before field work was conducted. For example, soil mapping information was compiled from data available from the U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS, now known as the Natural Resource Conservation Service [NRCS]) county soils survey. U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles, USFWS NWI maps, flood insurance rate maps from the U.S. Department of Housing and Urban Development Federal Insurance Administration (FIRM), City zoning maps, and tax assessor maps also were consulted.

A digitized base map of the study area was obtained, which included layers for tax lot lines, street names, rights-of-way, and section boundaries. A series of recent, spring, color, aerial photographs was obtained for the study area at the scale of the base map. Other source materials included: Oregon Rivers Information System (ORIS) fish presence data base; Oregon Department of Environmental Quality (DEQ) 303(d) report (1998); Classification and Catalog of Native Wetland Plant Communities in Oregon (John Christy, 1993); 1982 City of Oregon City Inventory of Water Resources; and a current data search from the Oregon Natural Heritage Program (OHNP). This information was used to develop a preliminary indication of the location and possible quality of wetlands, facilitate on-site gathering of data, and complete the assessments.

The City, with assistance from SHAPIRO, identified properties likely to contain wetlands. The owners of the identified properties then were sent an access permission letter. Properties to which access was granted were located on the aerial photograph and later noted on inventory maps.

2.2 Local Wetlands Inventory

2.2.1 Overview of the Local Wetlands Inventory

The 1989 Oregon State Legislature authorized the DSL to develop a statewide wetlands inventory suitable for planning and regulatory purposes. Pursuant to ORS 196.674, in 1994 the DSL established LWI standards and guidelines, which are located in OAR 141-86-180 through 141-86-240. The purpose of an LWI is to locate, map, and classify wetlands by type (such as forested wetlands) over a relatively large geographic area. In accordance with LWI standards, the approximate boundaries of all wetlands at least 0.5 acre in size are identified in the inventory. No wetland boundaries were staked or flagged by SHAPIRO for this study. This LWI does include wetland delineations approved by the DSL and COE. These wetland delineations were confirmed within the last ten years, but no later than the end of the field collection period.

2.2.2 Overview of Local Wetlands Inventory Methods

A LWI is conducted using color or color infrared, aerial photographs taken within five years of the inventory initiation and at a minimum scale of 1" = 800' (1:9600). In general, wetlands are located using aerial photographs. Then site visits are conducted (on-site) option, as described in the LWI standards and guidelines. In cases in which property access is denied, wetlands can be mapped off the site using other information, such as topographic maps and aerial photographs, to aid in locating wetlands. The product of an LWI is a parcel-based map showing the approximate location of wetlands at a minimum scale of 1" = 800'. The parcel-based map allows the property owner, local jurisdiction, and DSL to know which tax lots may contain wetlands.

2.2.3 On-site Wetland Determination

Where property access permission had been granted, on-site wetland determinations were made using the *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1* (Manual; Environmental Laboratory, 1987). The COE and DSL recognize the use of the 1987 Manual for delineation of wetlands.

The Manual provides technical criteria, field indicators, and recommended procedures to be used in determining whether an area is a jurisdictional wetland, and the location of the wetland boundaries. The Manual requires that three technical criteria be met in undisturbed situations before areas can be considered wetland under federal or state jurisdiction. These criteria are the presence of hydric soils, hydrophytic vegetation, and wetland hydrology under normal circumstances. If one of these criteria cannot be determined because of disturbance caused by recent natural events or human activities, an alternative method must be used in making wetland determinations.

Observations of soils, vegetation, and hydrology were made using a modification of the Manual's "Routine Onsite" method. Data sites were selected to provide a valid representation of site conditions. Data were collected from representative sampling locations to justify the location of the wetland boundary. However, additional sample sites were investigated between these data points to verify changes in the three parameters, further characterize the wetland, and refine the wetland boundary.

Hydrologic Assessment

The Manual defines wetland hydrology as saturation within a major portion of the root zone (usually above 12 inches), typically for at least 12.5% of the growing season. The growing season for any given site or location is determined from SCS or NRCS data and information. The growing season is defined as the frost-free period recorded at the nearest recording station five years out of ten. Wetland hydrology field indicators were recorded for each excavated soil pit. Data typically recorded include depth of inundation, water table, and soil saturation. Primary indicators, such as sediment deposits, watermarks, drift lines, and drainage patterns, or secondary indicators, such as oxidized rhizospheres (root zones), also were recorded.

Soils Assessment

Hydric soils are those that have formed exclusively under wet conditions (soils that characteristically have high water tables, are ponded or frequently flooded, or are otherwise saturated for extended periods during the growing season). The possible location of hydric areas on the site was obtained from the SCS or NRCS county soil survey. Soil pits were excavated to a depth of 18 inches or more in selected locations in relation to identified potential wetland areas. Soil profiles were examined for hydric soil indicators. Soil characteristics (matrix color, mottling, texture, and other features) were recorded.

Vegetation Assessment

Hydrophytic vegetation consists of those plant species that have adapted to growing in substrates that are periodically deficient of oxygen because of saturated soil conditions. Species lists of commonly encountered plants and their status have been prepared for all regions of the country by the USFWS (1988 with 1993 supplement). The status of a particular plant is the probability of that plant occurring in a wetland. Five basic groups of vegetation are recognized in the USFWS list based on their frequency of occurrence in wetlands (Reed, 1988, 1994). These categories, referred to as the "wetland indicator status" (from the wettest to driest habitats), are as follows: obligate wetland (OBL) plants; facultative wetland (FACW) plants; facultative (FAC) plants; facultative upland (FACU) plants; and obligate upland (UPL) plants. Refer to data sheets in Appendix B for these categories. Many plants are found in transitional areas between wetlands and uplands. These areas are usually characterized by flat to gradually sloping terrain where the species composition may not reflect true wetland boundaries. In such areas, a species with a status of FACU may extend into the wetland areas, just as FACW species may be present in upland areas.

A visual percent-cover estimate of the dominant species of the plant community was performed for key sample sites. A 30-foot-radius area was investigated for dominant tree and shrub species, and a 10-foot-radius area for dominant herbaceous species, using soil pit locations as a center of reference. Dominance of plant species was determined by estimating their percent areal cover per stratum (herbaceous, shrubs, woody vines, and trees). Species from each stratum were listed together in descending order of percent cover. A determination as to predominance of hydrophytic vegetation was made using the 50-20 technique. The most abundant plant species

(when ranked in descending order of abundance and cumulatively totaled) that, when totaled, immediately exceed 50% cover, plus any species comprising more than 20% cover, represent the dominant species (Federal Interagency Committee for Wetland Delineation, 1989). If more than 50% of the dominant species included by the above criteria are FAC or wetter, the vegetation community is considered hydrophytic. FAC- species are excluded and are considered non-hydrophytic vegetation. The "-" indicates plant species that prefer slightly drier conditions on average. A "+" indicates plant species that prefer slightly wetter conditions on average.

2.2.4 Off-site Determination

No on-site sampling could be conducted where property access permission had been denied or not explicitly approved. Therefore, off-site determinations were made on the basis of aerial photograph inspection, all available mapped attributes (e.g., SCS soil surveys and NWI maps, confirmed determinations and delineations), and, where available, a reconnaissance from nearby public or approved vantage points. Observations from vantage points included documentation of dominant vegetative communities (forested, scrub/shrub, or emergent) and water regimes (such as ponded areas and obviously wet meadows). Approximate wetland boundaries were drawn on aerial photographs. Boundaries determined in this way may not be sufficiently accurate for state and federal jurisdictional determinations because of the absence of actual on-site data. In addition, where views into properties from vantage points were not possible or otherwise restricted, and where aerial photographic and mapped information was inconclusive, some wetland areas may have been missed and were not inventoried.

2.2.5 Classification of Wetlands

The Cowardin classification system was used to classify the types of wetlands inventoried (Cowardin, et al. 1979). The Cowardin system classifies wetlands according to general systems, structure, vegetation types, water regime, and other modifiers. For example, wetlands within the Oregon City study area are of the palustrine and riverine classes. Palustrine combines vegetated freshwater wetlands (traditionally called marshes, swamps, bogs, fens, and wet prairies) and small, shallow, permanent, or intermittent water bodies called ponds that are less than 2 meters (6.6 feet) deep. This classification applies to emergent, scrub/shrub, and forested wetland areas. Wetlands dominated by grasses and other herbaceous plants are classified as PEM, Palustrine Emergent. Wetlands dominated by woody species less than 30 feet high are classified as PSS, Palustrine Scrub/Shrub. A site dominated by woody species over 30 feet high is classed as PFO, Palustrine Forested. The riverine classification is composed of wetland and aquatic habitats contained within a stream channel that is not dominated by vegetation. The NWI inventory maps also use the Cowardin classification system for mapped wetland habitats.

2.2.6 Data Compilation and Interpretation

Data were recorded in the field and subsequently transferred to computerized standard wetland delineation data sheets. Sampling site locations were recorded on the aerial photographs. The approximate boundaries of wetlands and streams, and location of sample sites were drafted on the aerial photograph in the field. These boundaries subsequently were digitized onto the AutoCAD maps. All wetlands and streams received a unique code to aid in their identification.

The code was based on the drainage basin the wetland or stream was located in and their number within each basin. In general, parts of wetlands received separate codes where major roads or distinct breaks in wetland character occurred. Some wetlands were grouped and coded as one unit where they were adjacent, hydrologically linked, or similar in character, thus functioning as a unit. Wetland delineation boundaries confirmed by the DSL were digitized from photocopies of maps in reports submitted to the DSL. In addition, mitigation areas were drawn on the maps, if their locations were known.

2.2.7 Classification of Streams

Streams and drainage ditches lacking positive field indicators for wetland determination have been mapped and categorized separately from wetlands in the inventory. Typically these water resources consist of natural and modified stream channels bordered by non-wetland vegetation. These streams are often located in steeply sloped forested canyons. Excavated drainage ditches that fail to meet the criteria for wetland vegetation, soils, and hydrology have also been inventoried as streams rather than wetlands. Summary sheets describing mapped non-wetland streams, follow the wetland mapping code sequence throughout the report.

2.2.8 Confirmation of LWI

A draft set of maps and report is provided to the DSL for its confirmation and assessment. Once the DSL has reviewed the documents, SHAPIRO will review the comments and make modifications to the draft wetland maps and report. The products are then resubmitted for final approval. The status of this report as draft or final is indicated on the report cover and maps.

2.3 Wetland Quality Assessment

2.3.1 Overview of the Oregon Freshwater Wetland Assessment Methodology

The OFWAM was developed by an interagency committee to assess the relative quality of a wetland. The methodology is intended for use by planners, public officials, and community members for planning and educational purposes. Completion of this methodology provides basic information, which is not intended for evaluation of detailed, site-specific impacts on individual wetlands.

OFWAM is based on the idea that an understanding of the wetland system functions and conditions at local, state, and federal levels is necessary to make management decisions. Recommended uses of OFWAM include collection of basic information about wetlands in an assessment area, creation of a database of functions and conditions and other wetland data, support of decision making and planning within a jurisdiction, and education. OFWAM requires that the same functions and conditions be evaluated for each wetland within a study area. There are, in addition, other considerations noted in the following sections that determine the wetland's overall value.

2.3.2 Application of OFWAM

OFWAM assessments were partially completed during field work using data gathered in the field. Other source materials were used to complete the assessments. The methodology provides qualitative information on the relative value of wetlands based on a series of questions related to wetland functions. The following functions are assessed: wildlife habitat, fish habitat, water quality, hydrologic control, sensitivity to impact, enhancement potential, education, recreation, and aesthetic quality. Each function is assessed by criteria that give an indication of whether a wetland function is (1) intact, (2) affected or degraded, or (3) lost or not present. OFWAM is designed to be open-ended; therefore, other functions and conditions may be added later, or some may be dropped if not important to the user.

The OFWAM results and a summary of the functions and conditions for each wetland are included in Appendix B. Additional details about assessing the functions and conditions are provided in Appendix D.

2.3.3 Wetlands of Special Interest for Protection

A subset of questions within OFWAM provides a method to assess whether any wetlands within the study area should be considered Wetlands of Special Interest for Protection (WSIP). WSIP assesses whether the wetland is currently in a management plan, is protected by regulatory rules or statutes, or is uncommon in Oregon. The presence of rare, threatened, or sensitive species within an area makes the wetland a potential WSIP. An affirmative answer to any one of these questions also will place the wetland into a category for protection. This information could be used in management decisions for a site. The use of OFWAM and WSIP screening questions will assist in an overall evaluation of the wetlands in the assessment area. Many of these WSIP questions are repeated in the locally significant criteria questionnaire (see next section), so the results were combined in one table (see Section 4.3).

2.3.4 Locally Significant Wetland Assessment

The term "significant wetlands" has meaning in the context of Statewide Planning Goal 5. Under this Goal, local governments are instructed to identify their significant resources, including wetlands, so those resources serving significant functions in the local community are given proper consideration in planning decisions. The DSL established a technical advisory committee to develop the locally significant wetlands (LSW) criteria. The DSL adopted the Administrative Rules for Identifying Significant Wetlands in January 1997 (141-86-300 through 141-86-350). The criteria rely heavily on the results of OFWAM. Only jurisdictional wetlands are assessed with the criteria.

Locally Significant Wetland Criteria:

A wetland is considered significant if it meets one or more of the following criteria:

- Wetlands that are given the highest rank for any of the four ecological functions addressed by OFWAM or equivalent methodology (see Appendix D for more details on the ranking):

- wildlife habitat,
- fish habitat,
- water quality, or
- hydrologic control.

- Wetlands that (1) are rated either in the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality limited stream, as listed by the DEQ. Dedicated stormwater detention swales are not included.

- Wetlands that contain one or more uncommon wetland plant community, including those listed in the OHNP's *Classification and Catalog of Native Wetland Plant Communities in Oregon* as G1-G3 and S1-S3.

- Wetlands inhabited by any species listed by the federal or state government as a sensitive, threatened, or endangered in Oregon (unless consultation with an appropriate agency deems the site not important for the maintenance of the species).

- A wetland that is a dedicated or proposed Registered Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

- Wetlands specifically protected as wetland resources in a recognized federal, state, or local management plan, (e.g., for park, refuge, or scenic river).

- Wetlands that rate in the highest category for fish habitat in OFWAM and are located adjacent to a stream segment that is mapped by the Oregon Department of Fish and Wildlife (ODFW) as habitat for "indigenous anadromous salmonids."

The final two criteria are at the discretion of the local government, but have direct connections to OFWAM results:

- *Optional Criterion* (at discretion of local government): The wetland represents a *locally* unique plant community. Wetland is or contains the only representative within the UGB of a particular native plant community (listed in the OHNP's *Classification and Catalog of Native Wetland Plant Communities in Oregon)*. To be identified as a LSW, such a wetland also must score the highest or second highest rank for any of the four ecological functions addressed by OFWAM or equivalent methodology.

- *Optional Criterion* (at discretion of local government): The wetland rates at the highest rank for education potential, and there is documented use for educational purposes by a school or organization.

The City will be required to prepare local wetland protection ordinances to apply to locally significant wetlands. Additional wetlands may be protected based on other information, such as the results of the WSIP. Any wetlands not protected by local ordinances may still be under the jurisdiction of DSL and COE.

2.4 Riparian Assessment

2.4.1 Overview of Riparian Assessment

In accordance with Goal 5, a riparian inventory and assessment was performed for limited areas within Oregon City's UGB. Goal 5 requires local governments to inventory and protect riparian corridors. Riparian areas are zones of transition between aquatic ecosystems and terrestrial ecosystems. Goal 5 includes definitions that establish a riparian area adjacent to every river, lake, or stream, including intermittent streams with a defined channel. Human-made irrigation or drainage ditches are specifically excluded. Riparian areas can enhance water quality, reduce erosion, moderate water temperatures and flood flows, and provide important fish and wildlife habitat. Riparian areas are particularly important for anadromous salmonids, which rely on cold, clean water and the habitat created by large woody debris.

Local governments have two options that can be implemented in the protection of riparian areas. One option is to inventory and assess all riparian areas as described above, establishing the width of the riparian corridor on the basis of riparian vegetation. The inventoried sites are then analyzed to determine their significance, and ordinances are implemented to provide appropriate protection.

The other option is to implement the "safe harbors" provision. Under this plan, only riparian areas adjacent to fish-bearing water resources are included for protection, and their width is based on the average stream flow of the water resource. Local governments may use either of these options, or some combination of them, to manage their riparian resources.

The riparian inventory and assessment was conducted using the methods contained in the Riparian Guide (a copy of which is found in Appendix E). The Riparian Guide is a rapid inventory and assessment method for defining the location and quality of riparian areas. It is intended as a tool to provide consistent riparian inventory results. This document provides guidance for determining the width and length of riparian areas, and for assessing their water quality, flood management, thermal regulation, and wildlife habitat functions

2.4.2 Methodology of the Riparian Guide

The Riparian Guide includes a field inventory component, during which information is gathered on the width and other physical characteristics of the riparian areas. Riparian areas are assessed as left and right reaches facing downstream. Reaches of the riparian area are split where the character of the riparian area changes. The potential tree height (PTH) of the dominant tree species in the riparian area determines the width of the riparian areas assessed. Based on these field observations, the following functions of the riparian area are assessed: (1) Water quality, (2) Flood Management, (3) Thermal Regulation, and (4) Wildlife Habitat.

In general, a riparian area receives a higher ranking when the following criteria are met:

- average slope in the riparian area is less than 10%;
- dominant vegetation cover in the riparian area is woody vegetation (trees, shrubs, vines) greater than 1 meter (3.2 feet) high;
- dominant vegetation at the top of the bank or edge of the water resource is woody vegetation greater than 1 meter (3.2 feet) high;
- extent of impervious surface is less than 10%;
- the NRCS ranks the water erosion hazard of the dominant soil unit as low, slight, or moderate;
- aspect or orientation of the riparian area allows shading of the water resource at midday during the summer;
- flood prone areas (adjacent flat areas, depressions, swales, FEMA mapped 100-year floodplain) are present beyond the top of the bank or edge of the water resource;
- woody vegetation (trees, shrubs, vines) greater than 1 meter (3.2 feet) high are dominant in the flood prone area;
- large woody debris is present within the riparian area;
- stream or water resource is not constricted by human-made features (e.g., channelization, riprap, concrete wall, etc.);
- water resource is bordered by a vegetated riparian area at least 30 feet wide;
- more than two vegetation layers are present (e.g., canopy, mid-story, groundcover)
- woody vegetation overhangs the edge of the water;
- surface water is present throughout year;
- more than one type of water resource (stream, wetland, lake/pond) is within or immediately adjacent to the riparian reach;
- degree of development or human-caused disturbance (e.g., buildings, impervious surfaces, lawns, agriculture, trash) in the riparian area is less than 25%.

Where these factors are present or developing, the riparian area provides for water quality, flood management, thermal regulation of the water resource, and wildlife habitat.

2.5 Cartographic Products

Wetland boundaries were drawn on aerial photographs. Aerial photographs can have distortion at the edges, so digitized boundaries were adjusted. The inventory was mapped at a scale larger than the scale required in the LWI rules to allow for more clarity. However, at the map scale of 1" = 600' (1:4800), the width of a wetland boundary line is approximately 6 feet. Wetland field staff reviewed early draft maps and made corrections where necessary to increase the accuracy of the maps. Sample sites were identified within properties to which access was permitted. Ditches and other narrow linear features located on the edge of a property were occasionally drawn slightly to the side of the property line for graphic clarity. Each section map includes a small portion of the adjoining sections. The overlap allows for ease in viewing a wetland that may cross section boundaries. Using AutoCAD, a line was drawn paralleling the edge of the stream to show the width of the potential riparian area.

3.0 PROJECT AREA CHARACTERISTICS

3.1 Background Information

Available information and data were compiled and reviewed before field work was conducted. Soil mapping information was compiled from data available in the SCS Soil Survey of Clackamas County Area, Oregon. Preliminary wetland information was obtained from Canby, Gladstone, and Oregon City, Oregon NWI maps. Local knowledge about water resources was incorporated into the study by giving reference to the Inventory of Water Resources (the "Yellow Dot" map) prepared by the City in 1982. Floodplain information was obtained from Oregon City and Clackamas County FEMA-FIRM 100-year floodplain maps (U.S. Dept. of Housing and Urban Development, 1979). Also consulted were the Canby, Gladstone, and Oregon City, Oregon USGS 7.5-minute topographic quadrangles; detailed topography maps from the City of Oregon City (1997, 1"= 400', 2-foot contours); Oregon City's Surface Water Management basin map (1997); and City zoning maps. Other source materials included: the Oregon Rivers Information System (ORIS; Baker and Forsberg, 1994) fish presence data base; Oregon's 1998 Section 303(d) List of Water Quality Limited Waterbodies (Oregon Department of Environmental Quality [DEQ], 1998); *Classification and Catalog of Native Wetland Plant Communities in Oregon* (Christy, 1993); and a current data search from the ONHP. This information was used to develop a preliminary indication of the location of wetlands, identify drainageways, highlight low-lying areas, facilitate on-site gathering of data, and complete the assessments.

Oregon City provided a digitized base map of the study area. This map included layers for tax lot lines, street names, right-of-ways, and section boundaries. The project area base map was then plotted at a scale of 1" = 400' onto 18 18" x 24" sheets. Each sheet covers a section and small portions of surrounding sections, and includes an index map.

Five color, aerial photographs dated June 16, 1996 were obtained from Northern Light Studio, Inc. for the study area (approximately 24" x 36") at an approximate scale of 1" = 400' to match the scale of the base map. These aerial photographs were covered with clear acetate (permanently registered) to protect them during field use and as a surface for drafting wetland boundaries and sample sites.

The City, with assistance from SHAPIRO, identified properties likely to contain wetlands. The owners of the identified properties were sent an access permission letter. The boundaries of properties to which access was granted were identified on the aerial photograph and base map.

3.2 Setting

The City of Oregon City is located on the eastern edge of the Willamette Valley at the base of the Cascade Range foothills in Clackamas County, Oregon (Figure 2). The confluence of the Clackamas River with the Willamette River is at the northwestern corner of the City. These rivers form the City's western and northern boundaries. The main ground transportation corridors are

Interstate 205 across the northern portion of the City; State Highway 99 East along the bank of the Willamette River, Highway 213 extending south, and Redland Road, which heads east from the City.

The boundary of the wetland inventory area corresponds with the City's UGB (Figures 1 and 2). Starting in the northern portion of the City where the I-205 bridge crosses over the Clackamas River, the UGB heads east, then south to the vicinity of Stolz and Holcomb Roads. It then turns southwest to Anchor Way and Division Street, then south toward Beavercreek Road. North of Beavercreek Road, the UGB turns east, with a northern extension to include the Country Village development. It then turns south to Beavercreek Road and Timbersky Road, the southeastern corner of the UGB. The boundary then turns west to South End Road and Impala Lane, north then east to Lawton Road and Amanda Court, then northwest to the Willamette River. It then follows the Willamette River northeast to the confluence with the Clackamas River, and returns to the starting point.

3.3 Topography and Geology

Oregon City's wetland inventory area includes dramatic topographic variation (Figure 2). The elevation at the confluence of the Willamette and Clackamas Rivers is approximately 10 feet National Geodetic Vertical Datum (NGVD, 1929). Bluffs along the rivers rise steeply to a broad, gently rolling terrace at about 450 feet NGVD. This terrace is cut by steep-walled, high-gradient drainages formed by Abernethy Creek in the center of the inventory area, Beaver Creek south of the inventory area, and their tributaries. Near-surface geology of the Oregon City area is composed of Miocene Columbia River Basalt and Pliocene Boring Lava with more recent fluvial deposits from the Quaternary period.

3.4 Hydrology and Drainage Basins

3.4.1 Overview

The Oregon City LWI study area is located primarily in the Lower Willamette sub-basin of the Willamette basin (Figure 2). A very small part of the inventory area along the Clackamas River is in the Clackamas sub-basin of the Willamette basin. The Lower Willamette portion of the area is further subdivided into drainage basins for Abernethy Creek through the center of the study area, and Beaver Creek in the southern portion of the inventory area. The main stem of Beaver Creek is outside the southern boundary of the study area, but tributaries on the northern side of the creek originate in and flow through the southern part of the inventory area.

3.4.2 Natural Drainage Basins

Abernethy Creek, a perennial stream, is the largest stream within the UGB, and is located inside the inventory area from its mouth to Highway 213. In the eastern portion of the inventory area, Abernethy Creek meanders south of UGB in several areas, including its confluence with Newell Creek. Between its mouth and Newell Creek there are two tributaries that join the northern side of Abernethy Creek. The westernmost tributary (Tour Creek) is not mapped by the USGS. The easternmost tributary (Livesay Creek) is mapped by the USGS as an intermittent stream. Livesay

Creek flows in a deep canyon. Three smaller drainage basins without USGS mapped streams form the headwaters of Livesay Creek. Minor intermittent, unnamed tributaries of Abernethy Creek also run in canyons south of the creek on the eastern edge of the UGB at the northern end of the Country Village development area.

Newell Creek is a major tributary on the southern side of Abernethy Creek. Most of Newell Creek flows in a deep canyon. The UGB includes only the upper parts of the Newell Creek basin and smaller drainage areas of intermittent tributaries that flow into it. Only about 0.1 mile of Newell Creek is actually mapped by the USGS within the study area, northwest of the intersection of Highway 213 and Beavercreek Road. That part of the stream is mapped as perennial.

The Newell Creek headwaters are above the mapped part of the stream, at the ponds of the John Innskeep Environmental Learning Center. These ponds currently receive most of their water from the heating and cooling system of a nearby public school. The water is periodically flushed from the system and drains into the ponds. Natural springs also contribute to the water flow.
After leaving the ponds, water from Newell Creek flows in a gentle gradient through a series of channels and culverts, eventually daylighting in the northwestern corner of the intersection of Highway 213 and South Beavercreek Road. It plunges down a concrete flume for approximately 50 feet, then cascades down a steep decline of boulders and plunge pools to the edge of the study area.

Beaver Creek has four tributaries that drain the southern portion of the inventory area, including Caufield Creek, Mud Creek, and a small tributary known locally as Little Beaver Creek. **Caufield Creek** is the farthest upstream, and drains the southeastern end of the inventory area. At the time of the inventory, properties in the upper Caufield Creek basin, in the vicinity of Glen Oak Road, were undergoing residential development, and much of the eastern end of the stream was in culverts. The creek channel south of Glen Oak Road has been excavated, and part of it apparently has been realigned as road-side drainage ditches. These ditches collect runoff and groundwater that make up the initial flow for Caufield Creek, which is mapped by the USGS as a perennial stream.

An earthen dam south of Highway 213 has created a pond of approximately 2 acres on Caufield Creek. The northern side of the pond is a moderately steep canyon wall, while the eastern side is adjacent to fill for Highway 213. The southern side has more moderate topography, with low-density residential development. Upon exiting the pond, Caufield Creek flows through a shrub and forested wetland and riparian area to the southern edge of the inventory area.

Mud Creek is the next tributary downstream (west) of Caufield Creek. Mud Creek is the longest tributary of Beaver Creek and starts as an intermittent drainage east of the intersection of Linn Avenue and Pease Road. The USGS mapped Mud Creek as an intermittent stream within the inventory area. Most of Mud Creek flows in a modified channel or long culverts and is ponded in small ponds in a city park near the center of the drainage and a small pond at the southern edge of the UGB.

West of Mud Creek is a small, unnamed, intermittent tributary in the area of the intersection of McCord and Leland Roads. The USGS does not map the stream within the study area.

The westernmost tributary of Mud Creek is known locally as **Little Beaver Creek**. This drainage starts just north of the intersection of Pease and Partlow Roads. The USGS does not map the stream within the study area. This stream has natural channels and portions that have been modified. Several smaller tributaries collect and transport groundwater and surface water.

3.4.3 Basin Coding

Wetlands and non-wetland streams identified in the inventory were assigned unique alpha-numeric codes. Each code identifies the drainage basin the wetland or stream is in and coincides with the City's 18 surface water management drainage basins (Figure 3). The City's surface water drainage basins were used at the City's request to provide consistency with established notation. The surface water management drainage basins and their wetland or stream codes are listed below as sub-basins of the major natural drainage basins within the UGB. The surface water drainage basins as mapped by the City were modified slightly in a few places, where the natural drainage basin extended beyond the mapped boundaries.
For example, for LWI mapping and coding purposes, the southern tip of the Kelly Field surface water management basin is included in the Abernethy Creek Basin, and a portion of the South End basin extends into the Amanda Court surface water management basin.

The **Clackamas** basin includes only floodplains of the Clackamas River basin (CL).

The **Willamette** basin includes several basins: Willamette North (no wetlands mapped); Singer Creek (SI); Tumwater (no wetlands mapped); Clinton (no wetlands mapped); Coffee Creek (CO); and Amanda Court (AC).

The **Abernethy Creek** basin includes: Park Place (PP); Forsythe (FO); Livesay Creek (LI); Abernethy Creek (AB); John Adams (JA); Newell Creek (NE); and Thimble (TH).

The **Beaver Creek** basin includes: Caufield Creek (CA); Mud Creek (MU); Central Point (CP); and South End (SE).

3.5 Soils

3.5.1 Overview

Most of the soils in the Oregon City study area were formed in mixed alluvium, stratified glaciolacustrine deposits, and colluvium derived mainly from basalt. Alluvium is unconsolidated sediments deposited by streams. Glaciolacustrine refers to sediments derived from glaciers and deposited in lakes. Colluvium is unconsolidated deposits on a slope or at the foot of a cliff, brought there by mass wasting.

There are three major soil associations mapped in the study area: the Cloquato-Newberg-McBee association (map unit 1), the Aloha-Woodburn association (map unit 4), and the Jory-Saum association (map unit 10).

The Cloquato-Newberg-McBee association consists of deep, well-drained, somewhat excessively-drained, and moderately well-drained soils formed in mixed alluvium. These soils are found on the floodplains of major streams and are subject to flooding. The association is mapped in the northern part of the study area near the Willamette and Clackamas Rivers, and near Abernethy Creek. It is about 35% Cloquato and similar soils (found on floodplains), 20% Newberg and similar soils (found on natural levees of floodplains), and 15% McBee and similar soils (found in slightly concave positions on floodplains). The remaining 30% is composed of Chehalis, Wapato, McBee Variant, and Camas soils. Soils of this unit are used for cultivated crop production, recreation, wildlife habitat, and home site development. The main limitation of this association is the hazard of flooding.

The Aloha-Woodburn association consists of deep, somewhat poorly-drained, moderately-drained, and moderately well-drained soils that formed in stratified glaciolacustrine deposits. These soils are found mainly on broad valley terraces incised by the Willamette River. Sometimes they are found on long, narrow terraces incised by the Clackamas River. The association is mapped generally in the middle zone of the study area and along the Willamette River. It is about 40% Aloha and similar soils (found in nearly level and gently sloping areas on terraces) and about 20% Woodburn and similar soils (found in nearly level to moderately steep, convex positions on broad terraces). Of the remaining 40%, only Amity, Cove, Salem, and Wapato soils are found in the study area. The soils of this unit are used for cultivated crops, timber production, wildlife habitat, and home site development. Their main limitations are a seasonal high water table and restricted permeability.

The Jory-Saum association consists of deep, well-drained soils that formed in colluvium derived mainly from basalt and are found mainly on rolling hills. The association is mapped generally in the middle to southern zones of the study area. It is about 50% Jory and similar soils, and about 15% Saum and similar soils. Of the remaining 35%, only Borges, Bornstedt, Cottrell, Hardscrabble, and Nekia soils are found in the study area. Soils in the unit are used for timber production, hay, and pasture. The acidity of the soils, low fertility, and steep slopes are limiting factors to cultivated crop production. Restricted permeability, low soil strength, and steeper slopes are the main limitations to home site development.

3.5.2 Soil Types

Forty soil types are mapped within the Oregon City UGB. These soils and their mapping codes are shown in Table 1. Hydric soils and soils with hydric inclusions and wet spots also are indicated in the table. Mapping units are shown in Figure 4. Hydric soils are mapped in only seven scattered areas within a few basins, including: South End, Central Point, Amanda Court, a small area within Newell Creek, along Abernethy Creek, and two areas within the Clackamas floodplain. However, soils with hydric soil inclusions are mapped in much of the study area.

Hydric Soil Series

Borges silty clay loam, 0 to 8% slopes (7B), is a poorly-drained soil formed in mixed clayey alluvium and found in concave areas on rolling uplands and high terraces. A common profile has a surface layer of very dark gray and very dark grayish brown silty clay loam about 6 inches thick. The subsoil layer consists of about 6 inches of dark grayish brown silty clay loam. The upper 27

Table 2. U.S. Fish and Wildlife Service Wetland Classes Mapped by the National Wetlands Inventory within the Oregon City Urban Growth Boundary

Code	Cowardin Classification of NWI Mapped Wetlands within the Oregon City UGB
L10WKZx	lacustrine, limnetic, open water, artificially flooded, intermittently exposed/permanent, excavated
PSS/EM1Y	palustrine, shrub-scrub, broad-leaved deciduous/emergent, persistant, saturated/semipermanent/seasonal
PSS/FL1Y	palustrine, shrub-scrub, broad-leaved deciduous/flat, cobble/gravel, saturated/semipermanent/seasonal
PEM1Y	palustrine, emergent, persistent, saturated/semipermanent/seasonal
PEM1Yx	palustrine, emergent, persistent, saturated/semipermanent/seasonal, excavated
PFO1Y	palustrine, forested, broad-leaved deciduous, saturated/semipermanent
POWZ	palustrine, open water, intermittently exposed/permanent
POWKZh	palustrine, open water, artificially flooded, intermittently exposed/permanent, diked/impounded
POWKZx	palustrine, open water, artificially flooded, intermittently exposed/permanent, excavated
PSS1Y	palustrine, scrub-shrub, broad-leaved deciduous, saturated/semipermanent/seasonal
R1OWV	riverine, tidal, open water, permanent-tidal
R2OWZ	riverine, lower perennial, open water, intermittently exposed/permanent
R3OWZ	riverine, upper perennial, open water, intermittently exposed/permanent

Table 3. Oregon City Wetlands, Wetland Area, and USFWS Wetland Classifications*

Wetland Code	Drainage Basin	USFWS Wetland Classification					Total Acreage
		PEM	PFO	PSS	POW	RSB	
AB-2	Abernethy Creek	0.9	0.4				1.3
AB-3	Abernethy Creek	0.1	0.7				0.8
AB-4	Abernethy Creek	0.1					0.1
AC-1	Amanda Court	0.6	0.5	1.8			2.9
AC-2	Amanda Court	0.5	0.6				1.1
AC-3	Amanda Court		2.4	1.1			3.5
AC-4	Amanda Court	0.2	0.4	0.2			0.8
CA-1	Caufield Creek	0.8		1.6			2.4
CA-2	Caufield Creek	1.8		1.1			2.9
CA-3	Caufield Creek	0.6			1.5		2.1
CA-4	Caufield Creek		2.9	2.2			5.1
CA-5	Caufield Creek		7.0				7.0
CA-6	Caufield Creek	0.7	0.5				1.2
CA-7	Caufield Creek	0.2	0.1				0.3
CL-1	Clackamas River	0.3					0.3
CL-2	Clackamas River				1.3		1.3
CL-3	Clackamas River	0.4	5.9				6.3
CL-4	Clackamas River	2.0					2.0
CO-1	Coffee Creek	1.1					1.1
CO-3	Coffee Creek			0.1	0.1		0.2
CO-4	Coffee Creek			0.6			0.6
CP-1	Central Point	0.1					0.1
CP-2	Central Point	0.3					0.3
CP-3	Central Point		0.8			0.1	0.9
FO-1	Forsythe	1.2					1.2
LI-2	Livesay Creek	1.9	1.9			0.3	4.1
LI-3	Livesay Creek					0.8	0.8
LI-4	Livesay Creek	0.7	0.6				1.3
LI-5	Livesay Creek	0.2	0.2			0.1	0.5
MU-1	Mud Creek			0.2			0.2
MU-2	Mud Creek	0.1				0.1	0.2
MU-3	Mud Creek	0.4					0.4
MU-4	Mud Creek	0.1			1.0		1.1
MU-5	Mud Creek		0.1	0.1			0.2
MU-6	Mud Creek		0.6		0.6		1.2
MU-8	Mud Creek	0.5					0.5
NE-1	Newell Creek	0.1	0.4			0.4	0.9
NE-2	Newell Creek	2.0		1.0			3.0
NE-3	Newell Creek			0.3			0.3

Table 3. Oregon City Wetlands, Wetland Area, and USFWS Wetland Classifications*

Wetland Code	Drainage Basin	USFWS Wetland Classification					Total Acreage
		PEM	PFO	PSS	POW	RSB	
NE-5	Newell Creek			0.3	0.2		0.5
NE-8	Newell Creek			1.0			1.0
NE-9	Newell Creek	0.1	0.1		0.4		0.6
PP-1	Park Place			1.5			1.5
PP-2	Park Place			1.0			1.0
PP-3	Park Place	0.8					0.8
PP-4	Park Place	0.4					0.4
SE-1	South End		1.1				1.1
SE-2	South End	2.0	1.0	2.7	0.1		5.8
SE-3	South End	1.4	3.3				4.7
TH-1	Thimble				0.3		0.3
TOTALS		22.6	31.5	16.8	5.5	1.8	78.2

* Wetland type according to wetland designations and the classification system developed by the USFWS and included in "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin et al, 1979).

PEM = palustrine emergent
PFO = palustrine forested
PSS = palustrine shrub/scrub
POW = palustrine open water.
RSB = riverine streambed (intermittent)

Stream Code	Drainage Basin	Total Acreage
AB-1	Abernethy Creek	7.7
CA-8	Caufield Creek	0.3
CO-2	Coffee Creek	0.6
JA-1	John Adams	0.1
JA-2	John Adams	0.1
LI-1	Livesay Creek	0.3
MU-7	Mud Creek	1
NE-4	Newell Creek	0.9
NE-6	Newell Creek	0.3
NE-7	Newell Creek	1.3
NE-10	Newell Creek	0.1
NE-11	Newell Creek	0.1
SI-1	Singer Creek	1.3
SI-2	Singer Creek	1.6
SUBTOTAL		15.7
Total Wetland Acreage		78.2
Total Stream Acreage		15.7
CUMULATIVE TOTALS		93.9

4.1.2 Wetland Location and Acreage

A total of 78.2 acres of wetlands and streams was mapped within the study area. Four wetlands were mapped in the Clackamas River drainage basin, totaling 9.8 acres or 13% of the wetlands mapped in the inventory.

In the Willamette River basin, seven wetlands were mapped in two sub-basins, totaling 10.2 acres or 13% of the wetlands mapped in the inventory. Four of these wetlands are in the Amanda Court basin, and total 8.3 acres or 11% of the inventory. The Coffee Creek basin has three wetlands, totaling 1.9 acres or 2% of the inventory.

The Beaver Creek basin has 20 wetlands in four sub-basins. The total acreage is 37.7 acres or 48% of the inventory. The Caufield Creek basin has seven wetlands totaling 21 acres or 27% of the inventory. The Mud Creek basin also has seven wetlands, giving a total of 3.8 acres or 5% of the inventory. The Central Point and South End basins each have three wetlands, totaling 1.3 acres or 2%, and 11.6 acres or 15%, respectively.

The Abernethy Creek Basin has 19 wetlands in 6 sub-basins, totaling 20.4 acres or 26% of the mapped wetlands. The Abernethy Creek basin has three wetlands totaling 2.2 acres or 3% of the total. The Forsythe basin has one wetland of 1.2 acres or 2% of the total inventory. The Livesay Creek basin has four wetlands adding up to 6.7 acres or 9% of the total. The Newell Creek basin has six wetlands that total 6.3 acres or 9% of the total wetland acreage. Park Place has four wetlands that total 3.7 acres or 5% of the total, and Thimble basin has one wetland unit that totals 0.3 acre or 0.4% of the total.

4.1.3 Non-Wetland Stream Location and Acreage

A total of 15.7 acres of non-wetland streams was mapped within the study area (Figure 6). One stream was mapped in the Abernethy Creek sub-basin, totaling 7.7 acres or 49% of the non-wetland streams mapped in the study. The remaining twelve stream segments, mapped in the Caufield Creek, John Adams, Livesay Creek, Mud Creek, Newell Creek, and Singer Creek sub-basins, total 8.0 acres or 51% of the mapped non-wetland streams.

4.2 Oregon Freshwater Wetland Assessment Methodology Results

The results of the OFWAM are summarized in Table 4. The functional level of each assessed characteristic is shown for each wetland. These functional levels are derived directly from the assessment summary forms. Detailed responses used to generate the summary results are available on the data forms for each wetland, which are provided in Appendix B. This table is useful primarily for obtaining an overview of the current and potential functional status of each wetland. More detailed information (individual OFWAM data sheets) should be consulted before making decisions regarding any wetland.

Table 1. Soil Types within the Oregon City UGB, continued

Soil Type	Map Code	Hydric*	Drainage Class	Erosion Hazard
Jory silty clay loam 15 to 30 percent slopes	45D	No	Well drained	Severe
Jory stony silt loam 3 to 8 percent slopes	46B	No	Well drained	Slight
Jory stony silt loam 8 to 15 percent slopes	46C	No	Well drained	Moderate
Laurelwood silt loam	54B	No[2]	Well drained	Slight
McBee silty clay loam	56	No[1]	Moderately well drained	Slight
Nekia silty clay loam	64B	No	Well drained	Slight
Newberg fine sandy loam	67	No	Somewhat excessively drained	Slight
Riverwash	73	Yes	Not listed	Not listed
Salem silt loam	76B	No	Well drained	Slight
Saum silt loam 3 to 8 percent slopes	78B	No	Well drained	Slight
Saum silt loam 8 to 15 percent slopes	78C	No	Well drained	Moderate
Saum silt loam 15 to 30 percent slopes	78D	No	Well drained	Moderate
Saum silt loam 30 to 60 percent slopes	78E	No	Well drained	Severe
Urban land	82	No	Not listed	Not Listed
Wapato silty clay loam	84	Yes	Poorly drained	Slight
Woodburn silt loam 0 to 3 percent slopes	91A	No[1,2]	Moderately well drained	Slight
Woodburn silt loam 3 to 8 percent slopes	91B	No[1,2]	Moderately well drained	Slight
Woodburn silt loam 8 to 15 percent slopes	91C	No[1,2]	Moderately well drained	Moderate
Xerochrepts and Haploxerolls, very steep	92F	No	Well drained	Severe
Xerochrepts-Rock outcrop complex, moderately steep	93E	No	Well drained	Moderate

*Notes: [1] may have inclusions of hydric soils
[2] may contain wet spots

inches of the substratum are dark gray and grayish brown silty clay, and the lower part to a depth of 60 inches or more is brown and grayish brown clay loam. The soil is classified as fine, mixed, nonacid, mesic Typic Humaquepts. Permeability is very slow.

Cove silty clay loam (25), is a poorly-drained soil with very slow permeability located on floodplains and formed in clayey alluvium. It is classified as fine, montmorillonitic, mesic Vertic Haplaquolls. The surface layer is black silty clay loam about 7 inches thick. The subsoil is about 36 inches thick, and is black and very dark gray silty clay. The substratum is dark grayish brown silty clay to a depth of 60 inches or more.

Delena silt loam, 3 to 12% slopes (30C), is a poorly-drained soil formed in silty alluvium and is found on high terraces and rolling uplands. A typical profile consists of a surface layer about 12 inches thick of very dark grayish brown silt loam. The upper layer of the subsoil is dark grayish brown and grayish brown silty clay loam about 13 inches thick. The lower subsoil layer is grayish brown, dark grayish brown, and yellowish red cemented silty clay loam hardpan about 35 inches thick. Depth to the hardpan ranges from 20 to 30 inches. Permeability is moderate to a depth of 25 inches and very slow below this depth.

Riverwash, 0 to 3% slopes (73), consists of cobbles, stones, gravel, and sand in narrow, irregular strips along the major streams and rivers in the study area. The strips are 0 to 10 feet above the water level of the rivers and streams, and range from 20 to 200 yards wide. Riverwash is 40 inches to several feet thick. This material supports little vegetation.

Wapato silty clay loam (84), is a poorly-drained soil formed in mixed alluvium and found on floodplains. It is classified as fine-silty, mixed, mesic Fluvaquentic Haplaquolls. The surface layer is mottled silty clay loam about 18 inches thick, very dark brown and dark grayish brown. The subsoil is mottled silty clay loam, dark grayish brown in color, and about 27 inches thick. Below the subsoil to a depth of 60 inches or more is grayish brown, mottled silty clay.

Huberly silt loam (41) is a poorly drained soil that formed in glaciolacustrine deposits on terraces. The surface layer is 8 inches thick, very dark gray (10YR6/1) silt loam with few, faint, dark gray (10YR4/1) mottles and an abrupt, smooth boundary. The second layer is 8 to 15 inches thick, grayish-brown (10YR5/2) silt loam with a clear boundary. The third layer, 15 to 24 inches thick, is dark grayish-brown (10YR5/2) heavy silt loam with many fine, distinct, dark brown (7.5YR4/2) mottles.

3.6 Vegetation

3.6.1 Historical Overview

Oregon City is on the eastern edge of the Willamette Valley unit of the Interior Valley zone of Western Oregon (Franklin and Dyrness, 1973). This zone is the warmest and driest region west of the Cascade Range because of its position in the rain shadow of the Coast Range. Vegetation in the Willamette Valley has been subject to human manipulation for centuries. Native Americans controlled vegetation on extensive areas of the valley by seasonal burning (Johannessen, 1971). Grazing, farming, logging, and development that accompanied Euroamerican occupation of the area changed the native vegetation communities extensively and rapidly.

According to Franklin and Dyrness, four major vegetation communities probably existed in the Willamette Valley before Euroamerican occupation: oak woodland, coniferous forest, grassland, and riparian communities. Based on information from Johannessen, grassland was probably not a major community type in the area that is now Oregon City. Remnants of the other three community types still exist in the inventory area and are described in the following section (Section 3.6.2).

An important subset of the riparian community type is wetland vegetation. While not addressed specifically by Franklin and Dyrness, it is included in the discussion below because of its significance in the present work.

3.6.2 Vegetation Communities

Oak Woodland

Oak woodland is dominated by Oregon white oak (*Quercus garryana*). Other tree species sometimes present are Douglas-fir (*Pseudotsuga menziesii*) and bigleaf maple (*Acer macrophyllum*). Oak woodlands in Oregon City are most common on flat terraces. A typical example of oak woodland in Oregon City is on the southeastern corner of the Clackamas Community College campus.

Coniferous Forest

Douglas-fir is the dominant tree in the coniferous forest community. Grand fir (*Abies grandis*) and bigleaf maple are common minor constituents of this community. This community is most common in the sloping areas of the UGB. The fir grove in the Newell Creek canyon northwest of the intersection of Highway 213 and South Beavercreek Road is an example of this vegetation type.

Riparian

Black cottonwood (*Populus balsamifera*) and Oregon ash (*Fraxinus latifolia*) dominate riparian communities. Various willow (*Salix*) species are common in this association. Riparian woodlands are still found in Oregon City along the major streams and floodplains. Areas along Abernethy Creek support an ash forest.

Wetland

Wetland areas are associated with most drainages within the inventory area. Vegetation in Oregon City's wetlands is diverse, varying from grasses and other herbaceous plants to trees. Many of the wetlands in Oregon City are palustrine emergent (PEM). A common grass in unmaintained sites is reed canarygrass (*Phalaris arundinacea*), which is found in and along many of the stream channels and drainage ditches. Broadleaf cattail (*Typha latifolia*) is also found in these areas, if there is sufficient duration of wet conditions.

In Oregon City, the palustrine scrub/shrub (PSS) and forest species (PFO) are often found growing intermingled. Major scrub/shrub species include clustered wild rose (*Rosa pisocarpa*), Nootka rose (*R. nutkana*), several willow species, salmonberry (*Rubus spectabilis*), Douglas' hawthorn

(*Crataegus douglasii*), red-osier dogwood (*Cornus sericea* ssp. *sericea* [*Cornus stolonifera*]), Douglas spiraea (*Spiraea douglasii*) and Pacific ninebark (*Physocarpus capitatus*). Wetland trees include Oregon ash, black cottonwood, red alder (*Alnus rubra*), and western redcedar (*Thuja plicata*).

4.0 WETLAND FINDINGS

4.1 Wetland Classification and Location

4.1.1 Wetland Types and Classification

The USFWS, as part of the NWI program, mapped wetlands in the study area (Figure 5). The NWI maps are generated primarily on the basis of interpretation of small-scale (1" = 4,833' [1:58000]), color infrared aerial photographs. Limited ground reconnaissance is conducted to confirm the interpretations. Table 2 shows the Cowardin classifications of wetlands identified by the NWI in Oregon City. The LWI conducted by SHAPIRO identified many wetlands within the Oregon City UGB that were not mapped by the NWI.

Figure 6 shows the location of 50 wetlands mapped in the inventory. A total of 78.2 acres of wetlands and streams was mapped within the UGB. Table 3 lists each wetland with its area and wetland classification. Most of the wetlands were identified using the Routine Onsite method of the 1987 manual. In areas where property access was denied, wetland boundaries were determined from off the site using aerial photographs, topographic maps, observation from adjacent properties, and other pertinent information (refer to Section 3.3.2). Wetlands inventoried by the LWI are identified as palustrine forested (PFO), palustrine emergent (PEM), palustrine scrub/shrub (PSS), palustrine open water (POW), or riverine (RSB; Table 3).

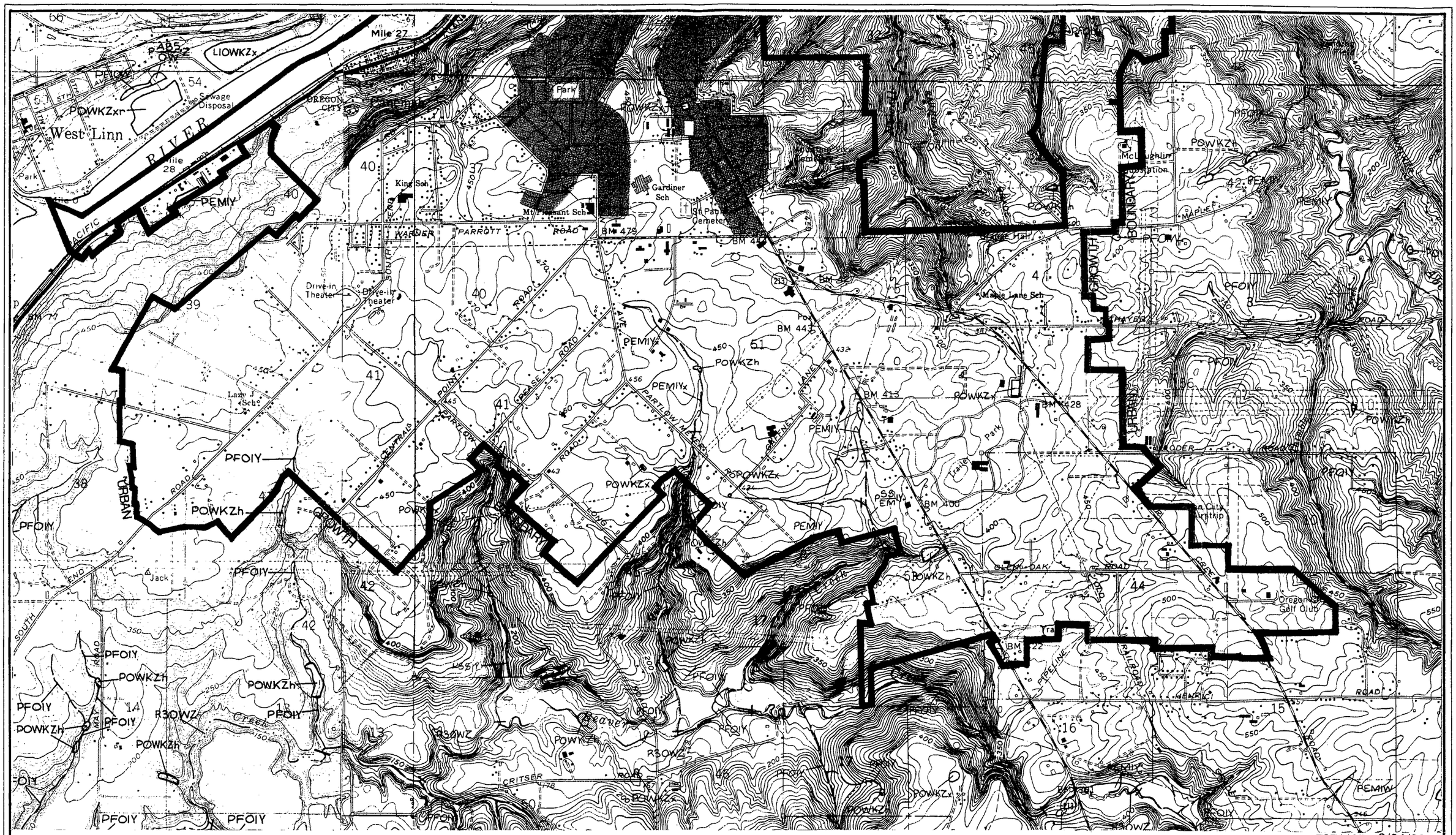
Palustrine forested (PFO) wetland accounts for the majority (40%) of wetland acreage mapped in the inventory. These wetlands are vegetated by Oregon ash and Oregon white oak. Many of these wetlands are associated with streams and may experience some degree of inundation during the winter and early part of the growing season.

Palustrine emergent PEM wetlands comprise the second largest category of mapped wetlands (29% of the total). The largest amount of this type of wetland is in the Caufield basin.

Palustrine scrub-shrub (PSS) wetlands are found in seven basins in the inventory area, making up 21% of the total. The largest amount of this type of wetland is found in the Newell Creek basin.

Riverine streambed (RSB) streams are unvegetated channels found in the many streams in wetlands within six of the basins (2% of the total). The largest amount of this kind of wetland is found in the Livesay Creek basin.

Palustrine open water (POW) wetlands are uncommon within the inventory area, but are found in seven of the basins.

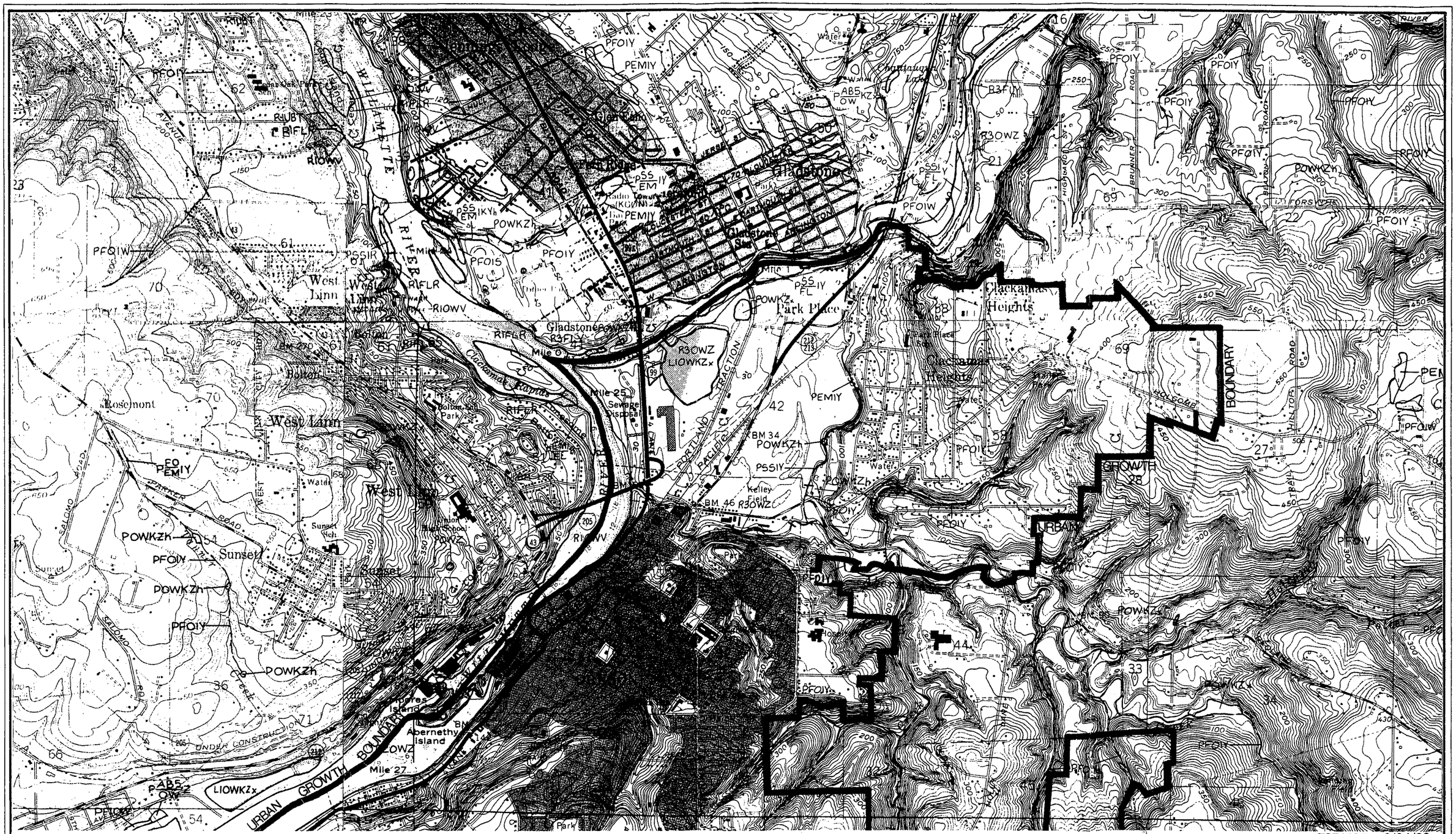


SOUTHERN HALF

National Wetlands Inventory designations of the Oregon City Local Wetlands Inventory study area, Oregon (U.S. Fish and Wildlife Service, Lake Oswego, Gladstone, Canby, and Oregon City, Oregon, 7.5-minute quadrangles, 1:24000, based on 1981 color infrared photography).

FIGURE 5b

SHAPIRO & ASSOCIATES, INC.


West Linn
Gladstone
Park Place
Clackamas Heights
Rosemont
Sunset
Abernethy Island
Mile 25
Mile 27
Mile 6
Mile 1
Sewage Disposal
Bolton Park
Union High School
Sunset Park
Clackamas Rapids
Willamette River
Clackamas River
Portland Traction
Portland Pacific
Parker Road
Salomo Road
Highway 99E
Brownsville Road
Brin Road
Holcomb Blvd
Pimlico Drive
Hilltop Road
Forsythe Road
Water
Radio Tower (KGW)
Radio Tower (KOIN)
Sch
Park
Cem
Ch
Cr
Ave
Rd
Dr
Ln
Pl
Ct
Hts
Jct
Sta
Mtn
Pk
Trail
Bldg
Tank
Tr
Ter
Blvd
Hwy
Sq
Mdw
Mdws
Vly
Vlg
Vw
Wy
Cir
Crk
Fwy
Gdn
Gdns
Grn
Grv
Hl
Hls
Hvn
Ind
Isl
Jct
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ZONING MAP

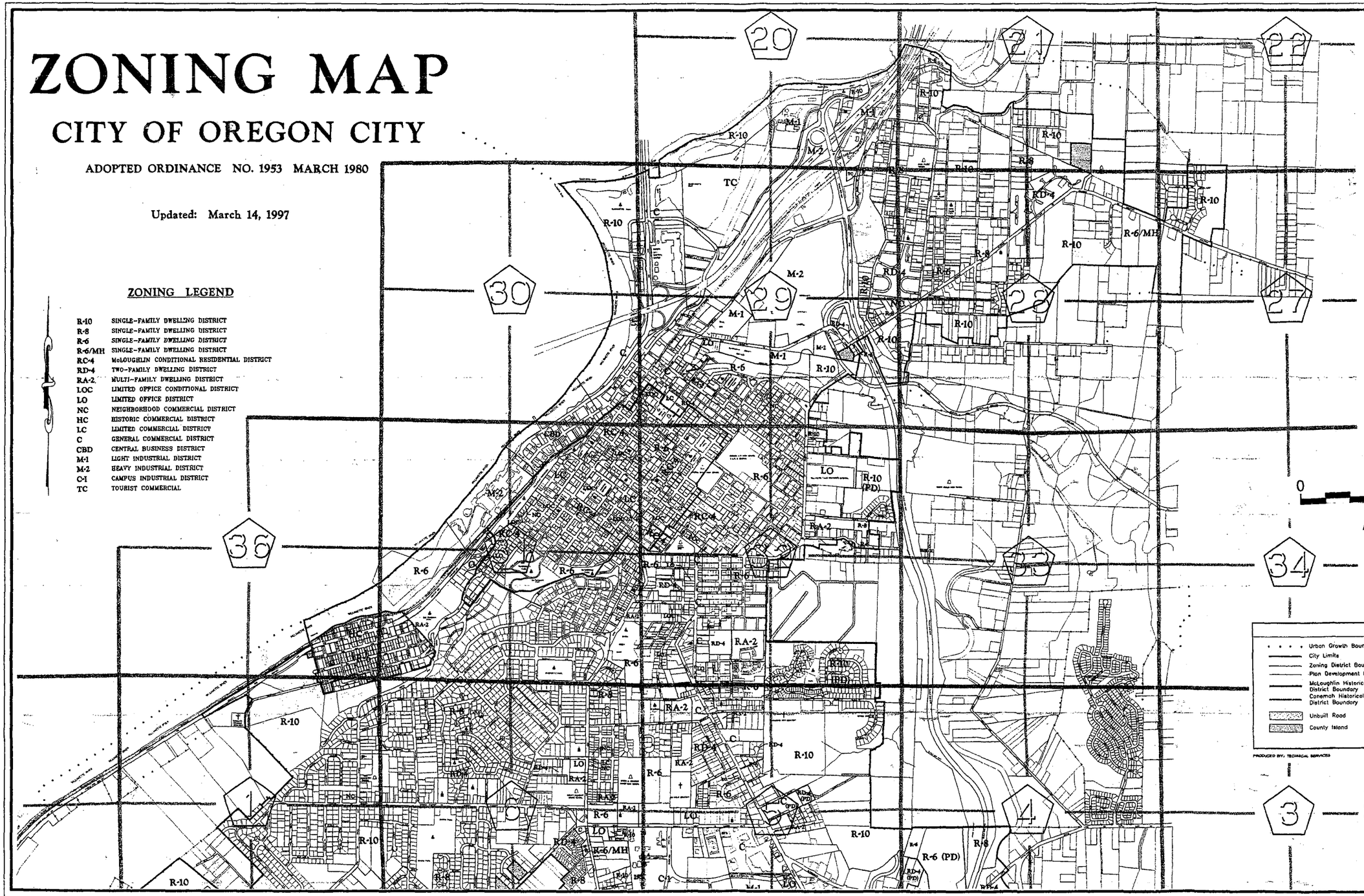
CITY OF OREGON CITY

ADOPTED ORDINANCE NO. 1953 MARCH 1980

Updated: March 14, 1997

ZONING LEGEND

R-10	SINGLE-FAMILY DWELLING DISTRICT
R-8	SINGLE-FAMILY DWELLING DISTRICT
R-6	SINGLE-FAMILY DWELLING DISTRICT
R-6/MH	SINGLE-FAMILY DWELLING DISTRICT
RC-4	McLOUGHLIN CONDITIONAL RESIDENTIAL DISTRICT
RD-4	TWO-FAMILY DWELLING DISTRICT
RA-2	MULTI-FAMILY DWELLING DISTRICT
LOC	LIMITED OFFICE CONDITIONAL DISTRICT
LO	LIMITED OFFICE DISTRICT
NC	NEIGHBORHOOD COMMERCIAL DISTRICT
HC	HISTORIC COMMERCIAL DISTRICT
LC	LIMITED COMMERCIAL DISTRICT
C	GENERAL COMMERCIAL DISTRICT
CBD	CENTRAL BUSINESS DISTRICT
M-1	LIGHT INDUSTRIAL DISTRICT
M-2	HEAVY INDUSTRIAL DISTRICT
C-I	CAMPUS INDUSTRIAL DISTRICT
TC	TOURIST COMMERCIAL



NORTHERN HALF

FIGURE 1a

Urban Growth Boundary and zoning of Oregon City, Oregon.

SHAPIRO & ASSOCIATES, INC.

ZONING MAP

CITY OF OREGON CITY

ADOPTED ORDINANCE NO. 1953 MARCH 1980

Updated: March 14, 1997

ZONING LEGEND

R-10	SINGLE-FAMILY DWELLING DISTRICT
R-8	SINGLE-FAMILY DWELLING DISTRICT
R-6	SINGLE-FAMILY DWELLING DISTRICT
R-6/MH	SINGLE-FAMILY DWELLING DISTRICT
RD-4	McLOUGHLIN CONDITIONAL RESIDENTIAL DISTRICT
RD-4	TWO-FAMILY DWELLING DISTRICT
RA-2	MULTI-FAMILY DWELLING DISTRICT
LOC	LIMITED OFFICE CONDITIONAL DISTRICT
LO	LIMITED OFFICE DISTRICT
NC	NEIGHBORHOOD COMMERCIAL DISTRICT
HC	HISTORIC COMMERCIAL DISTRICT
LC	LIMITED COMMERCIAL DISTRICT
C	GENERAL COMMERCIAL DISTRICT
CBD	CENTRAL BUSINESS DISTRICT
M-1	LIGHT INDUSTRIAL DISTRICT
M-2	HEAVY INDUSTRIAL DISTRICT
C-1	CAMPUS INDUSTRIAL DISTRICT
TC	TOURIST COMMERCIAL

0 2000 4000

FEET

Approximate

LEGEND

- Urban Growth Boundary
- City Limits
- Zoning District Boundary
- Plan Development Boundary
- McLoughlin Historical District Boundary
- Canemah Historical District Boundary
- Unbuilt Road
- County Island
- Public School / College
- Cemetery
- Church
- Park

The information on this map is derived from Oregon City's digital database. However, there may be map errors or omissions. Please contact Oregon City directly to verify map information. Notification of any errors will be appreciated. For question or comments phone 657-0891.

DRAWING NAME: G:\pw\projects\zoning\mapzone.dwg

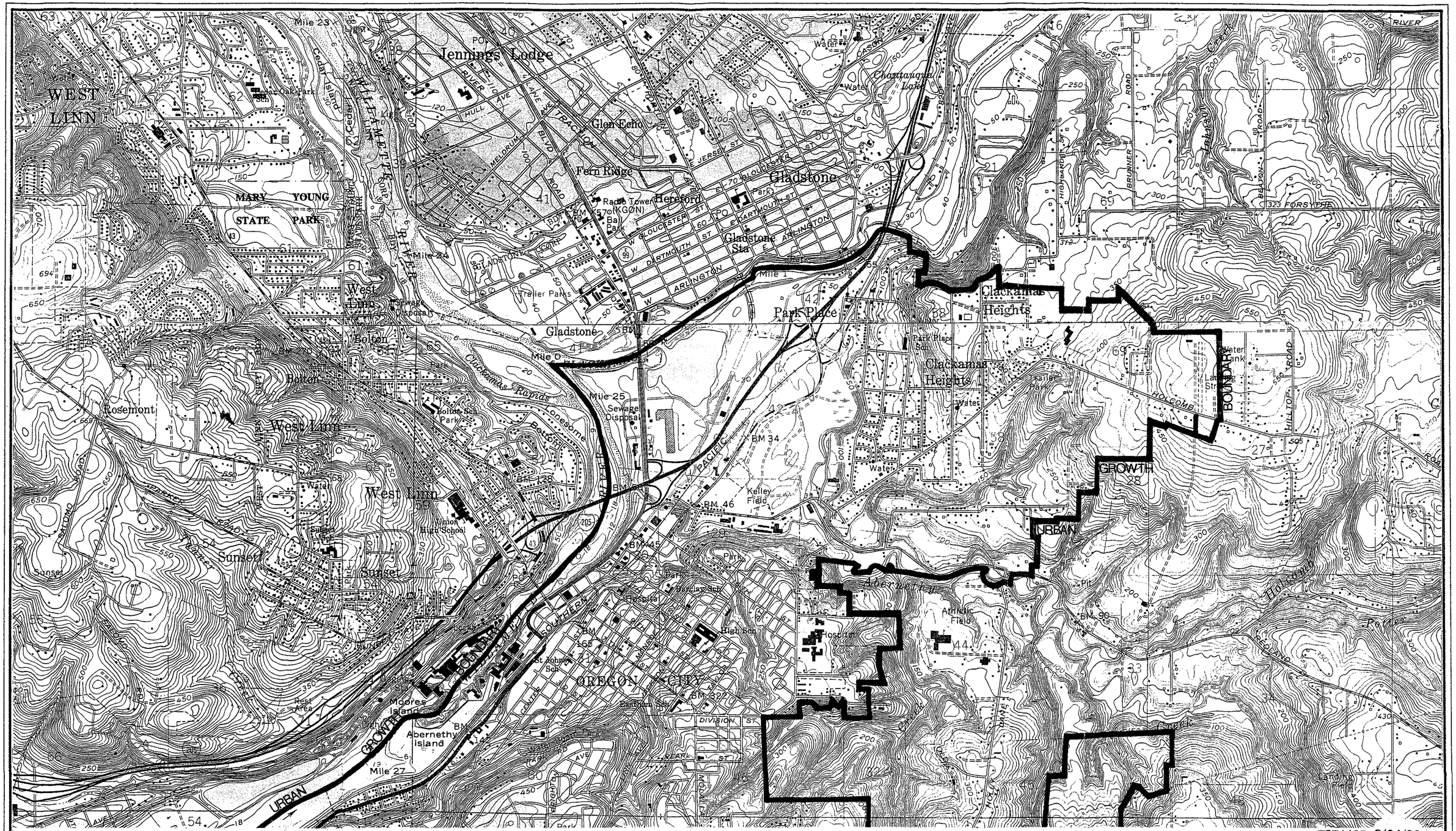
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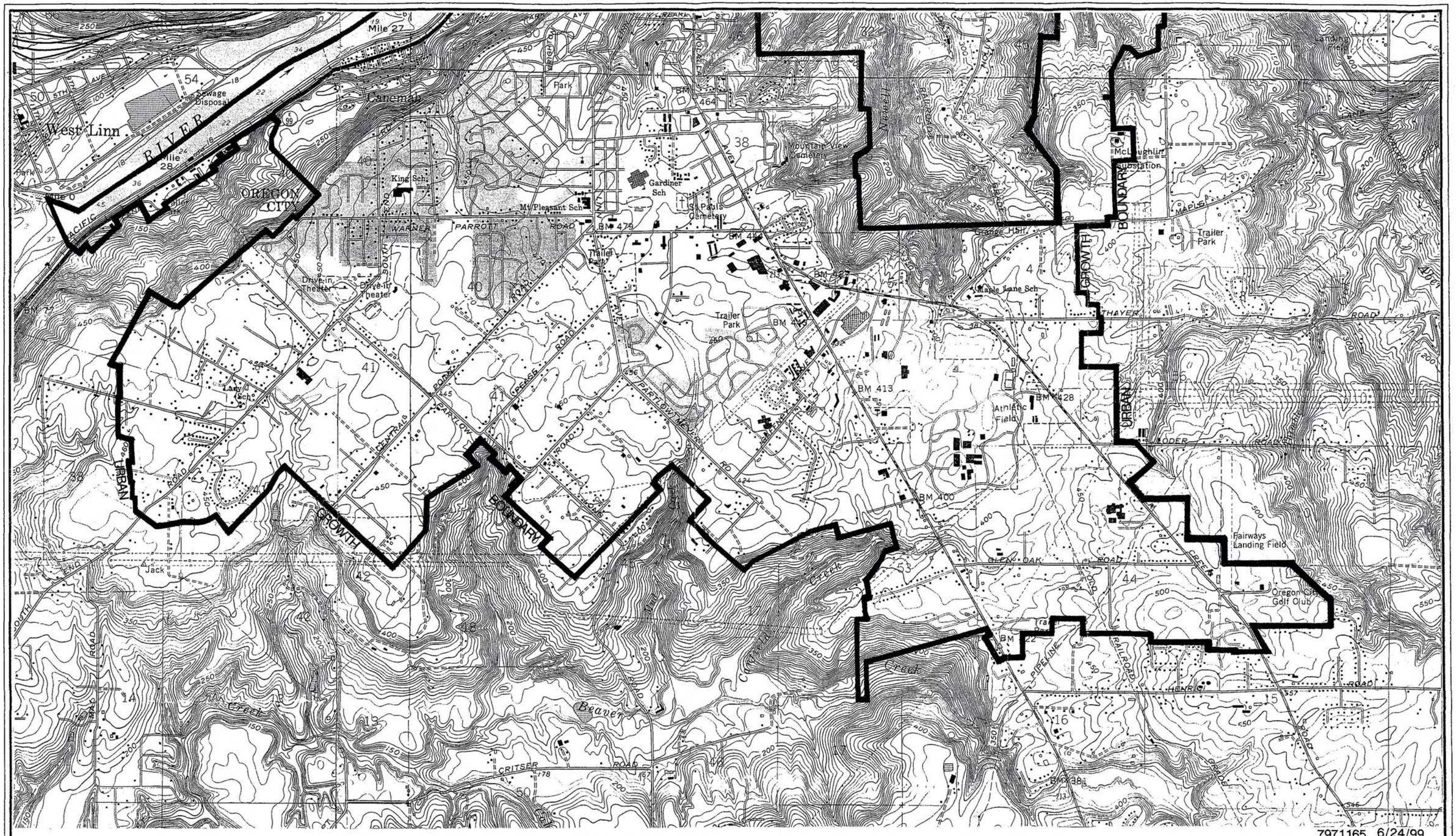
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SOUTHERN HALF

FIGURE 1h

Urban Growth Boundary and zoning of Oregon City, Oregon.


WEST LINN
Jennings Lodge
Gladstone
Glen Echo
Fern Ridge
Hereford
Park Place
Clackamas Heights
West Linn
Bolton
Rosemont
Sunset
Oregon City
Willamette River
Clackamas Rapids
Mary Young State Park
Cedar Oak Park
Bolton Sch. Park
Union High School
Moores Island
Abernethy Island
Mile 23
Mile 24
Mile 25
Mile 27
Mile 0
Mile 1
Chautauqua Lake
Kelley Field
Athletic Field
Park Place Sub.
Gladstone Sta.
Trailer Parks
Sewage Disposal
Radio Tower (KGON)
Water Tank
Pit
Landing Field
Clackamas River
Holcomb Creek
Rock Creek
Tualatin River
Abernethy Creek
Hull Ave.
Dartmouth St.
Arlington
Gloucester St.
Jersey St.
Division St.
Park Place Ave.
Highway 99E
Pacific Highway
Southern Pacific
Portland Traction
Caufield Rd.
Brunner Road
Beavercreek Road
Forsythe Road
Holcomb Blvd.
Hillcrest Road
Hull Ave.
Meldrum Blvd.
Linn Ave.
Trail View Dr.
Cedar Island
Lake Oswego-Portland
Lake Oswego-Oregon City
Lake Oswego-Tigard
Portland-Oregon City
Portland-Gladstone
Portland-Milwaukie
Portland-Lake Oswego
Gladstone-Oregon City
Gladstone-Milwaukie
Gladstone-Lake Oswego
Oregon City-Milwaukie
Oregon City-Lake Oswego
Milwaukie-Lake Oswego
Tigard-Lake Oswego
Tigard-Oregon City
Tigard-Milwaukie
Tigard-Gladstone
Tigard-Portland
Lake Oswego-Gladstone
Lake Oswego-Milwaukie
Lake Oswego-Oregon City
Lake Oswego-Tigard
Lake Oswego-Portland
Oregon City-Gladstone
Oregon City-Milwaukie
Oregon City-Lake Oswego
Oregon City-Tigard
Oregon City-Portland
Milwaukie-Gladstone
Milwaukie-Oregon City
Milwaukie-Lake Oswego
Milwaukie-Tigard
Milwaukie-Portland
Gladstone-Milwaukie
Gladstone-Oregon City
Gladstone-Lake Oswego
Gladstone-Tigard
Gladstone-Portland
Portland-Milwaukie
Portland-Gladstone
Portland-Oregon City
Portland-Lake Oswego
Portland-Tigard
Tigard-Milwaukie
Tigard-Gladstone
Tigard-Oregon City
Tigard-Lake Oswego
Tigard-Portland
Lake Oswego-Milwaukie
Lake Oswego-Gladstone
Lake Oswego-Oregon City
Lake Oswego-Tigard
Lake Oswego-Portland
Oregon City-Milwaukie
Oregon City-Gladstone



SOUTHERN HALF

Location and generalized topography of the Oregon City Local Wetlands Inventory study area, Oregon (U.S.G.S. 7.5-minute quadrangles, 1:24000, Lake Oswego 1961 photorevised 1984, Gladstone 1961 photorevised 1984, Canby 1961 photorevised 1985, and Oregon City 1961 photorevised 1985, Oregon).

FIGURE 2b

SHAPIRO & ASSOCIATES, INC.



FIGURE 3

Surface water management basins within the Oregon City Local Wetlands Inventory study area, Oregon.

SHAPIRO & ASSOCIATES, INC.

Wetlands
Streams

SOUTHERN
HALF

Base map from City of Oregon City, Oregon, 1997

7971165 6/24/99

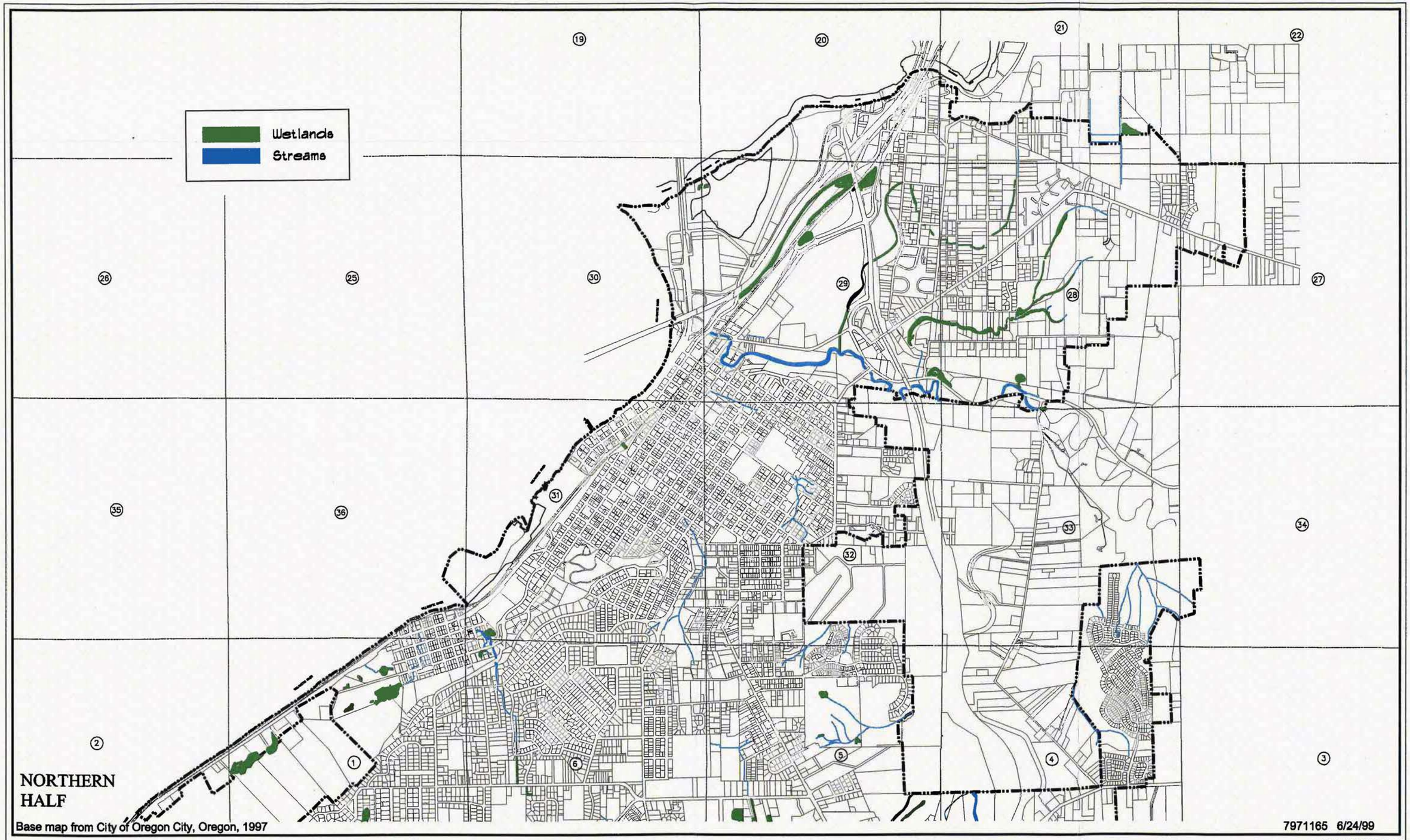
NORTH

0 2000 4000
FEET

Wetlands, drainages, and riparian areas identified by the Local Wetlands Inventory of the area within Oregon City's Urban Growth Boundary.

FIGURE
6b

SHAPIRO & ASSOCIATES, INC.



Wetlands, drainages, and riparian areas identified by the Local Wetlands Inventory of the area within Oregon City's Urban Growth Boundary.

FIGURE
6a

SHAPIRO & ASSOCIATES, INC.

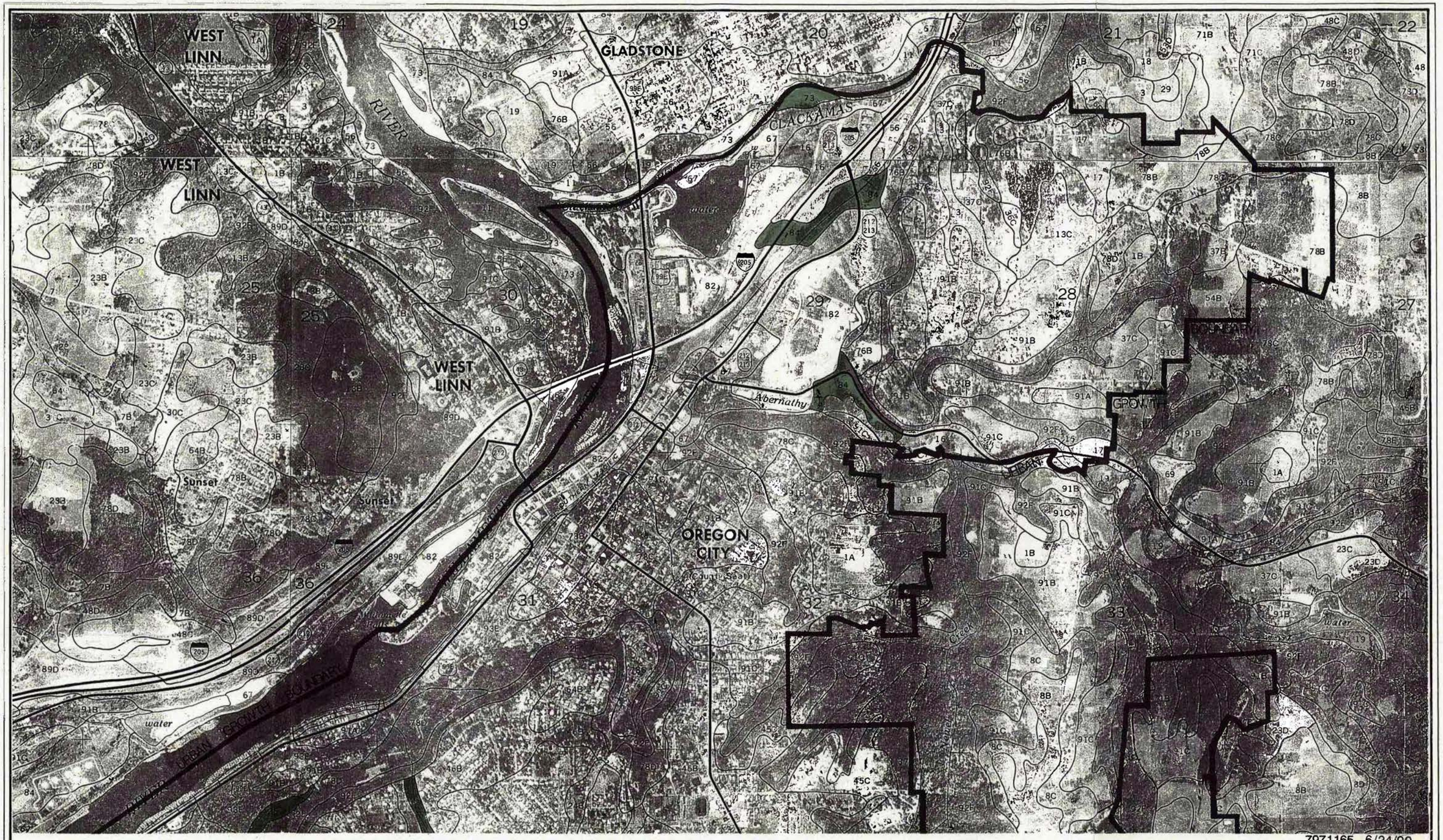


SOUTHERN HALF

Hydric soil mapping units within the Oregon City Local Wetlands study area, Oregon (Soil Conservation Servie, *Soil Survey of Clackamas County, Oregon*, 1:20000, 1985.)

FIGURE 4b

SHAPIRO & ASSOCIATES, INC.



NORTHERN HALF

Hydric soil mapping units within the Oregon City Local Wetlands study area, Oregon (Soil Conservation Servie, *Soil Survey of Clackamas County, Oregon*, 1:20000, 1985.

FIGURE 4a

SHAPIRO & ASSOCIATES, INC.

Table 4. Summary of Oregon Freshwater Wetland Assessment Methodology (OFWAM) Results for City of Oregon City

Wetland Code	OFWAM Assessment Elements: Functions (F) and Conditions (C)									
	Wildlife Habitat (F)	Fish Habitat Streams (F)	Fish Habitat Lakes/Ponds (F)	Water Quality (F)	Hydrologic Control (F)	Education (F)	Recreation (F)	Enhancement Potential (C)	Aesthetic Quality (C)	Impact Sensitivity (C)
AB-2	Provides Limited	N/A	N/A	Impacted	Intact	Inappropriate	Inappropriate	Moderate	Moderately Pleasing	Moderate
AB-3	Provides Limited	N/A	N/A	Not Present	Not Present	Inappropriate	Inappropriate	Moderate	Moderately Pleasing	Moderate
AB-4	Provides Limited	N/A	N/A	Impacted	Not Present	Potential	Potential	Moderate	Moderately Pleasing	Moderate
AC-1	Provides Limited	N/A	N/A	Impacted	Impacted	Inappropriate	Potential	Moderate	Moderately Pleasing	Moderate
AC-2	Provides Limited	N/A	N/A	Impacted	Intact	Inappropriate	Potential	Moderate	Moderately Pleasing	Moderate
AC-3	Provides Diverse	N/A	N/A	Impacted	Intact	Potential	Can Provide	N/A	Moderately Pleasing	Moderate
AC-4	Provides Limited	N/A	N/A	Intact	Impacted	Potential	Potential	Moderate	Moderately Pleasing	Moderate
CA-1	Provides Limited	N/A	N/A	Impacted	Intact	Can Provide	Potential	Moderate	Moderately Pleasing	Moderate
CA-2a,b,c,d	Provides Limited	Impacted	N/A	Intact	Intact	Can Provide	Potential	Moderate	Moderately Pleasing	Moderate
CA-3	Provides Limited	N/A	Impacted	Impacted	Intact	Potential	Inappropriate	Moderate	Moderately Pleasing	Moderate
CA-4	Provides Diverse	Impacted	N/A	Not Present	Intact	Inappropriate	Inappropriate	N/A	Moderately Pleasing	Moderate
CA-5	Provides Limited	N/A	N/A	Intact	Intact	Potential	Potential	Moderate	Moderately Pleasing	Moderate
CA-6a,b	Provides Limited	Impacted	N/A	Impacted	Intact	Inappropriate	Potential	Low	Moderately Pleasing	Moderate
CA-6c,d,e	Provides Limited	Impacted	N/A	Intact	Impacted	Potential	Inappropriate	Moderate	Moderately Pleasing	Moderate
CA-7a,b	Provides Limited	N/A	N/A	Impacted	Impacted	Inappropriate	Inappropriate	Moderate	Moderately Pleasing	Moderate
CL-1	Provides Limited	N/A	N/A	Impacted	Not Present	Potential	Inappropriate	Low	Moderately Pleasing	Low
CL-2	Provides Limited	N/A	Impacted	Impacted	Intact	Potential	Can Provide	Moderate	Moderately Pleasing	Moderate
CL-3	Provides Limited	N/A	N/A	Intact	Intact	Inappropriate	Potential	Moderate	Not Pleasing	Moderate
CL-4	Provides Limited	N/A	N/A	Impacted	Intact	Potential	Potential	Moderate	Moderately Pleasing	Moderate
CO-1a,b,c,d,e	Provides Limited	Impacted	N/A	Impacted	Intact	Potential	Potential	Moderate	Moderately Pleasing	Moderate
CO-3	Provides Limited	Impacted	Impacted	Impacted	Impacted	Can Provide	Potential	Moderate	Moderately Pleasing	Moderate

Note: N/A = Not applicable for this wetland

Table 4. Summary of Oregon Freshwater Wetland Assessment Methodology (OFWAM) Results for City of Oregon City

Wetland Code	OFWAM Assessment Elements: Functions (F) and Conditions (C)									
	Wildlife Habitat (F)	Fish Habitat Streams (F)	Fish Habitat Lakes/Ponds (F)	Water Quality (F)	Hydrologic Control (F)	Education (F)	Recreation (F)	Enhancement Potential (C)	Aesthetic Quality (C)	Impact Sensitivity (C)
CO-4	Provides Limited	N/A	N/A	Impacted	Intact	Potential	Potential	Moderate	Moderately Pleasing	Moderate
CP-1a,b	Provides Limited	N/A	N/A	Impacted	Impacted	Potential	Potential	Low	Moderately Pleasing	Moderate
CP-2	Provides Limited	N/A	N/A	Impacted	Impacted	Inappropriate	Inappropriate	Moderate	Moderately Pleasing	Moderate
CP-3	Provides Limited	Impacted	N/A	Impacted	Intact	Inappropriate	Inappropriate	Moderate	Moderately Pleasing	Moderate
FO-1	Provides Limited	N/A	N/A	Not Present	Impacted	Potential	Inappropriate	Moderate	Moderately Pleasing	Moderate
LI-2	Provides Diverse	N/A	N/A	Intact	Intact	Inappropriate	Inappropriate	N/A	Moderately Pleasing	Moderate
LI-3	Provides Limited	Impacted	N/A	Not Present	Not Present	Inappropriate	Potential	Moderate	Moderately Pleasing	Moderate
LI-4a,b	Provides Limited	Impacted	N/A	Impacted	Impacted	Inappropriate	Inappropriate	Moderate	Moderately Pleasing	Moderate
LI-5	Provides Limited	Impacted	N/A	Not Present	Not Present	Potential	Potential	Moderate	Moderately Pleasing	Moderate
MU-1	Provides Limited	N/A	N/A	Intact	Impacted	Inappropriate	Potential	Moderate	Moderately Pleasing	Moderate
MU-2	Provides Limited	N/A	N/A	Intact	Impacted	Potential	Potential	Moderate	Moderately Pleasing	Moderate
MU-3	Provides Limited	N/A	N/A	Intact	Impacted	Can Provide	Potential	Low	Moderately Pleasing	Moderate
MU-4	Provides Limited	N/A	N/A	Impacted	Impacted	Potential	Can Provide	Low	Moderately Pleasing	Moderate
MU-5	Provides Limited	N/A	N/A	Intact	Intact	Inappropriate	Inappropriate	Low	Moderately Pleasing	Moderate
MU-6	Provides Limited	N/A	Impacted	Intact	Intact	Inappropriate	Inappropriate	Moderate	Moderately Pleasing	Moderate
MU-8	Provides Limited	N/A	N/A	Impacted	Impacted	Potential	Inappropriate	Low	Moderately Pleasing	Moderate
NE-1	Provides Limited	Impacted	N/A	Impacted	Impacted	Inappropriate	Inappropriate	Moderate	Moderately Pleasing	Moderate
NE-2	Provides Limited	N/A	N/A	Impacted	Impacted	Potential	Potential	Low	Moderately Pleasing	Moderate
NE-3	Provides Limited	N/A	N/A	Intact	Intact	Potential	Potential	Low	Moderately Pleasing	Moderate
NE-5	Provides Limited	N/A	Impacted	Impacted	Impacted	Inappropriate	Potential	Moderate	Moderately Pleasing	Moderate
NE-8	Provides Limited	Impacted	N/A	Impacted	Intact	Inappropriate	Inappropriate	Low	Moderately Pleasing	Moderate
NE-9	Provides Diverse	N/A	Intact	Impacted	Intact	Can Provide	Can Provide	Moderate	Moderately Pleasing	Moderate

Note: N/A = Not applicable for this wetland

Table 4. Summary of Oregon Freshwater Wetland Assessment Methodology (OFWAM) Results for City of Oregon City

Wetland Code	OFWAM Assessment Elements: Functions (F) and Conditions (C)									
	Wildlife Habitat (F)	Fish Habitat Streams (F)	Fish Habitat Lakes/Ponds (F)	Water Quality (F)	Hydrologic Control (F)	Education (F)	Recreation (F)	Enhancement Potential (C)	Aesthetic Quality (C)	Impact Sensitivity (C)
PP-1	Provides Limited	Impacted	N/A	Intact	Intact	Inappropriate	Potential	Moderate	Moderately Pleasing	Moderate
PP-2	Provides Limited	Intact	N/A	Intact	Intact	Inappropriate	Potential	Moderate	Moderately Pleasing	Moderate
PP-3	Provides Limited	Impacted	N/A	Impacted	Impacted	Inappropriate	Potential	Low	Moderately Pleasing	Moderate
PP-4	Provides Limited	Impacted	N/A	Impacted	Impacted	Can Provide	Potential	Moderate	Moderately Pleasing	Moderate
SE-1	Provides Limited	N/A	N/A	Impacted	Intact	Can Provide	Inappropriate	Moderate	Moderately Pleasing	Moderate
SE-2	Provides Limited	N/A	N/A	Intact	Intact	Inappropriate	Potential	Moderate	Moderately Pleasing	Moderate
SE-3	Provides Limited	Impacted	N/A	Intact	Intact	Potential	Inappropriate	Moderate	Moderately Pleasing	Moderate

Note: N/A = Not applicable for this wetland

4.3 Locally Significant Wetlands

Of the 50 wetlands mapped in the LWI, 8 are relatively unaltered by development and have fairly good buffers (AB-3, AC-3, AC-4, CA-5, CO-4, LI-5, NE-1, and NE-5). Fourteen wetlands are only partially altered by development or have only a partial buffer (AC-1, AC-2, CA-1, CA-4, CL-1, CL-2, CL-3, CP-2, LI-2, LI-4, MU-1, MU-6, SE-2, and SE-3). The remaining 28 wetlands are modified, developed to the wetland edge, or have a narrow buffer.

Thirty individual wetland sites or wetland complexes (64.4 acres) were determined to be locally significant based on the OFWAM analysis of significance (Table 5; Appendix E). These significant wetlands include wetlands within all but two basins (Forsythe and Thimble basins). Many of the significant wetlands rank at the highest level or are important for several functions.

Twenty-six of these wetlands are significant because they provide a high function for hydrologic control in the drainage basin. Their location in developed areas and floodplains and their ability to absorb floodwaters contribute to their importance for flood control.

Six of the significant wetlands are significant because of their potential to provide water quality functions in association with two water quality limited streams, the Willamette and Clackamas Rivers. The DEQ has listed these rivers as water quality limited.

Five wetlands serve important functions for fish and wildlife. Of these five wetlands, three provide diverse habitat for wildlife, one has intact fish habitat, and two either contain or are associated with habitat known to be used by state or federally listed wildlife or fish species.

Three wetlands are within dedicated natural parks or educational facilities, and one is known to be a mitigation site.

Abernethy Creek (AB1) and the golf course water hazards (TH-1, in Thimble Basin) were not included in the significance analysis. Abernethy Creek is considered to be a jurisdictional water-of-the-state, but not a wetland. The water hazards were excavated from non-hydric soil, are unvegetated, and are likely not jurisdictional wetlands.

5.0 RIPARIAN FINDINGS

5.1 Riparian Assessment Areas

The riparian inventory and assessment was conducted adjacent to the mainstem of Abernethy Creek and one segment of Newell Creek using the procedures in the Riparian Guide (see section maps). These riparian areas were chosen for several reasons. The streams are the largest in the UGB and contain anadromous fish. The riparian areas adjacent to the streams contain the broadest extent of woody riparian vegetation. These factors will be important in the development of protection strategies for these streams. Other streams within the inventory area are not fish-bearing and have only partially existing riparian areas; therefore, it was determined that applying the Riparian Guide in these areas would be inappropriate. The riparian areas on each side of the streams were divided

Table 5. Significant Wetlands and Wetlands of Special Interest for Protection

Wetland Code	Results of Local Wetland Significance Assessment	Results of Wetlands of Special Interest for Protection Assessment
AB-2	• Wetland scores the highest rank for Hydrologic Control.	
AC-1	• Wetland is rated in either the highest or second highest category for water quality AND borders a water quality limited stream as listed by DEQ.	
AC-2	• Wetland scores the highest rank for Hydrologic Control. • Wetland is rated in either the highest or second highest category for water quality AND borders a water quality limited stream as listed by DEQ.	
AC-3	• Wetland scores the highest rank for Wildlife Habitat. • Wetland scores the highest rank for Hydrologic Control. • Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.	• Canemah Bluffs (Metro Greenspace)
AC-4	• Wetland is specifically protected as a wetland resource in a recognized federal, state, or local management plan, e.g., for a park, refuge, or scenic river.	• Canemah Bluffs (Metro Greenspace)
CA-1	• Wetland scores the highest rank for Hydrologic Control.	
CA-2	• Wetland scores the highest rank for Hydrologic Control.	• Protected mitigation site
CA-3	• Wetland scores the highest rank for Hydrologic Control.	
CA-4	• Wetland scores the highest rank for Hydrologic Control.	
CA-5	• Wetland scores the highest rank for Water Quality. • Wetland scores the highest rank for Hydrologic Control.	
CA-6a	• Wetland scores the highest rank for Hydrologic Control.	
CL-2	• Wetland scores the highest rank for Hydrologic Control. • Wetland is rated in either the highest or second highest category for water quality AND borders a water quality limited stream as listed by DEQ.	
CL-3	• Wetland scores the highest rank for Hydrologic Control.	
CL-4	• Wetland scores the highest rank for Hydrologic Control. • Wetland is rated in either the highest or second highest category for water quality AND borders a water quality limited stream as listed by DEQ.	
CO-1	• Wetland scores the highest rank for Hydrologic Control. • Wetland is rated in either the highest or second highest category for water quality AND borders a water quality limited stream as listed by DEQ.	
CO-3	• Wetland is rated in either the highest or second highest category for water quality AND borders a water quality limited stream as listed by DEQ.	
CO-4	• Wetland scores the highest rank for Hydrologic Control.	
CP-3	• Wetland scores the highest rank for Hydrologic Control.	
LI-2	• Wetland scores the highest rank for Wildlife Habitat. • Wetland scores the highest rank for Hydrologic Control.	
MU-5	• Wetland scores the highest rank for Hydrologic Control.	
MU-6	• Wetland scores the highest rank for Hydrologic Control.	

Table 5. Significant Wetlands and Wetlands of Special Interest for Protection, continued

Wetland Code	Results of Local Wetland Significance Assessment	Results of Wetlands of Special Interest for Protection Assessment
NE-1	• Inhabited by species listed by federal or state government as sensitive, threatened or endangered.	• Coho salmon, steelhead
NE-3	• Wetland scores the highest rank for Hydrologic Control.	
NE-8	• Wetland scores the highest rank for Hydrologic Control.	
NE-9	• Wetland scores the highest rank for Wildlife Habitat. • Wetland scores the highest rank for Fish Habitat. • Wetland scores the highest rank for Hydrologic Control. • Wetland is specifically protected as a wetland resource in a recognized federal, state, or local management plan, e.g., for a park, refuge, or scenic river.	• Painted turtle • John Inskeep Environmental Learning Center
PP-1	• Wetland scores the highest rank for Hydrologic Control.	
PP-2	• Wetland scores the highest rank for Hydrologic Control.	
SE-1	• Wetland scores the highest rank for Hydrologic Control.	
SE-2	• Wetland scores the highest rank for Hydrologic Control.	
SE-3	• Wetland scores the highest rank for Hydrologic Control.	

into reaches based on various characteristics, such as the type of development (or lack thereof) adjacent to the stream and the species of tree dominating the area. Each segment or riparian reach was coded as to the side of the stream (looking downstream; right side [R] and left side [L]) and its sequential number, with number 1 being the most upstream. On Abernethy Creek, two reaches were evaluated on both the left and right sides. On Newell Creek, one reach was evaluated on each side. The width of each riparian area reach was determined by the PTH (as listed in the Riparian Guide) of the dominant tree species growing in it.

5.2 Riparian Characterization and Results

Only two tree species dominate the inventoried riparian areas. The species and their PTH are bigleaf maple (90 feet) and Oregon ash (75 feet). Therefore, the assigned widths of the reaches varied from 75 feet to 90 feet, depending on the dominant tree species. The actual widths of existing riparian areas, which are the vegetated buffers that are not maintained as landscape or agriculture, varied from a minimum of 25 feet on some reaches of Abernethy Creek and to the full width of the riparian area as determined by the PTH on Newell Creek reaches. This broad variation in the width and quality of the riparian reaches (summarized in Table 6) is not surprising because of the extensive historical alteration of the stream corridors. These widths are reported for informational purposes to assist in writing ordinances addressing riparian buffers.

Abernethy Creek

The first riparian reach on both the left and right sides of Abernethy Creek is relatively intact. The right reach is 5,280 feet long, while the left reach is 9,000 feet long. The dominant tree on both of these reaches is Oregon ash. The riparian area width as determined by PTH is 75 feet. The width of the existing vegetated buffer is estimated to be as great as 800 feet in some areas. Topography in this reach includes floodplains and hillsides that rise steeply from the stream, both on the left and right reaches.

The functional assessment results indicate that these reaches are functioning at the highest level for water quality, flood management, thermal regulation, and wildlife habitat.

The second reach on both sides of Abernethy Creek has been affected significantly by development. The right reach is 4,750 feet long, and the left reach is 1,050 feet long. The dominant tree on the left reach is bigleaf maple, giving a riparian width by PTH of 90 feet. Oregon ash dominates the right side, providing a riparian width by PTH of 75 feet. The existing vegetated buffer is as narrow as 25 feet for most of the length of these reaches. Residential, commercial, and industrial development, roads, and parking lots fill most of the riparian area as determined by PTH.

The functional assessment results indicate that these reaches are functioning at the highest level for water quality and thermal regulation, and at a medium level for flood management and wildlife habitat.

Table 6. Oregon City Urban Riparian Inventory and Assessment Summary

Reach Code	Potential Tree Height (ft)	Actual Riparian Width (ft)	Length Of Reach (ft)	Water Quality Function	Flood Management Function	Thermal Regulation Function	Wildlife Habitat Function
ABL-1	75	75	9000	High	High	High	High
ABL-2	90	25	1050	High	Med	High	Med
ABR-1	75	75	5280	High	High	High	High
ABR-2	75	25	4750	High	Med	High	Med
NEL-1	90	90	1600	High	High	High	High
NER-1	90	90	1600	High	High	High	High

Newell Creek

The segment of Newell Creek that was evaluated is from the intersection of Highway 213 and Beavercreek Road to the UGB northwest of the intersection. This 1,600-foot-long segment is in a steep canyon. The dominant tree on both sides of the creek is bigleaf maple, which gives a riparian width of 90 feet as determined by PTH. Other trees in the riparian area and surrounding vegetated buffer include western redcedar and red alder. The vegetated buffer along both the left and right reaches exceeds the PTH, is undeveloped, and retains significant natural characteristics.

The functional assessment results indicate that these reaches are functioning at the highest level for water quality, flood management, thermal regulation, and wildlife habitat.

Other Streams

Caufield Creek, Coffee Creek, Livesay Creek, Mud Creek, Singer Creek, and other unnamed streams and small tributaries within the basins were not assessed using the riparian guide. The stream and riparian conditions were recorded on the wetland or stream summary sheets, and the wetland functions were assessed using OFWAM and the locally significant wetland criteria (Sections 4.2 and 4.3). Many small streams in the level, developed areas have narrow or no riparian buffers. In areas of steep terrain and less development, riparian areas adjacent to these streams are intact and functioning at the highest level.

6.0 SUMMARY

Oregon City's Goal 5 wetland resource inventory has been completed in compliance with guidance from the DSL that governs LWIs. The resulting maps are more complete and of greater resolution and accuracy than the 1982/1993 wetland inventory (Yellow Dot Map) or NWI maps that were previously used by the City to determine the location of possible wetlands. The inventory is a tool that can be used by the City to make informed planning decisions.

Fifty individual wetlands or wetland systems, totaling 78.2 acres, were identified by the LWI. The largest single mapped wetland complex is 21.1 acres. Wetlands inventoried are palustrine forested (PFO), palustrine emergent (PEM), palustrine scrub/shrub (PSS), palustrine open water (POW), and riverine (RSB). The majority (40%) of wetland acreage mapped in the inventory is PFO wetland. Small amounts of these wetlands are located in all but four of the basins. Many of these wetlands are associated with streams, and may experience some degree of inundation during the winter and early part of the growing season.

PEM wetlands comprise the second largest category of mapped wetlands (29% of the total). The largest amount of these wetlands is in the Caufield basin. These wetlands are located in all but two of the basins.

Thirty wetlands (64.4 acres) were determined to be locally significant. These significant wetlands include wetlands within all but two basins (Forsythe and Thimble). Twenty-six of these wetlands are significant because they provide a high function for hydrologic control within the drainage

basin. In addition to hydrologic control, six of the significant wetlands are significant also because of their water quality functions. Six wetlands provide diverse habitat for wildlife, have intact fish habitat, or are known to have state or federally listed wildlife species. Four wetlands are dedicated as parks or mitigation sites.

The riparian corridor assessment along Abernethy Creek resulted in a determination of two reaches on both the left and right sides, the longest being approximately 9,000 feet long. The width of each reach was determined by existing vegetation, and varied from 75 to 90 feet. In the lower reaches, actual riparian vegetation and function were almost completely gone. The upper reaches contain significant vegetation, natural value, and are functioning highly.

On Newell Creek, one 1,600 foot reach was evaluated on each side of one segment of the stream. The riparian area is intact, is functioning at its highest level, and was determined by existing vegetation to be 90 feet wide.

Many of the wetlands, streams, and riparian areas within Oregon City's UGB have been affected significantly by development, whether residential, commercial, industrial, or agricultural. There are also wetlands that have had minimal impact from development and are functioning at a high level. Each of the wetlands, streams, and riparian areas within the study area still serves important functions associated with fish and wildlife habitat, water quality, hydrologic control, and quality of life.

7.0 REFERENCES

Baker, M. Steven (programmer) and Forsberg, Brent O. (database manager). 1994. Oregon Rivers Information System. Digital database; Oregon Department of Fish and Wildlife, Portland, Oregon.

City of Oregon City. 1982. Inventory of Water Resources. Oregon City, Oregon.

City of Oregon City. 1997. Map of Surface Water Management Basins. Oregon City, Oregon.

City of Oregon City. 1997. Topographic Map including Oregon City Urban Growth Boundary. 2-foot contours; 1' = 400'. Oregon City, Oregon.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. Larse. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, Office of Biological Services, FWS/OBS-79/31. 103pp.

Federal Interagency Committee for Wetland Delineation. 1989. Federal Manual for Identifying and Delineating Jurisdictional Wetlands. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S.D.A. Soil Conservation Service, Washington, D.C. Cooperative technical publication. 76 pp. plus appendices.

Franklin, Jerry F., and C. T. Dyrness. 1973. Natural Vegetation of Oregon and Washington. U.S. Forest Service General Technical Report PNW-8.

Johannessen, Carl L., 1971. The Vegetation of the Willamette Valley. Annals of the Association of American Geographers. 61(2): 286-302

Levine, C., ed. 1996. Oregon Blue Book. Secretary of State, Salem, Oregon.

Oregon Department of Environmental Quality. 1998. Oregon's 1998 Section 303(d) List of Water Quality Limited Waterbodies (Public Comment Draft), Portland, Oregon.

Otak, Incorporated. 1993. City of Oregon City Wetland Site Inventory, Oregon City, Oregon.

Pacific Habitat Services, Inc. 1998. Urban Riparian Inventory and Assessment Guide. Oregon Division of State Lands, Salem, Oregon.

Reed, Porter B., Jr. 1988. National List of Plant Species That Occur in Wetlands: Northwest (Region 9). Prepared by the U.S. Fish and Wildlife Service, St. Petersburg, Florida. NERC-88/18.37.

Reed, Porter B., Jr. 1993. List of Plant Species that Occur in Wetlands (Region 9): 1993 Supplement. Washington D.C.

Roth, Emily, et al. 1996. Oregon Freshwater Wetland Assessment Methodology. Revised edition. Oregon Division of State Lands.

U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetland Delineation Manual. Environmental Laboratory. Technical Report 4-87-1.

U.S. Department of Housing and Urban Development. 1980. Federal Emergency Management Agency (FEMA) National Flood Insurance Program Flood Insurance Rate Map (FIRM) City of Oregon City, Oregon, Clackamas County. Panel Number 410021 0001 B.

U.S. Department of Housing and Urban Development. 1987. Federal Emergency Management Agency (FEMA) National Flood Insurance Program Flood Insurance Rate Map (FIRM), Clackamas County, Oregon (Unincorporated Areas). Panel Numbers 415588 0135, 415588 0140, and 415588 0155.

U.S. Fish and Wildlife Service, National Wetlands Inventory, 1981. Canby, Gladstone, and Oregon City, Oregon. CIR aerial photography, overlaid on USGS 7.5-minute quadrangle.

U.S. Geological Survey, 1961. Canby, Gladstone, and Oregon City, Oregon, 7.5-minute quadrangle topographic maps, photorevised 1985, 1984, and 1985, respectively.

U.S.D.A. Soil Conservation Service. 1985. Soil Survey of Clackamas County Area, Oregon.

U.S.D.A. Soil Conservation Service. 1989. Oregon Hydric Soils by Counties.



Appendix A

Wetland Data and Summary Sheets
(organized by drainage basin and wetland code)

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/3/97, 7/21/98

Wetland Mapping Code: AB-2

Investigator(s): DC/CM/KC/PO

Size (acres): 1.3

Data Sheet Numbers: 17, 39

Location

Legal: T2S R2E S28, 29

Other: NE of intersection of Redland and Livesay Roads

Basin: Abernethy Creek

Soils

Mapped Series: 16, 91C, 92F

Hydrology

Hydrologic Source: Surface water; groundwater

Wetland Classification(s): PEM, PFO

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia	*Cytisus scoparius*		*Juncus effusus*
Alnus rubra	*Rosa pisocarpa*		*Scirpus microcarpus*
Pseudotsuga menziesii			*Eleocharis palustris*
			Lotus corniculatus
			Eleocharis ovata
			Veronica americana
			Epilobium watsonii
			Rumex conglomeratus

Comments:

This wetland is one of the highest quality wetlands observed during the course of the field investigations. It has a high diversity of emergent vegetation with a fringe of 20- to 50-foot-tall Oregon ash (Fraxinus latifolia) on the western end. Channeled areas are well interspersed with open water areas. The surface soil has a very high organic matter content. Although the vegetation was too overgrown for visual verification, the wetland is probably drained by a culvert beneath Redland Road in the southwestern portion of the wetland.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: AB-2 Plot: 17

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Northeast of intersection of Redland and Livesay Roads.

Project #: 7971165 Determined by: DC/CM Date: 7/3/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover: 100**
Scirpus microcarpus	OBL	25
Juncus effusus	FACW	25
Lotus corniculatus	FAC	20
Eleocharis ovata	OBL	10
Veronica americana	OBL	10
Eleocharis palustris	OBL	10
Epilobium watsonii	FACW	5

Shrub/Sapling Stratum - % total cover: **0** (Ind. %Cover:)

Woody Vine Stratum - % total cover: **0**

Tree Stratum - % total cover: **0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 3 of 3 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Chehalis silt loam

Drainage Class: Well drained

Taxonomy: Fine-silty, mixed, mesic Cumulic Ultic Haploxeroll

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"	10 YR 3/2		Muck

☐ Histosol ☑ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking

☑ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☑ Sulfidic odor ☐ Gleyed ☑ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation 1" Depth to water table: Surface Depth to saturation: Surface

Primary Indicators:

☑ Inundated

☑ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☑ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: AB-2 Plot: 39

T 2S R 2E S 28/29 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Enclosed basin low laying area by road. N of Redland Rd./Hwy 213

Project #: 7971165 Determined by: KC/PO Date: 7/21/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover: 100**
Lotus corniculatus	FAC	30
Scirpus microcarpus	OBL	30
Juncus effusus	FACW	20
Rumex conglomeratus	FACW	5
Epilobium watsonii	FACW	5

Shrub/Sapling Stratum - % total cover: **0** (Ind. %Cover:)

Woody Vine Stratum - % total cover: **0**

Tree Stratum - % total cover: **0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) **3** of **3** = **100** % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Chehalis silt loam
Drainage Class: Deep, well drained
Taxonomy: Fine-silty, mixed, mesic Cumulic Ultic Haploxerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18	10 YR 3/1	no mottles	Clayey silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: Surface Depth to saturation: Surface

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12"
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☑ Drainage patterns

Secondary Indicators (2 or more required):
- ☐ Oxidized rhizospheres
- ☐ Water-stained leaves
- ☐ Recorded data (aerials, groundwater data)
  Explain:
- ☐ Other
  Explain:
- ☐ Local soil survey data
- ☐ FAC-Neutral test

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	6/21/97, 7/16/98	Investigator(s):	DC/CM, KC/PO
Project Name:	City of Oregon City		
WetlandCode:	AB-2	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	C	Q1:		Q1:		Q1:	C	Q1:	A	Q1:	B
Q2:	C	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	C	Q4:	A
Q5:	B	Q5:		Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	B	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	A										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	C	Q1:	C
Q2:	B	Q2:	A	Q2:	C	Q2:	A
Q3:		Q3:	B	Q3:	C	Q3:	A
Q4:	B	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AB-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with 5 or fewer plant species. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland not connected to other wetlands, but within 3 mile radius of other wetlands. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Groundwater (including seeps and springs) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Waterflow out of wetland is unrestricted. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential		

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AB-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is groundwater, including springs and seeps. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 8/14/97

Wetland Mapping Code: AB-3

Investigator(s): CM/DC

Size (acres): 0.8

Location

Legal: TS R2E S28

Other: Slump area N of Abernethy Creek near Holly Lane

Basin: Abernethy Creek

Soils

Mapped Series: 16

Hydrology

Hydrologic Source: Groundwater

Wetland Classification(s): PEM, PFO

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Alnus rubra	*Rubus spectabilis*	*Rubus discolor*	*Urtica dioica*
			Stachys cooleyae
			Equisetum hyemale

Comments:

The wetland is a large hillside slump/seep. Water flows over a cliff and saturates a narrow terrace along Abernethy Creek. The site is forested with a scrub/shrub understory.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: AB-3 Plot: 18

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Large slump area north of Abernethy Creek near Holly Lane.

Project #: 7971165 Determined by: DC/CM Date: 7/3/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

		Ind.	%Cover:
Herb Stratum - % total cover:			**60**
Urtica dioica		FAC+	34
Stachys cooleyae		FACW	33
Equisetum hyemale		FACW	33
Woody Vine Stratum - % total cover:			**10**
Rubus discolor		FACU	100
Shrub/Sapling Stratum - % total cover:			**30**
Rubus spectabilis		FAC+	100
Tree Stratum - % total cover:			**0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 5 = 80 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Chehalis silt loam

Drainage Class: Well drained

Taxonomy: Fine-silty, mixed, mesic Cumulic Ultic Haloxeroll

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-1"	10 YR 4/2		Fine silt
	1-18"	10 YR 3/1		Silty muck

☐ Histosol ☑ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☑ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 4" Depth to saturation: Surface

Primary Indicators:

☐ Inundated

☑ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☐ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	8/14/97	Investigator(s):	CM/DC
Project Name:	City of Oregon city		
WetlandCode:	AB-3	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:		Q1:		Q1:	C	Q1:	B	Q1:	B
Q2:	C	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	C	Q4:	C	Q4:	C
Q5:	A	Q5:		Q5:		Q5:	C	Q5:	C	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	C	Q6:	B
Q7:	A							Q7:	A		
Q8:	A										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	C	Q1:	C
Q2:	B	Q2:	B	Q2:	C	Q2:	C
Q3:		Q3:	B	Q3:	C	Q3:	A
Q4:	C	Q4:	C	Q4:	B	Q4:	A
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is lost or not present.
Hydrologic Control:	The wetland's hydrologic control function is lost or not present.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AB-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is lost or not present.	Groundwater (including seeps and springs) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Moderate (approx. 60%) degree of wetland vegetation cover. Less than 0.5 acre and wetland is not connected to other wetland within a 3 mile radius. Exclusive Forest use or Open Space within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is lost or not present.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Waterflow out of wetland is unrestricted. Emergent veg. or wet meadow is dominant cover type. Exclusive Forest Use or Open Space within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Exclusive Forest use or Open Space within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate	Wetland has lost one or more functions or

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AB-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
	potential for enhancement.	one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is groundwater, including springs and seeps. Wetland's area is less than 0.5 acre. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 2/27/98

Wetland Mapping Code: AB-4

Investigator(s): DC

Size (acres): 0.1

Location

Legal: T2S R2E S33

Other: SE of intersection of Brookfield & Brown Deer Dr.

Basin: Abernethy Creek

Soils

Mapped Series: 92C

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Salix sp.	*Alnus rubra*	*Rubus discolor*	*Juncus effusus*
Alnus rubra			

Comments:

DSL DET #98-0174. Wetland receives water from a ditch that runs along the western edge of the adjacent development. Soils consist of deep, highly organic muck and were saturated to the surface at the time of observation. Two-thirds of the wetland vegetation community are emergent (mostly common rush [Juncus effusus]), while the remainder is forested with red alder (Alnus rubra) and willow species (Salix scouleriana, Salix sp.). Blackberry (Rubus discolor) thickets dominate the northern portion. The wetland drains into a canyon to the NW and then to Abernethy Creek.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):		Investigator(s):	DC
Project Name:	City of Oregon City		
WetlandCode:	AB-4	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	C	Q2:		Q2:		Q2:	C	Q2:	C	Q2:	A
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	C	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	B										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	B	Q1:	A	Q1:	C
Q2:	A	Q2:	A	Q2:	C	Q2:	A
Q3:	A	Q3:	B	Q3:	C	Q3:	A
Q4:	C	Q4:	B	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	B	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is lost or not present.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AB-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. No evidence of flooding or ponding during the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is lost or not present.	No part of wetland located within 100-year floodplain or enclosed basin. No evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Waterflow out of wetland is unrestricted. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is being taken out of stream(s) through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AB-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is less than 0.5 acre. Between 10 and 40 % of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation, but allowed only with permission. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, but observation of other features can be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/20/98

Wetland Mapping Code: AC-1

Investigator(s): KC/PO

Size (acres): 2.9

Location

Legal: T3S R1E S1

Other: E of Hwy. 99E, NE of Willamette Pk., West Linn

Basin: Amanda Court

Soils

Mapped Series: 91B

Hydrology

Hydrologic Source: Groundwater; sheet flow

Wetland Classification(s): PFO, PSS, PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Populus trichocarpa	*Crataegus douglasii*	*Rubus discolor*	*Festuca arundinacea*
Fraxinus latifolia	*Salix lasiandra*		*Phalaris arundinacea*
Crataegus douglasii	*Salix sitchensis*		*Juncus effusus*
	Rosa nutkana		*Agrostis tenuis*
	Rosa pisocarpa		*Typha latifolia*

Comments:

This wetland is approximately 500 feet from Hwy. 99E in a low-lying area at the base of steep slopes to the east. The primary source of water for the wetland is seeps from the slopes and surface runoff. A berm has been constructed on the western border of the wetland, and an east-west berm bisects a portion of the wetland. The wetland outlet is probably a culvert to a wetland to the north, which eventually flows into the Willamette River through a culvert. Vegetative cover in the forested areas is very dense, providing good wildlife habitat. Open areas border the forested areas and are dominated by grasses and shrubs, providing foraging areas for a variety of wildlife. The steep, forested slopes to the east provide wildlife access to the wetland area.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: AC-1 Plot: 47

T 3S R 1E S 01 City: Oregon City County: Clackamas State: OR

Plot Location; Topography In broad depression, base of steep slope, E of Hwy 99.

Project #: 7971165 Determined by: DC/KC Date: 7/14/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover:** **30**	**Shrub/Sapling Stratum** - % total cover:		**Ind. %Cover:** **60**
Phalaris arundinacea	FACW	100	*Salix lasiandra*	FACW	70
Scirpus microcarpus	OBL	1	*Rosa pisocarpa*	FAC	10
Lemna minor	OBL	1			
Woody Vine Stratum - % total cover:		**0**	**Tree Stratum** - % total cover:		**0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 2 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Woodborn silt loam

Drainage Class: Well drained

Taxonomy: Fine-silty, mixed, mesic Aquatic Agrixeroll

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"	7.5YR 3/1	mottles abundant, coarse, 5YR 3/4	Clayey, silt loam, blocky

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 6" Depth to saturation: Surface

Primary Indicators:

☐ Inundated

☑ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☑ Drainage patterns

Secondary Indicators (2 or more required):

☑ Oxidized rhizospheres

☑ Water-stained leaves

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

☐ Local soil survey data

☐ FAC-Neutral test

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: AC-1 Plot: 48

T 3S R 1E S 01 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Broad swale at base of hill across river from W. Linn water treatment plant.

Project #: 7971165 Determined by: DC/KC Date: 7/14/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover: 95**
Eleocharis palustris	OBL	80
Festuca arundinacea	FAC-	5
Agrostis tenuis	FAC	5
Holcus lanatus	FAC	5
Agrostis stolonifera	FAC	5
Veronica americana	OBL	1

Shrub/Sapling Stratum - % total cover: **Ind. %Cover:**

Woody Vine Stratum - % total cover: **0**

Tree Stratum - % total cover: **0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 1 of 1 = **100** % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Woodburn silt loam
Drainage Class: Well drained
Taxonomy: Fine-silty, mixed, mesic Aquultic Argixeroll

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-6"	10 YR 4/2	mottles abundant, coarse, 10 YR 5/8	Clayey silt loam, high clay content
	6-18"	10 YR 5/1	mottles abundant, coarse, 7.5 YR 5/8	Cayey silt loam, high clay
	mixed	10 YR 4/2		

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☑ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Remarks: 6-18" mixed matrix

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: Surface

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☑ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:
☐ Local soil survey data
☐ FAC-Neutral test

Remarks: Edge of large pond area which contained water earlier in the year.

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/20/98	Investigator(s):	KC/PO
Project Name:	City of Oregon City		
WetlandCode:	AC-1	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:		Q1:	C	Q1:	A	Q1:	A
Q2:	C	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	B	Q3:		Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	B	Q4:	C
Q5:	A	Q5:		Q5:		Q5:	C	Q5:	C	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	C	Q6:	B
Q7:	A							Q7:	C		
Q8:	A										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	A	Q1:	B
Q2:	B	Q2:	A	Q2:	C	Q2:	B
Q3:		Q3:	B	Q3:	C	Q3:	A
Q4:	B	Q4:	C	Q4:	B	Q4:	A
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AC-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. or wet meadow. Moderate degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Groundwater (including seeps and springs) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Exclusive Forest use or Open Space within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Emergent veg. or wet meadow is dominant cover type. Exclusive Forest Use or Open Space within 500 ft of wetland on downstream or down-slope edge of wetland. Forested or natural area land use upstream.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Exclusive Forest use or Open Space within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AC-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is groundwater, including springs and seeps. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/20/98

Wetland Mapping Code: AC-2

Investigator(s): KC/PO

Size (acres): 1.1

Location

Legal: T3S R1E S1

Other: E of Hwy. 99E, NE of Willamette Pk., West Linn

Basin: Amanda Court

Soils

Mapped Series: 3, 92F

Hydrology

Hydrologic Source: Groundwater; sheet flow

Wetland Classification(s): PFO, PSS, PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia		*Rubus discolor*	*Phalaris arundinacea*

Comments:

This wetland is in a low-lying area between a road to the south, a fill area to the east, and development to the north and west. An inlet to the wetland was not found but probably exists in the form of a culvert from a wetland area and an associated ditch to the south. The outlet is an approximately 0.5-mile-long culvert to the Willamette River. The forested wetland provides habitat for a variety of wildlife, including song birds and small mammals. Open areas are dominated by reed canarygrass (Phalaris arundinacea), and edges are dominated by Himalayan blackberry (Rubus discolor).

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: AC-2 Plot: 46

T 3S R 1E S 01 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Low-lying area surrounded by fill, SE of Hwy 99E across from W. Linn water treatment plant

Project #: 7971165 Determined by: DC/KC Date: 7/14/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		**20**
Phalaris arundinacea	FACW	100
Woody Vine Stratum - % total cover:		**0**
Shrub/Sapling Stratum - % total cover:		**0**
Tree Stratum - % total cover:		**100**
Fraxinus latifolia	FACW	100

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 2 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Woodburn silt loam
Drainage Class: Well drained
Taxonomy: Fine-silty, mixed, mesic Aquultic Argixeroll

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-4	7.5 YR 3/2	mottles frequent, medium, gleyed, 5 Y 3/2	Clayey silt loam
	4-12	5 Y 3/1		Silty clay loam fine angular structure
	12-18	10 YR 3/1	mottles few, medium, 7.5 YR 3/4	Silty clay loam

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Remarks: Soil surface covered w/ algae. Fill to east and west.

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: 12"

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☑ Water marks
☐ Drift lines
☑ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☑ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:
☐ Local soil survey data
☐ FAC-Neutral test

Remarks: Moist - surface 12 surface.

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/20/98	Investigator(s):	KC/PO
Project Name:	City of Oregon City		
WetlandCode:	AC-2	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:		Q1:	C	Q1:	A	Q1:	B
Q2:	A	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	A
Q3:	B	Q3:		Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	A	Q1:	B
Q2:	B	Q2:	B	Q2:	C	Q2:	B
Q3:	C	Q3:	B	Q3:	C	Q3:	C
Q4:	B	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AC-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Woody vegetation is dominant vegetation cover. Moderate degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Groundwater (including seeps and springs) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is being taken out of stream(s) through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate	Wetland has lost one or more functions or

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AC-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
	potential for enhancement.	one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is groundwater, including springs and seeps. Water flow into wetland is restricted and cannot be restored. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/14/98

Wetland Mapping Code: AC-3

Investigator(s): DC/KC

Size (acres): 3.5

Location

Legal: T3S R1E S1

Other: Immediately S of Hwy. 99E; W of Canemah City Park

Basin: Amanda Court

Soils

Mapped Series: 93E

Hydrology

Hydrologic Source: Groundwater; sheet flow

Wetland Classification(s): PSS, PFO

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Salix scouleriana	*Spiraea douglasii*		*Lysichitum americanum*
Pseudotsuga menziesii	*Physocarpus capitatus*		*Carex obnupta*
Fraxinus latifolia	*Salix scouleriana*		*Phalaris arundinacea*
Alnus rubra	*Cornus sericea*		

Comments:

DSL DET #97-0039. Three forested wetland units are located at the base of a steep, forested slope to the south. They are fed by springs and seeps and collect sheet flow. A moderately sloped forest is to the north. This is an old water district impoundment, but has reverted to a high quality, natural state. More details are available in the delineation report.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/14/98	Investigator(s):	DC/KC
Project Name:	City of Oregon City		
WetlandCode:	AC-3	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams	Fish Habitat Lakes/Ponds	Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:	Q1:	Q1:	C	Q1:	A	Q1:	B
Q2:	A	Q2:	Q2:	Q2:	A	Q2:	A	Q2:	B
Q3:	B	Q3:	Q3:	Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:	Q4:	Q4:	B	Q4:	B	Q4:	C
Q5:	A	Q5:	Q5:	Q5:	C	Q5:	A	Q5:	A
Q6:	A	Q6:	Q6:	Q6:	C	Q6:	A	Q6:	A
Q7:	A					Q7:	C		
Q8:	A								
Q9a:									
Q9b:	A								

Enhancement Potential	Education		Recreation		Aesthetic Quality	
Q1:	Q1:	B	Q1:	A	Q1:	B
Q2:	Q2:	A	Q2:	C	Q2:	C
Q3:	Q3:	A	Q3:	C	Q3:	A
Q4:	Q4:	A	Q4:	A	Q4:	A
Q5a:	Q5:	A	Q5:	B	Q5:	A
Q5b:	Q6:	B	Q6:	B	Q6:	A
Q6:						

Wildlife Habitat:	The wetland provides diverse wildlife habitat.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	N/A
Education:	The wetland has potential for educational use.
Recreation:	The wetland provides recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AC-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides diverse wildlife habitat.	Two or more Cowardin wetland classes. Woody vegetation is dominant vegetation cover. Moderate degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Groundwater (including seeps and springs) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Exclusive Forest use or Open Space within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Forested or natural area land use upstream.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Exclusive Forest use or Open Space within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	N/A	

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AC-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation, but allowed only with permission. There are no visible hazards to the public at the wetland site. Results of wildlife habitat and fish habitat assessment criteria prove wetland provides diverse Wildlife Habitat, or Fish Habitat function is intact. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland provides recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides diverse wildlife habitat. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/14/98

Wetland Mapping Code: AC-4

Investigator(s): KC/DC

Size (acres): 0.8

Location

Legal: T3S R1E S1

Other: Immediately S of Hwy. 99E; W of Canemah City Park

Basin: Amanda Court

Soils

Mapped Series: 93E

Hydrology

Hydrologic Source: Precipitation; sheet flow

Wetland Classification(s): PEM, PFO, PSS

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Quercus garryana	*Spiraea douglasii*		*Carex obnupta*
Pseudotsuga menziesii	*Cornus sericea*		*Phalaris arundinacea*
Fraxinus latifolia			*Juncus effusus*

Comments:

DSL DET #97-0039. The wetland consists of four units, all depressions that collect groundwater. The largest (AC-4a) has been filled in the past by a syphon pipe from AC-3a and has an excavated drainage outlet that flows toward the Willamette River. This unit is mostly forested, with emergent understory and a PEM area along the eastern edge. The other small wetlands are PSS with no outlets. These wetlands are surrounded by a dry, upland forest and open fields. A number of unmaintained trails are in this area. More details are available in the delineation report.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/14/98	Investigator(s):	KC/DC
Project Name:	City of Oregon City		
WetlandCode:	AC-4	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:		Q1:		Q1:	B	Q1:	A	Q1:	A
Q2:	A	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	C	Q4:	C
Q5:	B	Q5:		Q5:		Q5:	C	Q5:	A	Q5:	A
Q6:	B	Q6:		Q6:		Q6:	C	Q6:	C	Q6:	A
Q7:	A							Q7:	C		
Q8:	A										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	B	Q1:	A	Q1:	B
Q2:	C	Q2:	A	Q2:	C	Q2:	A
Q3:		Q3:	B	Q3:	B	Q3:	A
Q4:	B	Q4:	A	Q4:	B	Q4:	A
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AC-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland not connected to other wetlands, but within 3 mile radius of other wetlands. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Precipitation or sheet flow is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Exclusive Forest use or Open Space within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Waterflow out of wetland is unrestricted. Woody vegetation is dominant cover type. Exclusive Forest Use or Open Space within 500 ft of wetland on downstream or down-slope edge of wetland. Forested or natural area land use upstream.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Exclusive Forest use or Open Space within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	AC-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is precipitation or sheet flow. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation, but allowed only with permission. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. Existing undeveloped trails and viewing ares to guide user. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/14/98

Wetland Mapping Code: CA-1

Investigator(s): JG/PO

Size (acres): 2.4

Location

Legal: T3S R2E S8

Other: W of intersection of Molalla Ave. & Hwy. 213

Basin: Caufield Creek

Soils

Mapped Series: 8C

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PEM, PSS

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia	*Symphoricarpos albus*	*Rubus discolor*	*Carex obnupta*
Crataegus monogyna			*Juncus bufonius*
			Holcus lanatus
			Polystichum munitum
			Geranium robertianum
			Geum macrophyllum

Comments:

DSL DET #96-0301, 96-0557. The wetland is composed of an Oregon ash (Fraxinus latifolia) woodland, wet pasture, and small stream with a series of culverts in the upper end.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: Oregon City Site: CA-1 Plot: 56

T 3S R 2E S 8 City: Oregon City County: Clackamas State: OR

Plot Location; Topography: Small triangle of open space at west end of new housing development, W of Mollala Ave./Hwy 213

Project #: 7971165 Determined by: JG/PO Date: 7/14/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:	Ind.	%Cover: 80
Alopecurus geniculatus	OBL	60
Ranunculus repens	FACW	20
Veronica americana	OBL	10
Galium aparine	FACU	5
Polygonum hydropiper	OBL	5
Epilobium watsonii	FACW	5

Shrub/Sapling Stratum - % total cover: 0 (Ind. %Cover:)

Woody Vine Stratum - % total cover:

Tree Stratum - % total cover: 0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 3 = 67 % (50/20 Rule)

Remarks: Vegetation recorded only w/ in banks of ditch. Outside of ditch Rubus discolor, Festuca arundinaceae, Holcus lanatus.

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Bornstedt silt loam

Drainage Class: Moderately well drained

Taxonomy: Fine-silty, mixed, mesic Typic Haploxerult

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-10	10 YR 3/2	mottles few, small, bright, concretions 0-8"	Silty loam
	10-16	10 YR 3/2		Very loose silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☑ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >16" Depth to saturation: >16"

Primary Indicators:

☐ Inundated

☐ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☑ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)
Explain:

☐ Other
Explain:

Remarks: Drainage patterns in bottom of ditch suggests evidence of flowing water.

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/14/98	**Investigator(s):**	JG/PO
Project Name:	City of Oregon City		
WetlandCode:	CA-1	**ProjectNumber:**	7971165

Wildlife Habitat		Fish Habitat Streams	Fish Habitat Lakes/Ponds	Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:	Q1:	Q1:	A	Q1:	B	Q1:	A
Q2:	C	Q2:	Q2:	Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:	Q3:	Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	Q4:	Q4:	B	Q4:	A	Q4:	A
Q5:	B	Q5:	Q5:	Q5:	A	Q5:	C	Q5:	A
Q6:	A	Q6:	Q6:	Q6:	C	Q6:	A	Q6:	B
Q7:	A					Q7:	A		
Q8:	C								
Q9a:									
Q9b:	B								

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	B	Q1:	C
Q2:	A	Q2:	A	Q2:	C	Q2:	B
Q3:	A	Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	B	Q4:	B	Q4:	B
Q5a:		Q5:	B	Q5:	B	Q5:	A
Q5b:	B	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has educational uses.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Moderate (approx. 60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Waterflow out of wetland is restricted or no outlet. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is less than 0.5 acre. Between 10 and 40 % of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has educational uses.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, but observation of other features can be made. There is an unmaintained access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is an unmaintained public access point within 250 feet of the wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/14/98

Wetland Mapping Code: CA-2

Investigator(s): JG/PO

Size (acres): 2.9

Location

Legal: T3S R2E S8

Other: N of Meyers Rd., SW of intersection of Mollalla Ave. & Hwy. 213

Basin: Caufield Creek

Soils

Mapped Series: 8C

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PEM, PSS

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Populus balsamifera		*Rubus discolor*	*Typha latifolia*
Alnus rubra			*Juncus effusus*

Comments:

DSL RF #6513. The wetland consists of four small sites in an apartment complex. Each site is fenced. Three sites with water have vegetative visual screens. There are small areas of open water, with low-flow rates estimated at 1-2 cfs. All sites have steep banks, with the wetland surface about 10 feet below the level of the surrounding area.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/14/98	Investigator(s):	JG/PO
Project Name:	City of Oregon City		
WetlandCode:	CA-2a,b,c,d	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:	C	Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	A	Q2:	C	Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:	B	Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	B	Q4:	C	Q4:	A
Q5:	B	Q5:	C	Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	A	Q6:	B	Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	C										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	B	Q1:	B
Q2:	A	Q2:	A	Q2:	C	Q2:	C
Q3:	A	Q3:	B	Q3:	C	Q3:	B
Q4:	B	Q4:	B	Q4:	B	Q4:	B
Q5a:		Q5:	B	Q5:	B	Q5:	A
Q5b:	C	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has educational uses.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-2a,b,c,d	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	Less than 50% of stream shaded by riparian vegetation. Physical character of stream channel extensively modified/piped. Stream contains between 10 and 25% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. Non-Salmonid, non-sensitive fish species present sometime during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Waterflow out of wetland is unrestricted. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-2a,b,c,d	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is between 0.5 and 5 acres. Less than 10% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has educational uses.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, but observation of other features can be made. There is an unmaintained access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is an unmaintained public access point within 250 feet of the wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors, which can be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/14/98 **Wetland Mapping Code:** CA-3

Investigator(s): JG/PO **Size (acres):** 2.1

Location

Legal: T3S R2E S9

Other: SW of intersection of Hwy. 213 & Meyers Rd.

Basin: Caufield Creek

Soils

Mapped Series: 24B

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): POW, PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Alnus rubra	*Corylus cornuta*	*Rubus discolor*	
Fraxinus latifolia	*Acer circinatum*	*Rubus ursinus*	
Salix sp.	*Physocarpus capitatus*		
Acer macrophyllum	*Spiraea douglasii*		
Salix lasiandra	*Oemleria cerasiformis*		

Comments:

OFF-SITE DETERMINATION. DSL DET. 96-0263. The wetland is a large pond bordered by small farm, highway, and apartment complex. The inlet to the pond is a culvert under the highway. Flow out of the pond is restricted by an earthen dam at the opposite end. A small stream, Caufield Creek, flows out of the pond through a red alder (Alnus rubra), bigleaf maple (Acer macrophyllum), Oregon ash (Fraxinus latifolia) woodland.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/14/98	Investigator(s):	JG/PO
Project Name:	City of Oregon City		
WetlandCode:	CA-3	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:		Q1:	A	Q1:	A	Q1:	A	Q1:	B
Q2:	B	Q2:		Q2:	C	Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:	B	Q3:	C	Q3:	B	Q3:	C
Q4:	B	Q4:		Q4:	A	Q4:	B	Q4:	A	Q4:	A
Q5:	A	Q5:		Q5:	C	Q5:	A	Q5:	B	Q5:	A
Q6:	A	Q6:		Q6:	A	Q6:	C	Q6:	A	Q6:	C
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	C	Q1:	C
Q2:	A	Q2:	A	Q2:	C	Q2:	A
Q3:	A	Q3:	B	Q3:	C	Q3:	A
Q4:	B	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	The wetland's fish habitat function is impacted or degraded.
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Emergent veg. & ponding or open water only. Low degree of Cowardin class interspersion. Between 0.5 and 1 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	The wetland's fish habitat function is impacted or degraded.	More than 75% of stream shaded by riparian vegetation. Physical character of stream channel extensively modified/piped. Stream contains between 10 and 25% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. Salmon, trout, or sensitive species present sometime during the year.
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Low (<60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Waterflow out of wetland is restricted or no outlet. Emergent veg. and ponding , or open water only is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. and ponding,or open water only are the dominant cover types.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/15/98 **Wetland Mapping Code:** CA-4

Investigator(s): JG/PO **Size (acres):** 5.1

Location

Legal: T3S R2E S9

Other: NE of intersection of Hwy. 213 & Glen Oak Rd.

Basin: Caufield Creek

Soils

Mapped Series: 24B

Hydrology

Hydrologic Source: Groundwater

Wetland Classification(s): PFO, PSS

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia	*Rosa pisocarpa*	*Rubus discolor*	*Juncus bufonius*
	Cornus sericea		*Ranunculus repens*
	Fraxinus latifolia	*Rubus laciniatus*	*Carex stipata*
	Symphoricarpos albus		*Carex deweyana*
	Rubus spectabilis		*Veronica americana*

Comments:

The wetland is in a very wet, muddy, Oregon ash (Fraxinus latifolia) woodland area. This area is heavily used by people and horses. Associated off-site vegetation includes (in order of abundance): common rush (Juncus effusus), velvet grass (Holcus lanatus), sawbeak sedge (Carex stipata), large-leaved avens (Geum macrophyllum), Cooley's hedge nettle (Stachys cooleyae), bracken fern (Pteridium aqulinum), and dewberry (Rubus ursinus).

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CA-4 Plot: 57

T 3S R 2E S 9 City: Oregon City County: Clackamas State: OR

Plot Location; Topography N end of wet forested area, S of CCC campus, N of Hwy 213.

Project #: 7971165 Determined by: JG/PO Date: 7/15/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? No

Are Soils ☐ Vegetation ☑ Hydrology ☐ significantly disturbed? Yes

Explanation: trampled and grazed by horses

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		**80**
Ranunculus repens	FACW	30
Juncus bufonius	FACW	30
Carex stipata	OBL	5
Veronica americana	OBL	5
Carex deweyana	FACU	5
Woody Vine Stratum - % total cover:		**25**
Rubus discolor	FACU	50
Rubus laciniatus	FACU	10

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		**25**
Rosa pisocarpa	FAC	80
Rubus spectabilis	FAC+	10
Cornus sericea	FACW	10
Symphoricarpos albus	FACU	10
Fraxinus latifolia	FACW	10
Tree Stratum - % total cover:		**80**
Fraxinus latifolia	FACW	90

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 5 = 80 % (50/20 Rule)

Remarks: Offsite vedetation (in order of abundance) Ju ef, Ho la, Ca st, GE ma, ST co, Pt ag, Ru ur.

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Cottrell silty clay loam
Drainage Class: Moderately well drained
Taxonomy: Clayey, mixed, mesic Aquic Haplohumult

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-12	10 YR 3/1	mottles common, large, bright (2.5 YR 3/3)	Clayey silt
	12-16	10 YR 3/1	mottles common, large	Silty clay

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: ~16" Depth to saturation: 10"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:
☐ Local soil survey data
☐ FAC-Neutral test

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CA-4 Plot: 58

T 3S R 2E S 9 City: Oregon City County: Clackamas State: OR

Plot Location; Topography N of plot #57 in drier more open unpland forest; S of CCC Campus.

Project #: 7971165 Determined by: JG/PO Date: 7/15/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:		Ind.	%Cover:
Herb Stratum - % total cover:		80	**Shrub/Sapling Stratum** - % total cover:		40
Vancouveria hexandra	UPL	40	*Acer circinatum*	FAC-	40
Fragaria virginiana	FACU	40	*Symphoricarpos albus*	FACU	20
Prunella vulgaris	FACU	10	*Alnus rubra*	FAC	20
		0	*Ilex aquifolium*	UPL	10
Woody Vine Stratum - % total cover:		40	**Tree Stratum** - % total cover:		100
Rubus discolor	FACU	80	*Alnus rubra*	FAC	40
Rubus laciniatus	FACU	10	*Pseudotsuga menziesii*	FACU	30
Rubus ursinus	FACU	10	*Fraxinus latifolia*	FACW	30

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 3 of 9 = 33 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Cottrell silty clay loam

Drainage Class: Moderately well drained

Taxonomy: Clayey, mixed, mesic Aquic Haplohumult

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-16	2.5 YR 3/4		Stony silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >16" Depth to saturation: >16"

Primary Indicators:

☐ Inundated

☐ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☐ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Hydrology Criterion Met? No

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	JG/PO
Project Name:	City of Oregon City		
WetlandCode:	CA-4	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:	A	Q1:		Q1:	C	Q1:	B	Q1:	A
Q2:	A	Q2:	A	Q2:		Q2:	C	Q2:	C	Q2:	B
Q3:	C	Q3:	B	Q3:		Q3:	A	Q3:	A	Q3:	C
Q4:	A	Q4:	A	Q4:		Q4:	A	Q4:	C	Q4:	C
Q5:	A	Q5:	A	Q5:		Q5:	C	Q5:	A	Q5:	A
Q6:	A	Q6:	B	Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	A										
Q9a:											
Q9b:	A										

Enhancement Potential	Education		Recreation		Aesthetic Quality	
Q1:	Q1:	C	Q1:	C	Q1:	C
Q2:	Q2:	A	Q2:	C	Q2:	C
Q3:	Q3:	A	Q3:	C	Q3:	A
Q4:	Q4:	C	Q4:	A	Q4:	B
Q5a:	Q5:	C	Q5:	B	Q5:	A
Q5b:	Q6:	B	Q6:	B	Q6:	A
Q6:						

Wildlife Habitat:	The wetland provides diverse wildlife habitat.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is lost or not present.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	N/A
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides diverse wildlife habitat.	Two or more Cowardin wetland classes. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. More than 1 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	More than 75% of stream shaded by riparian vegetation. Stream channel natural/returning to natural physical character. Stream contains between 10 and 25% of instream structures. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 ft of wetland edge. Non-Salmonid, non-sensitive fish species present sometime during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is lost or not present.	Groundwater (including seeps and springs) is wetland's primary source of water. No evidence of flooding or ponding during the growing season. High (>60%) degree of wetland vegetation cover. More than 5 acres of wetland area. Exclusive Forest use or Open Space within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. No evidence of flooding or ponding during the growing season. Area is more than 5 acres. Waterflow out of wetland is unrestricted. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Exclusive Forest use or Open Space within 500 feet of

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	N/A	
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Results of wildlife habitat and fish habitat assessment criteria prove wetland provides diverse Wildlife Habitat, or Fish Habitat function is intact. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides diverse wildlife habitat. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/15/98

Wetland Mapping Code: CA-5

Investigator(s): JG/PO

Size (acres): 7

Location

Legal: T3S R2E S9

Other: SE of CCC campus, NE of Hwy. 213 & Glen Oak Rd.

Basin: Caufield Creek

Soils

Mapped Series: 8B

Hydrology

Hydrologic Source: Precipitation; sheet flow

Wetland Classification(s): PFO

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia	*Rosa nutkana*	*Rubus ursinus*	*Carex unilateralis*
Quercus garryana	*Fraxinus latifolia*	*Rubus laciniatus*	*Holcus lanatus*
Pseudotsuga menziesii	*Rosa pisocarpa*		*Festuca arundinacea*
	Symphoricarpos albus		*Hypericum perforatum*
	Crataegus monogyna		*Agrostis stolonifera*
	Rhamnus purshiana		*Juncus effusus*
	Holodiscus discolor		*Rumex crispus*
	Corylus cornuta		*Camassia quamash*
	Rhus diversiloba		*Prunella vulgaris*
			Rumex conglomeratus
			Geum macrophyllum
			Carex deweyana
			Carex densa
			Polystichum munitum
			Galium aparine
			Tellima grandiflora

Comments:

This wetland is in a large woodland that is bordered on the northwest by the CCC campus, on the north by private land, and on the south by agricultural/open land. It is bordered on the west by private land that appears to be excavated and drained (a 3-foot-deep ditch runs along the border of this property). Wetland areas are primarily Oregon ash (Fraxinus latifolia) woodland, bordered by Oregon white oak (Quercus garryana) and Douglas-fir (Pseudotsuga menziesii) woodland. The understory is quite dense in places, less so in others. Sheep were observed grazing at the western end of the woodland.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CA-5 Plot: 59

T 3S R 2E S 9 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Forested arm on E side of NE end of forested wetland; S of CCC Campus.

Project #: 7971165 Determined by: JG/PO Date: 7/15/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		Ind.	%Cover: 60
Carex unilateralis		FACW	50
Holcus lanatus		FAC	20
Festuca arundinacea		FAC-	20
Hypericum perforatum		UPL	10
Agrostis stolonifera		FAC	10
Juncus effusus		FACW	5
Rumex crispus		FAC+	5
Woody Vine Stratum - % total cover:			**20**
Rubus ursinus		FACU	100

Shrub/Sapling Stratum - % total cover:	Ind.	%Cover: 40
Rosa nutkana	FAC	60
Rosa pisocarpa	FAC	20
Fraxinus latifolia	FACW	20
Tree Stratum - % total cover:		**0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 5 of 7 = 71 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Bornstedt silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Typic Haploxerult

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-9	10 YR 3/2	mottles common, small, concretions	Silt loam
	9-16	10 YR 4/3	mottles common, large	Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☑ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >16" Depth to saturation: >16"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres
☑ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:
☐ Local soil survey data
☐ FAC-Neutral test

Remarks: Matter under aged veg. On bare soil surface.

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CA-5 Plot: 60

T 3S R 2E S 9 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Far NE end of forested area; S of CCC Campus.

Project #: 7971165 Determined by: JG/PO Date: 7/16/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover: 100**
Camassia quamash	FACW	40
Prunella vulgaris	FACU	10
Carex deweyana	FACU	10
Agrostis stolonifera	FAC	10
Carex densa	OBL	10
Rumex conglomeratus	FACW	10
Geum macrophyllum	FACW	5
Rumex crispus	FAC+	5

Shrub/Sapling Stratum - % total cover: **0** Ind. %Cover:

Woody Vine Stratum - % total cover: **0**

Tree Stratum - % total cover: **0**		
Fraxinus latifolia	FACW	60
Quercus garryana	UPL	40

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 6 = 67 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Bornstedt silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Typic Haploxerult

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-6	10 YR 3/1 3/2	mottles few, fine, faint, concretions	Fine sandy silt loam
	6-16	10 YR 4/4	mottles common, large	Fine sandy silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☑ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >16" Depth to saturation: >16"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres
☑ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:
☐ Local soil survey data
☐ FAC-Neutral test

Remarks: Matted undecayed leaves, some evidence of algal mats on surface

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CA-5 Plot: 61

T 3S R 2E S 9 City: Oregon City County: Clackamas State: OR

Plot Location; Topography NW end of forested area; S pf CCC Campus.

Project #: 7971165 Determined by: JG/PO Date: 7/16/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**70**
Tellima grandiflora	UPL	20
Geum macrophyllum	FACW	5
Camassia quamash	FACW	5
Senecio jacobaea	FACU	5
Festuca arundinacea	FAC-	5
Juncus patens	FACW	5
Galium aparine	FACU	5

Shrub/Sapling Stratum - % total cover:		**20**
Symphoricarpos albus	FACU	60
Rubus parviflorus	FAC-	40
Crataegus monogyna	FACU	40

Woody Vine Stratum - % total cover:		**20**
Rubus ursinus	FACU	30
Rubus laciniatus	FACU	30

Tree Stratum - % total cover:		**60**
Fraxinus latifolia	FACW	100

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 1 of 7 = 14 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Bornstedt silt loam

Drainage Class: Moderately well drained

Taxonomy: Fine-silty, mixed, mesic Typic Haploxerult

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-8	10 YR 2/2	no significant mottles	Fine sandy silt loam
	8-16	10 YR 4/3	mottles common, large, concretion	Fine sandy silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >16" Depth to saturation: >16"

Primary Indicators:

☐ Inundated

☐ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☐ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Hydrology Criterion Met? No

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CA-5 Plot: 62

T 3S R 2E S 9 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Clearing just outside of middle of E edge of forested area; S pf CCC Campus.

Project #: 7971165 Determined by: JG/PO Date: 7/16/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:	**Ind.**	**%Cover: 90**
Carex obnupta	OBL	70
Carex deweyana	FACU	20
Agrostis stolonifera	FAC	5
Galium aparine	FACU	5
Polystichum munitum	FACU	5
Tellima grandiflora	UPL	5
Geum macrophyllum	FACW	5
Rumex conglomeratus	FACW	5

Shrub/Sapling Stratum - % total cover: **Ind. %Cover:**

Woody Vine Stratum - % total cover:

Tree Stratum - % total cover:

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 2 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Bornstedt silt loam

Drainage Class: Moderately well drained

Taxonomy: Fine-silty, mixed, mesic Typic Haploxerult

Horizon	**Depth**	**Matrix Color**	**Redox Abundance, Size, Color**	**Texture, Structure, Other**
	0-16	10 YR 3/2	mottles common, large, bright	Fine sandy silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >16 Depth to saturation: >16

Primary Indicators:

☐ Inundated

☐ Saturated in upper 12"

☑ Water marks

☐ Drift lines

☑ Sediment deposits

☑ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☑ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Remarks: evidence of ponding

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CA-5 Plot: 63

T 3S R 2E S 9 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Heavily forested area just inside forest edge about midway on E side; S of CCC Campus.

Project #: 7971165 Determined by: JG/PO Date: 7/16/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		Ind. %Cover: 5
Polystichum munitum	FACU	5
Carex deweyana	FACU	5

Shrub/Sapling Stratum - % total cover:		Ind. %Cover: 100
Symphoricarpos albus	FACU	70
Rhamnus purshiana	FAC-	15
Crataegus monogyna	FACU	15
Rhus diversiloba	UPL	5
Corylus cornuta	FACU	5
Holodiscus discolor	UPL	5
Rosa pisocarpa	FAC	4

Woody Vine Stratum - % total cover:		80
Rubus ursinus	FACU	60
Rubus laciniatus	FACU	40

Tree Stratum - % total cover:		100
Quercus garryana	UPL	40
Fraxinus latifolia	FACW	40
Pseudotsuga menziesii	FACU	20

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 1 of 6 = 17 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Bornstedt silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Typic haploxerult

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-5	10 YR 3/1		Fine sandy silt loam
	5-16	10 YR 4/4	mottles common, medium	Fine sandy silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >16" Depth to saturation: >16"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? No

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/16/98	Investigator(s):	JG/PO
Project Name:	City of Oregon City		
WetlandCode:	CA-5	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:		Q1:	B	Q1:	B	Q1:	B
Q2:	A	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	A	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	A	Q4:	C	Q4:	A
Q5:	B	Q5:		Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	B	Q6:	A
Q7:	A							Q7:	A		
Q8:	A										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	A	Q1:	B
Q2:	C	Q2:	A	Q2:	C	Q2:	C
Q3:		Q3:	B	Q3:	C	Q3:	A
Q4:	B	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-5	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Precipitation or sheet flow is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. More than 5 acres of wetland area. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is more than 5 acres. Waterflow out of wetland is unrestricted. Woody vegetation is dominant cover type. Agricultural land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-5	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		habitat, water quality and hydrologic control. Wetland's primary source of water is precipitation or sheet flow. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/14/98

Wetland Mapping Code: CA-6

Investigator(s): JG/PO

Size (acres): 1.2

Location

Legal: T3S R2E S9, 16

Other: Glen Oak Rd., E of Hwy. 213

Basin: Caufield Creek

Soils

Mapped Series: 24B

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PFO, PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Alnus rubra	*Physocarpus capitatus*	*Rubus discolor*	*Pteridium aquilinum*
Fraxinus latifolia			*Carex stipata*
Pseudotsuga menziesii			*Agrostis stolonifera*
Thuja plicata			*Juncus effusus*
Salix sp.			*Scirpus microcarpus*
Salix lasiandra			*Equisetum arvense*
			Myosotis laxa

Comments:

This wetland consists of a five segments hydrologically connected by drainage ditches. The forested portion of this site (CA6A) appears to be an excavated/ditched area on private land feeding to a road-side ditch system (CA6B,C) north of Glen Oak Road. Stream-side vegetation is limited to a very narrow corridor in some places, grazed to/through stream-side in others. The emergent segments (CA6D, E) are excavated ditches south of Glen Oak Road, with significant wetland vegetation approximately 3 feet wide, and bordered by agricultural fields. This wetland complex is connected by surface water to CA4 to the northwest and CA7 to the southeast.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/14/98	Investigator(s):	JG/PO
Project Name:	City of Oregon City		
WetlandCode:	CA-6a,b	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:	B	Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	A	Q2:	B	Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:	C	Q3:		Q3:	C	Q3:	C	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:	A	Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	A	Q6:	B	Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	C										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	B	Q1:	B
Q2:	A	Q2:	B	Q2:	C	Q2:	B
Q3:	A	Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	B	Q4:	B	Q4:	B
Q5a:		Q5:	B	Q5:	B	Q5:	A
Q5b:	C	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has little enhancement potential.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/14/98	Investigator(s):	JG/PO
Project Name:	City of Oregon City		
WetlandCode:	CA-6c,d,e	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	C	Q1:	C	Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	B	Q2:	C	Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:	C	Q3:		Q3:	A	Q3:	C	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	B	Q4:	C	Q4:	B
Q5:	A	Q5:	A	Q5:		Q5:	B	Q5:	B	Q5:	A
Q6:	A	Q6:	B	Q6:		Q6:	C	Q6:	B	Q6:	C
Q7:	A							Q7:	A		
Q8:	B										
Q9a:											
Q9b:	B										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	C	Q1:	C
Q2:	A	Q2:	B	Q2:	C	Q2:	A
Q3:	A	Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	A	Q4:	B	Q4:	A
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	B	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-6a,b	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	Between 50 and 75% of stream shaded by riparian vegetation. Portions of stream channel modified. Stream contains less than 10% of instream structures. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 ft of wetland edge. Non-Salmonid, non-sensitive fish species present sometime during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Low (<60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Minor restrictions slow down waterflow out of the wetland. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-6a,b	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has little enhancement potential.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is less than 0.5 acre. Less than 10% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, but observation of other features can be made. There is an unmaintained access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is an unmaintained public access point within 250 feet of the wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-6c,d,e	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with 5 or fewer plant species. Emergent veg. & ponding or open water only. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Agricultural land use within 500 feet of wetland edge.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	Less than 50% of stream shaded by riparian vegetation. Physical character of stream channel extensively modified/piped. Stream contains less than 10% of instream structures. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 ft of wetland edge. Non-Salmonid, non-sensitive fish species present sometime during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Agricultural land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Waterflow out of wetland is unrestricted. Emergent veg. and ponding , or open water only is dominant cover type. Agricultural land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Agricultural land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-6c,d,e	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Emergent veg. and ponding,or open water only are the dominant cover types.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is less than 0.5 acre. Between 10 and 40 % of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/14/98 **Wetland Mapping Code:** CA-7

Investigator(s): JG/PO **Size (acres):** 0.3

Location

Legal: T3S R2E S16

Other: Glen Oak Rd., E of Hwy. 213

Basin: Caufield Creek

Soils

Mapped Series: 24B, 45C

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PSS, PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia		*Rubus discolor*	
Crataegus monogyna	*Rosa nutkana*	*Marah oreganus*	
Alnus rubra			
Thuja plicata			

Comments:

DSL DET #97-0083. This is a small wetland bordered by open field. The scrub/shrub portion of the wetland is bordered by an emergent wetland area in the northeastern corner of the field. The area to the immediate east and south of the site is currently being developed. The source of water is possibly from a storm drain system or other unobserved source. A small stream exits to the north connecting to wetland CA6E.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/14/98	Investigator(s):	JG/PO
Project Name:	City of Oregon City		
WetlandCode:	CA-7a,b	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:		Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	A	Q2:		Q2:		Q2:	B	Q2:	B	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	C	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	B		
Q8:	C										
Q9a:											
Q9b:	C										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	C	Q1:	C
Q2:		Q2:	A	Q2:	C	Q2:	C
Q3:		Q3:	B	Q3:	C	Q3:	B
Q4:	C	Q4:	B	Q4:	B	Q4:	B
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-7a,b	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Unable to determine evidence of flooding or ponding during the growing season (or unapplicable). Moderate (approx. 60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. Unable to determine evidence of flooding or ponding during the growing season (or not applicable). Area is less than 0.5 acre. Waterflow out of wetland is unrestricted. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Agricultural land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CA-7a,b	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's area is less than 0.5 acre. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, but observation of other features can be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors, which can be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

CITY OF OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 6/12/97 **Wetland Mapping Code:** CL-1

Investigator(s): CM/JF **Size (acres):** 0.3

Location

Legal: T2S R2E S3,29

Other: East of Clackamette Pk.

Basin: Clackamas River

Soils

Mapped Series: 67

Hydrology

Hydrologic Source: Sheet flow

Wetland Classification(s): PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
	Populus balsamifera		*Pteridium aquilinum*
	Fraxinus latifolia		*Anthoxanthum odoratum*
			Holcus lanatus
			Chenopodium leptophyllu
			Festuca rubra
			Equisetum arvense
			Alopecurus geniculatus
			Rorippa curvisiliqua

Comments:

These are emergent wetlands confined to shallow depressions south of the Clackamas River and east of Hwy 99E and Clackamette Park.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CL-1 Plot: 2

T 2S R 2E S 29/3 City: Oregon City County: Clackamas State: OR

Plot Location; Topography East of Clackamette Park between the Clackamas River and Clackamette Cove.

Project #: 7971165 Determined by: JF/CM Date: 6/12/97

DETERMINATION: IS THIS PLOT IN A WETLAND? Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover: 90**
Alopecurus geniculatus	OBL	50
Rorippa curvisiliqua	OBL	20
Phalaris arundinacea	FACW	15
Ludwigia palustris	OBL	10
Bidens frondosa	FACW	5

Shrub/Sapling Stratum - % total cover:		**Ind. %Cover: 10**
Populus balsamifera	FAC	100

Woody Vine Stratum - % total cover: **0**

Tree Stratum - % total cover: **0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 3 of 3 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Newberg fine sandy loam
Drainage Class: Somewhat excessively drained
Taxonomy: Coarse-loamy, mixed, mesic Fluventic Haploxeroll

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-6"	10 YR 4/3	mottles many, 7.5 YR 5/6	Silt
	6-18"			Cobble

☐ Histosol ☑ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☑ Other
Explain: Moist throughout.
☐ Local soil survey data
☐ FAC-Neutral test

Remarks: Evidence of ponding during wet season.

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CL-1 Plot: 3

T 2S R 2E S 29/30 City: Oregon City County: Clackamas State: OR

Plot Location; Topography East of Clackamette park between the Clackamas River and Clackamette Cove.

Project #: 7971165 Determined by: JF/CM Date: 6/12/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Comments: Vegetation is indicative of wetland, but soil and hydrology criteria not met.

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		Ind. %Cover: 60	Shrub/Sapling Stratum - % total cover:		Ind. %Cover: 40
Anthoxanthum odoratum	FACU	20	*Populus balsamifera*	FAC	50
Holcus lanatus	FAC	20	*Fraxinus latifolia*	FACW	20
Chenopodium leptophyllum	FACU	20	*Crataegus monogyna*	FACU	15
Festuca rubra	FAC+	20	*Salix lasiandra*	FACW	15
Asclepias speciosa	FAC+	10			
Phalaris arundinacea	FACW	10			
Woody Vine Stratum - % total cover:		0	**Tree Stratum** - % total cover:		0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 6 = 67 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Newberg fine sandy loam
Drainage Class: Somewhat excessively drained
Taxonomy: Coarse-loamy, mixed, mesic Fluventic Haploxeroll

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"	2.5 Y 4/2		Sandy silt

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? No

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	DC/CM
Project Name:	City of Oregon City		
WetlandCode:	CL-1	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:		Q1:		Q1:	B	Q1:	A	Q1:	B
Q2:	C	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	C	Q4:	A	Q4:	C
Q5:	B	Q5:		Q5:		Q5:	C	Q5:	C	Q5:	C
Q6:	B	Q6:		Q6:		Q6:	C	Q6:	C	Q6:	B
Q7:	A							Q7:	C		
Q8:	A										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	B	Q1:	C	Q1:	C
Q2:	C	Q2:	A	Q2:	C	Q2:	A
Q3:		Q3:	B	Q3:	B	Q3:	A
Q4:	C	Q4:	A	Q4:	B	Q4:	A
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	A	Q6:	A	Q6:	B	Q6:	B
Q6:	A						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is lost or not present.
Sensitivity to Impact:	The wetland is not sensitive to future impacts.
Enhancement Potential:	The wetland has little enhancement potential.
Education:	The wetland has potential for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CL-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland not connected to other wetlands, but within 3 mile radius of other wetlands. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Precipitation or sheet flow is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Less than 0.5 acre and wetland is not connected to other wetland within a 3 mile radius. Exclusive Forest use or Open Space within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is lost or not present.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Waterflow out of wetland is restricted or no outlet. Emergent veg. or wet meadow is dominant cover type. Exclusive Forest Use or Open Space within 500 ft of wetland on downstream or down-slope edge of wetland. Forested or natural area land use upstream.
Sensitivity to Impact	The wetland is not sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Exclusive Forest use or Open Space within 500 feet of wetland's edge. Dominant Exclusive Forest use or Open Space. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has little enhancement potential.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CL-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		habitat, water quality and hydrologic control. Wetland's primary source of water is precipitation or sheet flow. Wetland's area is less than 0.5 acre. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is not sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation, but allowed only with permission. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. Existing undeveloped trails and viewing ares to guide user. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/15/98 **Wetland Mapping Code:** CL-2

Investigator(s): DC/CM **Size (acres):** 1.3

Location

Legal: T2S R2E S29, 30

Other: WNW of Hwy. 213/Washington St. intersection

Basin: Clackamas River

Soils

Mapped Series: 82

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): POW

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia	*Salix sp.*		*Juncus effusus*
Alnus rubra			*Phalaris arundinacea*
Salix sp.			*Lemna minor*

Comments:

The wetland is a constructed pond with open water and two islands. Steep, landscaped banks with a trail surround the pond.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	DC/CM
Project Name:	City of Oregon City		
WetlandCode:	CL-2	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	C	Q1:		Q1:	A	Q1:	C	Q1:	A	Q1:	B
Q2:	B	Q2:		Q2:	B	Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:	B	Q3:	C	Q3:	B	Q3:	C
Q4:	B	Q4:		Q4:	A	Q4:	B	Q4:	B	Q4:	A
Q5:	B	Q5:		Q5:	C	Q5:	A	Q5:	B	Q5:	A
Q6:	A	Q6:		Q6:	B	Q6:	C	Q6:	A	Q6:	C
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	A	Q1:	C
Q2:	B	Q2:	A	Q2:	C	Q2:	A
Q3:		Q3:	B	Q3:	A	Q3:	A
Q4:	B	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	B
Q5b:	A	Q6:	A	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	The wetland's fish habitat function is impacted or degraded.
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland provides recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CL-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with 5 or fewer plant species. Emergent veg. & ponding or open water only. Low degree of Cowardin class interspersion. Between 0.5 and 1 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	The wetland's fish habitat function is impacted or degraded.	More than 75% of stream shaded by riparian vegetation. Portions of stream channel modified. Stream contains between 10 and 25% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. Non-Salmonid, non-sensitive fish species present sometime during the year.
Water Quality	The wetland's water quality function is impacted or degraded.	Groundwater (including seeps and springs) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Low (<60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Emergent veg. and ponding , or open water only is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CL-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. and ponding,or open water only are the dominant cover types.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is groundwater, including springs and seeps. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is available for limited mobility.
Recreation	The wetland provides recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. Existing developed and maintained trails and viewing areas to guide user. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is landscaped or manipulated by people. At certain times, unpleasant odors are present at the primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/15/98

Wetland Mapping Code: CL-3

Investigator(s): CM/DC

Size (acres): 6.3

Location

Legal: T2S R2E S29

Other:

Basin: Clackamas River

Soils

Mapped Series: 16, 84

Hydrology

Hydrologic Source: Groundwater

Wetland Classification(s): PEM, PFO

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Populus balsamifera	*Crataegus monogyna*	*Rubus discolor*	*Phalaris arundinacea*
Salix lasiandra	*Salix lasiandra*		*Festuca rubra*
Fraxinus latifolia			*Holcus lanatus*
Alnus rubra			*Anthoxanthum odoratum*
			Chrysanthemum leucanthemum

Comments:

The wetland is a former log yard with asphalt and bark chip fill up to several feet deep in some areas. Wetlands are the result of shallow groundwater and surface ponding in low-lying parts. Outer portions of the site are ditched.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CL-3 Plot: 4

T 2S R 2E S 29 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Narrow drainage on north side of RR directly west of Trails End Hwy.

Project #: 7971165 Determined by: JF/CM Date: 6/12/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

Explanation: Disturbance of the site has ocurred in the past.

VEGETATION Dominant Plant Species

	Ind.	%Cover:		Ind.	%Cover:
Herb Stratum - % total cover:		30	**Shrub/Sapling Stratum** - % total cover:		60
Phalaris arundinacea	FACW	100	*Crataegus douglasii*	FAC	80
			Fraxinus latifolia	FACW	20
Woody Vine Stratum - % total cover:		0	**Tree Stratum** - % total cover:		10
			Crataegus douglasii	FAC	100

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 4 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Wapato silty clay loam
Drainage Class: Poorly drained
Taxonomy: Fine-silty, mixed, mesic Fluvaquentic Haplaquolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"	10 YR 3/2		Silt loam

☐ Histosol ☑ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☑ On hydric soils list

Remarks: Site was filled at some time in the past.

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☑ Drift lines
☑ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:
☐ Local soil survey data
☐ FAC-Neutral test

Remarks: Matted vegetation debris.

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CL-3 Plot: 5

T S2 R 2E S 29 City: Oregon City County: Clackamas State: OR

Plot Location; Topography East of the Oregon Trail interpretive center - North of RR tracks.

Project #: 7971165 Determined by: JF/CM Date: 6/12/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:		Ind.	%Cover:
Herb Stratum - % total cover:		**0**	**Shrub/Sapling Stratum** - % total cover:		**100**
			Cytisus scoparius	UPL	60
Woody Vine Stratum - % total cover:		**100**	**Tree Stratum** - % total cover:		**100**
Rubus discolor	FACU	20	*Alnus rubra*	FAC	20

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 1 of 3 = 33 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Wapato silty clay loam

Drainage Class: Poorly drained

Taxonomy: Fine-silty, mixed, mesic Fluvaquentic Haplaquolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"+	10 YR 3/3		Wood chip loam

☐ Histosol ☑ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☑ On hydric soils list

Remarks: No recent disturbance of site but historic industrial development and filling of this area has changed its character.

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:

☐ Inundated

☐ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☑ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☑ Other

Explain: Within floodplain of small drainage.

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	CM/DC
Project Name:	City of Oregon City		
WetlandCode:	CL-3	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	C	Q1:		Q1:		Q1:	B	Q1:	A	Q1:	B
Q2:	A	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	A	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	B										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	A	Q1:	C
Q2:	C	Q2:	B	Q2:	C	Q2:	B
Q3:	A	Q3:	B	Q3:	C	Q3:	C
Q4:	B	Q4:	B	Q4:	B	Q4:	C
Q5a:		Q5:	A	Q5:	B	Q5:	B
Q5b:	B	Q6:	B	Q6:	B	Q6:	C
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is not pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CL-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with 5 or fewer plant species. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Precipitation or sheet flow is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Waterflow out of wetland is restricted or no outlet. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CL-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Wetland's primary source of water is precipitation or sheet flow. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is between 0.5 and 5 acres. Between 10 and 40 % of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, but observation of other features can be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is not pleasing.	One Cowardin class is visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is developed with no landscaping. At certain times, unpleasant odors are present at the primary viewing location. Continuous traffic and other intrusive noise and NO natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/15/98

Wetland Mapping Code: CL-4

Investigator(s): CM/DC

Size (acres): 2

Location

Legal: T2S R2E S29

Other: SE of I-205/Hwy. 213 interchange

Basin: Clackamas River

Soils

Mapped Series: 16

Hydrology

Hydrologic Source: Precipitation

Wetland Classification(s): PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Populus balsamifera	*Cytisus scoparius*		*Festuca arundinacea*
			Juncus effusus
			Carex unilateralis
			Phalaris arundinacea
			Holcus lanatus

Comments:

The wetland is a disturbed, palustrine emergent field isolated by roadway and railroad tracks. There is evidence of ponding during wet weather episodes.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CL-4 Plot: 6

T 2S R 2E S 29 City: Oregon City County: Clackamas State: OR

Plot Location; Topography South of RR between Trails End Hwy and Clackamas River Dr.

Project #: 7971165 Determined by: JF/CM Date: 6/12/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Comments: This site has been filled to some extent and the native hydric soil is probably buried.

Do Normal Circumstances exist on the site? Yes

Are Soils ☑ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover: 85**	**Shrub/Sapling Stratum** - % total cover:		**Ind. %Cover: 15**
Carex unilateralis	FACW	55	*Populus balsamifera*	FAC	100
Holcus lanatus	FAC	15			
Festuca arundinacea	FAC-	15			
Phalaris arundinacea	FACW	15			
Woody Vine Stratum - % total cover:		**0**	**Tree Stratum** - % total cover:		**0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 2 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Wapato silty clay loam
Drainage Class: Poorly drained
Taxonomy: Fine-silty, mixed, mesic Fluvaquentic Haplaquolls.

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-3"	5 YR 4/4		Sandy silt
	3-18"+	2.5 Y 5/3	Matrix mixed with 10 YR 5/1	Sandy silt

☐ Histosol ☑ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☑ On hydric soils list

Remarks: No recent disturbance of site but historic industrial development and filling of this area has changed its character.

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☑ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☑ Other
Explain: Within floodplain of small drainage.
☐ Local soil survey data
☐ FAC-Neutral test

Remarks: Evidence of former surface ponding present. Site very hummocky.

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	CM/DC
Project Name:	City of Oregon City		
WetlandCode:	CL-4	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	C	Q1:		Q1:		Q1:	B	Q1:	A	Q1:	A
Q2:	C	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	B	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	A	Q4:	A
Q5:	B	Q5:		Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	B	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	B	Q1:	C
Q2:	C	Q2:	B	Q2:	C	Q2:	A
Q3:		Q3:	B	Q3:	C	Q3:	C
Q4:	B	Q4:	A	Q4:	B	Q4:	C
Q5a:		Q5:	B	Q5:	B	Q5:	B
Q5b:	A	Q6:	A	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CL-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with 5 or fewer plant species. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland not connected to other wetlands, but within 3 mile radius of other wetlands. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Precipitation or sheet flow is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Moderate (approx. 60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Waterflow out of wetland is restricted or no outlet. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential		

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CL-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is precipitation or sheet flow. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is an unmaintained access point within 250 feet of the wetland's edge. Access is available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is an unmaintained public access point within 250 feet of the wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is developed with no landscaping. At certain times, unpleasant odors are present at the primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 07/15/98

Wetland Mapping Code: CO-1

Investigator(s): KC/ES

Size (acres): 1.1

Location

Legal: T3S R2E S6

Other: Chapin Park, continuing N/NW of Warner Parrot Rd.

Basin: Coffee Creek

Soils

Mapped Series: 30C, 92F

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PEM

Dominant Vegetation

Trees | **Shrubs** | **Vines** | **Herbs**

Comments:

OFF-SITE DETERMINATION. At Coffee Creek Falls, the vegetation is predominantly a bigleaf maple (Acer macrophyllum) overstory with a shrub and woody vine understory. From the top of the falls south, the creek flow becomes intermittent, following a course through residential neighborhoods. Landscaping to the stream edge appears to be the common condition. Bulrush (Scirpus sp.), rushes (Juncus sp.), and horsetail (Equisetum sp.) were present in and along the stream channel, as viewed from accessible road crossings.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	KC/ES
Project Name:	City of Oregon City		
WetlandCode:	CO-1a,b,c,d,e	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:	C	Q1:		Q1:	A	Q1:	A	Q1:	A
Q2:	C	Q2:	C	Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:	C	Q3:		Q3:	B	Q3:	B	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:	C	Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	A	Q6:	A	Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	B										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	B	Q1:	A	Q1:	A
Q2:	A	Q2:	A	Q2:	C	Q2:	C
Q3:	A	Q3:	B	Q3:	C	Q3:	C
Q4:	B	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	B	Q6:	A	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CO-1a,b,c,d,e	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	Less than 50% of stream shaded by riparian vegetation. Physical character of stream channel extensively modified/piped. Stream contains less than 10% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. Salmon, trout, or sensitive species present sometime during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Moderate (approx. 60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CO-1a,b,c,d,e	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is between 0.5 and 5 acres. Between 10 and 40 % of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation, but allowed only with permission. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	More than two Cowardin classes are visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/14/98

Wetland Mapping Code: CO-3

Investigator(s): DC/KC

Size (acres): 0.2

Location

Legal: T2S R2E S31

Other: Fifth Ave. and South End Road

Basin: Coffee Creek

Soils

Mapped Series: 92F

Hydrology

Hydrologic Source: Groundwater

Wetland Classification(s): PSS, POW

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
	Salix scouleriana	*Rubus discolor*	*Sagittaria latifolia*
			Phalaris arundinacea
			Athyrium filix-femina

Comments:

This wetland has a natural pond that is reportedly located on an ancient volcanic crater. The pond is vegetated with aquatic plants over 50% of the area, and is surrounded by forest on the south, natural landscaping on the west, a road on the north, and a partially cleared garden area on the east. The wetland drains into a small ditch broken by a culvert under Fifth Avenue and into Coffee Creek to the north.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/14/98	Investigator(s):	DC/KC
Project Name:	City of Oregon City		
WetlandCode:	CO-3	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:	A	Q1:	C	Q1:	A	Q1:	B
Q2:	B	Q2:		Q2:	A	Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:	A	Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:	A	Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:		Q5:	C	Q5:	A	Q5:	B	Q5:	A
Q6:	A	Q6:	A	Q6:	C	Q6:	C	Q6:	A	Q6:	C
Q7:	A							Q7:	C		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	A	Q1:	A
Q2:	B	Q2:	A	Q2:	C	Q2:	A
Q3:		Q3:	B	Q3:	B	Q3:	B
Q4:	C	Q4:	A	Q4:	B	Q4:	A
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	A	Q6:	A	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	The wetland's fish habitat function is impacted or degraded.
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has educational uses.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CO-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. & ponding or open water only. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	Salmon, trout, or sensitive species present sometime during the year.
Fish Habitat - Lakes/Ponds	The wetland's fish habitat function is impacted or degraded.	More than 75% of stream shaded by riparian vegetation. Stream channel natural/returning to natural physical character. Stream contains more than 25% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. No fish species present during the year.
Water Quality	The wetland's water quality function is impacted or degraded.	Groundwater (including seeps and springs) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Moderate (approx. 60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Minor restrictions slow down waterflow out of the wetland. Emergent veg. and ponding , or open water only is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Forested or natural area land use upstream.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CO-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. and ponding,or open water only are the dominant cover types.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is groundwater, including springs and seeps. Wetland's area is less than 0.5 acre. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has educational uses.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is a maintained public access point within 250 feet of the wetland's edge. Access is available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. Existing undeveloped trails and viewing ares to guide user. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	More than two Cowardin classes are visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors, which can be removed easily. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

CITY OF OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 6/14/97

Wetland Mapping Code: CO-4

Investigator(s): DC/JF

Size (acres): 0.64

Data Sheet Numbers: 19, 27

Location

Legal: T2S R2E S31, T3S R2E S6

Other: Between Hwy. 99E & South End Rd.

Basin: Coffee Creek

Soils

Mapped Series: 30C, 78D, 92F

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PSS, RSB

Dominant Vegetation

Trees	Shrubs	Vines	Herbs

Comments:

This wetland is located on a flat bench adjacent to Coffee Creek and may get overflow from the creek. Groundwater also feeds the wetland. This scrub/shrub wetland is completely shaded by trees. Water flows from the wetland to Coffee Creek at the NW corner of the wetland. The wetland is surrounded by steep slopes; however, NE of the wetland there appears to be a partially developed building site. Coffee Creek is steep and forested in this reach. The downstream portions flow between or under residences. The upstream portion contains Coffee Creek waterfall.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CO-4 Plot: 27

T 2S R 2E S 31 City: Oregon City County: Clackamas State: OR

Plot Location; Topography S 0f Hwy 99E; W of Old Canemah Park

Project #: 7971165 Determined by: DC/JF Date: 6/4/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	% Cover:
Herb Stratum - % total cover:		**20**
Athyrium filix-femina	FAC	30
Tellima grandiflora	UPL	25
Hydrophyllum fendleri	FAC	20
Shrub/Sapling Stratum - % total cover:		**80**
Rubus spectabilis	FAC+	100
Woody Vine Stratum - % total cover:		**10**
Rubus discolor	FACU	100
Hedera helix	UPL	15
Tree Stratum - % total cover:		**0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 3 of 5 = 60 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Saum silt loam

Drainage Class: Well drained

Taxonomy: Fine, mixed, mesic Typic Xerumbrepts

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-10"	10 YR 3/2	mottles large, 7.5 YR 3/3	Fine silt
	10-18"+	10 YR 3/1	mottles some, gleyed, 2.5 Y 3/3	Fine silt

☐ Histosol ☑ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☑ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 7" Depth to saturation: Surface

Primary Indicators:

☐ Inundated

☑ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☑ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: CO-4 Plot: 19

T 2S R 2E S 31 City: Oregon City County: Clackamas State: OR

Plot Location; Topography S of Hwy 99E; W of Old Canemah Park

Project #: 7971165 Determined by: DC/JF Date: 6/14/97

DETERMINATION: IS THIS PLOT IN A WETLAND? No

Do Normal Circumstances exist on the site? No

Explanation: Area has been filled with very rocky soil.

Are Soils ☑ Vegetation ☑ Hydrology ☐ significantly disturbed? Yes

Explanation: Not a probable former wetland.

VEGETATION Dominant Plant Species

	Ind.	% Cover:		Ind.	% Cover:
Herb Stratum - % total cover:		30	**Shrub/Sapling Stratum** - % total cover:		25
Hedera helix	UPL	40	*Corylus cornuta*	FACU	70
Clematis ligusticifolia	FAC-	40			
Polystichum munitum	FACU	20			
Woody Vine Stratum - % total cover:		10	**Tree Stratum** - % total cover:		45
Rubus ursinus	FACU	30	*Acer macrophyllum*	FACU	100

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 0 of 6 = 0 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Saum silt loam
Drainage Class: Well drained
Taxonomy: Fine, mixed, mesic Typic Xerumbrepts

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Remarks: Soil was too rocky and compacted to penetrate.

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? No

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/14/98	Investigator(s):	DC/KC
Project Name:	City of Oregon City		
WetlandCode:	CO-4	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:		Q1:		Q1:	A	Q1:	A	Q1:	A
Q2:	A	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	B	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	A	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	B	Q1:	A	Q1:	C
Q2:	A	Q2:	A	Q2:	C	Q2:	C
Q3:	C	Q3:	B	Q3:	C	Q3:	A
Q4:	B	Q4:	A	Q4:	B	Q4:	A
Q5a:		Q5:	A	Q5:	B	Q5:	B
Q5b:	A	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CO-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Moderate (approx. 60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Waterflow out of wetland is restricted or no outlet. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate	Wetland has lost one or more functions or

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CO-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
	potential for enhancement.	one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is restricted and cannot be restored. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation, but allowed only with permission. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is open or naturally landscaped. At certain times, unpleasant odors are present at the primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 07/15/98

Wetland Mapping Code: CP-1

Investigator(s): KC/ES

Size (acres): 0.1

Location

Legal: T3S R2E S7

Other: N&NE of Central Point Rd./McCord Rd. intersection

Basin: Central Point

Soils

Mapped Series: 30C

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs

Comments:

OFF-SITE DETERMINATION. A drainage ditch separates the properties within residential areas NW and SE of Central Point Rd. CP-1a has an overstory of Oregon ash (Fraxinus latifolia), with unknown herbaceous vegetation in the ditch. The CP-1b ditch contains only rushes (Juncus spp.) and other herbaceous vegetation. This area is heavily landscaped. Soil and rock were added to the channel banks along the length of the lot on the corner of McCord Rd. & Sunset Springs Drive.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	KC/ES
Project Name:	City of Oregon City		
WetlandCode:	CP-1a,b	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	C	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	C	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	C	Q4:	B	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	C										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	A	Q1:	B
Q2:	A	Q2:	A	Q2:	C	Q2:	B
Q3:	C	Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	C	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has little enhancement potential.
Education:	The wetland has potential for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CP-1a,b	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Low (<60%) degree of wetland vegetation cover. Less than 0.5 acre and wetland is not connected to other wetland within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Minor restrictions slow down waterflow out of the wetland. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has little enhancement potential.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CP-1a,b	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is restricted and cannot be restored. Wetland's area is less than 0.5 acre. Less than 10% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 07/16/98

Wetland Mapping Code: CP-2

Investigator(s): KC/ES

Size (acres): 0.3

Location

Legal: T3S R2E S7

Other: SE of intersection of McCord Rd. and Central Point Rd.

Basin: South End

Soils

Mapped Series: 24B

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs

Comments:

OFF-SITE DETERMINATION. This site is located on an agricultural property (hazelnut [Corylus cornuta] orchard) and is not visible from the road. The wetland determination was made using an aerial photograph and intermittent stream information from the City of Oregon City LWI/township, range, section map that shows an intermittent stream flowing diagonally across the property. Cottrell silty clay loam has inclusions of hydric soil.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/16/98	Investigator(s):	KC/ES
Project Name:	City of Oregon City		
WetlandCode:	CP-2	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:		Q1:		Q1:	C	Q1:	B	Q1:	A
Q2:	A	Q2:		Q2:		Q2:	B	Q2:	C	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	C	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	A	Q4:	B
Q5:	B	Q5:		Q5:		Q5:	B	Q5:	A	Q5:	A
Q6:	B	Q6:		Q6:		Q6:	C	Q6:	B	Q6:	A
Q7:	A							Q7:	A		
Q8:	B										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	C	Q1:	C
Q2:	B	Q2:	A	Q2:	C	Q2:	C
Q3:		Q3:	B	Q3:	C	Q3:	C
Q4:	B	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CP-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland not connected to other wetlands, but within 3 mile radius of other wetlands. Upstream not listed as water quality limited. Agricultural land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Groundwater (including seeps and springs) is wetland's primary source of water. Unable to determine evidence of flooding or ponding during the growing season (or unapplicable). Low (<60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Agricultural land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. No evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Waterflow out of wetland is restricted or no outlet. Woody vegetation is dominant cover type. Agricultural land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Agricultural land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CP-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is groundwater, including springs and seeps. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 07/16/98

Wetland Mapping Code: CP-3

Investigator(s): KC/ES

Size (acres): 0.9

Location

Legal: T3S R2E S7

Other: From Central Point Rd. on McCord Rd. est. 1,800 feet

Basin: Central Point

Soils

Mapped Series: 46C, 92F

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): RSB, PFO

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Acer macrophyllum		*Rubus discolor*	

Comments:

OFF-SITE DETERMINATION. The wetland is north of McCord Rd. The stream channel/ditch borders a rural residence. Boulders have been placed along the channel. The stream is diverted under McCord Rd. through a culvert and exits down a ravine south of McCord Rd. Dominant vegetation in the ravine is bigleaf maple (Acer macrophyllum) and Himalayan blackberry (Rubus discolor).

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/16/98	Investigator(s):	KC/ES
Project Name:	City of Oregon City		
WetlandCode:	CP-3	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:	A	Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	A	Q2:	C	Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:	C	Q3:		Q3:	B	Q3:	A	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	A	Q4:	B	Q4:	A
Q5:	A	Q5:	C	Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	A	Q6:	C	Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	C	Q1:	C
Q2:	A	Q2:	B	Q2:	C	Q2:	C
Q3:	C	Q3:	B	Q3:	C	Q3:	C
Q4:	A	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CP-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	More than 75% of stream shaded by riparian vegetation. Physical character of stream channel extensively modified/piped. Stream contains less than 10% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. No fish species present during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Moderate (approx. 60%) degree of wetland vegetation cover. More than 5 acres of wetland area. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is more than 5 acres. Minor restrictions slow down waterflow out of the wetland. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	CP-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is restricted and cannot be restored. Wetland's area is more than 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 6/12/97

Wetland Mapping Code: FO-1

Investigator(s): JF/CM

Size (acres): 1.2

Location

Legal: T2S R2E S21

Other: South of intersection of Forsythe and Gerkman Roads

Basin: Forsythe

Soils

Mapped Series: 41

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
			Holcus lanatus
			Juncus effusus
			Anthoxanthum odoratum

Comments:

This wetland area is currently being used as a pasture. It appears that drain tile was installed in the past. Vegetation consists of grasses and rushes that can withstand large ungulate hoof impacts. A grove of Oregon white oak (Quercus garryana) is located directly north of the wetland. Adjacent fields are ditched around their perimeters to improve water removal.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: FO-1 Plot: 1

T 2S R 2E S 21 City: Oregon City County: Clackamas State: OR

Plot Location; Topography South of the intersection of Forsythe and Gerkman Rds. Sloped ag field with oak grove.

Project #: 7971165 Determined by: JF/CM Date: 6/12/97

DETERMINATION: IS THIS PLOT IN A WETLAND? Yes

Comments: This field appears to have had drain tile installed.

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover:** 100	**Shrub/Sapling Stratum** - % total cover:	**Ind. %Cover:** 0
Holcus lanatus	FAC	50		
Juncus effusus	FACW	30		
Anthoxanthum odoratum	FACU	20		
Woody Vine Stratum - % total cover:		0	**Tree Stratum** - % total cover:	0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 3 = 67 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Dayton silt loam

Drainage Class: Poorly drained

Taxonomy: Fine, montmorillonitic, mesic Typic Albaqualf

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-8"	10 YR 4/1		Silt
	8-18"+	2.5 Y 5/2	mottles many, 7.5 YR 4/4	

☐ Histosol ☑ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking

☐ Histic epipedon ☑ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☑ On hydric soils list

Remarks: Very typical hydric soil.

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:

☐ Inundated

☐ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☑ Drainage patterns

Secondary Indicators (2 or more required):

☑ Oxidized rhizospheres

☐ Water-stained leaves

☐ Recorded data (aerials, groundwater data)
Explain:

☐ Other
Explain:

☑ Local soil survey data

☐ FAC-Neutral test

Remarks: Evidence of inundation during wet season.

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/16/98	Investigator(s):	CM/DG
Project Name:	City of Oregon City		
WetlandCode:	FO-1	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	C	Q1:		Q1:		Q1:	C	Q1:	B	Q1:	A
Q2:	C	Q2:		Q2:		Q2:	C	Q2:	C	Q2:	A
Q3:	C	Q3:		Q3:		Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	C	Q4:	A	Q4:	B
Q5:	C	Q5:		Q5:		Q5:	B	Q5:	C	Q5:	B
Q6:	B	Q6:		Q6:		Q6:	C	Q6:	B	Q6:	B
Q7:	A							Q7:	B		
Q8:	B										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	B	Q1:	C	Q1:	C
Q2:	B	Q2:	A	Q2:	C	Q2:	A
Q3:		Q3:	B	Q3:	C	Q3:	A
Q4:	C	Q4:	B	Q4:	B	Q4:	B
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is lost or not present.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	FO-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with 5 or fewer plant species. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, and no water within 1 mile. Wetland not connected to other wetlands, but within 3 mile radius of other wetlands. Upstream not listed as water quality limited. Agricultural land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is lost or not present.	Groundwater (including seeps and springs) is wetland's primary source of water. No evidence of flooding or ponding during the growing season. Moderate (approx. 60%) degree of wetland vegetation cover. Less than 0.5 acre and wetland is not connected to other wetland within a 3 mile radius. Agricultural land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. No evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Waterflow out of wetland is restricted or no outlet. Emergent veg. or wet meadow is dominant cover type. Agricultural land use within 500 ft of wetland on downstream or down-slope edge of wetland. Agricultural land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is being taken out of stream(s) through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Agricultural land use within 500 feet of wetland's edge. Dominant Agricultural land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	FO-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is groundwater, including springs and seeps. Wetland's area is less than 0.5 acre. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation, but allowed only with permission. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, but observation of other features can be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

CITY OF OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 6/27/97,7/3/97 **Wetland Mapping Code:** LI-2

Investigator(s): JF/DC, DC/CM **Size (acres):** 4.1

Location

Legal: T2S R2E S28

Other: NE of intersection of Hw. 213 and Redland Rd.

Basin: Livesay Creek

Soils

Mapped Series: 91A, 92F

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): RSB, PEM, PFO

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
	Rubus spectabilis	*Rubus ursinus*	*Lysichitum americanum*
	Sambucus racemosa	*Rubus discolor*	*Polystichum munitum*
	Corylus cornuta		*Equisetum arvense*
	Salix scouleriana		*Urtica dioica*

Comments:

The wetland is in a mixed open/forest canopy surrounding the stream channel of Livesay Creek. Steep slopes are present on either side of a narrow valley. Single-family residences and some undeveloped properties are located on bluffs above the channel. Stream banks are steep and mostly overgrown with grasses and shrubs. The stream channel averages 8 inches in width (bankfull) and has minor sinuosity.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: LI-2 Plot: 10

T 2S R 2E S 29 City: Oregon City County: Clackamas State: OR

Plot Location; Topography NE of intersection of Redland Rd. and Trails End Hwy.

Project #: 7971165 Determined by: DC/CM Date: 7/3/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		95
Phalaris arundinacea	FACW	60
Urtica dioica	FAC+	20
Woody Vine Stratum - % total cover:		10
Solanum dulcamara	FAC+	15

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		5
Salix scouleriana	FAC	100
Tree Stratum - % total cover:		0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 3 of 3 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Xerochrepts and Haploxerolls
Drainage Class: Well drained
Taxonomy: Xerochrepts and Haploxerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-6"	10 YR 3/3		Silt
	6-18+"	5 Y 3/1		Fine sandy silt

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☑ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Remarks: Hydric soil characteristics are weak due to filling and other disruptions. Buried woody depris encountered in sample pit.

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 18" Depth to saturation: Surface

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Remarks: Stream within five feet of plot.

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: LI-2 Plot: 11

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography North of Livesay Creek on a wet bench, E of Holcomb Rd/Hwy 213

Project #: 7971165 Determined by: DC/CM Date:

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover:** 90	**Shrub/Sapling Stratum** - % total cover:		**Ind. %Cover:** 10
Lysichitum americanum	OBL	35	*Salix scouleriana*	FAC	100
Equisetum arvense	FAC	35			
Urtica dioica	FAC+	30			
Woody Vine Stratum - % total cover:		0	**Tree Stratum** - % total cover:		0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 4 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Xerochrepts and Haploxerolls
Drainage Class: Well drained
Taxonomy: Xerochrepts and Haploxerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"+	10 YR 3/1		Silt loam

☐ Histosol ☑ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☑ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 17" Depth to saturation: 0-4"

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: LI-2 Plot: 12

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography NW of Holcomb Creek. Upslope from a large seep.

Project #: 7971165 Determined by: JF/DC Date: 6/27/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		**20**
Polystichum munitum	FACU	100
Woody Vine Stratum - % total cover:		**10**
Rubus ursinus	FACU	50
Rubus discolor	FACU	50

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		**100**
Rubus spectabilis	FAC+	40
Corylus cornuta	FACU	30
Sambucus racemosa	FACU	30
Tree Stratum - % total cover:		**0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 1 of 6 = 17 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Woodburn silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Lithic Aquultic Argixeroll

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"+	10 YR 4/3		Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? No

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: LI-2 Plot: 13

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Wide wetland slump zone along Holcomb Creek. Downstream of junction w/ Hidden Ck.

Project #: 7971165 Determined by: JF/DC Date: 6/27/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:		Ind.	%Cover:
Herb Stratum - % total cover:		80	**Shrub/Sapling Stratum** - % total cover:		20
Lysichitum americanum	OBL	70			
Stachys cooleyae	FACW	10			
Urtica dioica	FAC+	10			
Oenanthe sarmentosa	OBL	10			
Woody Vine Stratum - % total cover:		0	**Tree Stratum** - % total cover:		0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 1 of 1 = 100 % (50/20 Rule)

Remarks: Rubus spectabilis (40%) and Sambucus racemosa (30%) are rooted outside the wetland area.

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Woodburn silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Lithic Argixeroll

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-3"	10 YR 3/2		silty clay
	3-18"	5 YR 3/1	mottles common, large, 7.5 YR 3/4	silty clay

☐ Histosol ☑ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☑ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 12" Depth to saturation: Surface

Primary Indicators:
☑ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/21/98	Investigator(s):	KC/PO
Project Name:	City of Oregon City		
WetlandCode:	LI-2	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams	Fish Habitat Lakes/Ponds	Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:	Q1:	Q1:	A	Q1:	A	Q1:	B
Q2:	C	Q2:	Q2:	Q2:	A	Q2:	A	Q2:	B
Q3:	B	Q3:	Q3:	Q3:	A	Q3:	B	Q3:	C
Q4:	B	Q4:	Q4:	Q4:	B	Q4:	B	Q4:	C
Q5:	A	Q5:	Q5:	Q5:	C	Q5:	C	Q5:	A
Q6:	A	Q6:	Q6:	Q6:	C	Q6:	A	Q6:	C
Q7:	A					Q7:	A		
Q8:	A								
Q9a:									
Q9b:	A								

Enhancement Potential	Education		Recreation		Aesthetic Quality	
Q1:	Q1:	C	Q1:	C	Q1:	B
Q2:	Q2:	B	Q2:	C	Q2:	B
Q3:	Q3:	A	Q3:	C	Q3:	A
Q4:	Q4:	C	Q4:	A	Q4:	B
Q5a:	Q5:	C	Q5:	B	Q5:	A
Q5b:	Q6:	B	Q6:	B	Q6:	B
Q6:						

Wildlife Habitat:	The wetland provides diverse wildlife habitat.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	N/A
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	LI-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides diverse wildlife habitat.	Two or more Cowardin wetland classes. Emergent veg. or wet meadow. Moderate degree of Cowardin class interspersion. Between 0.5 and 1 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Exclusive Forest use or Open Space within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Exclusive Forest use or Open Space within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. and ponding,or open water only are the dominant cover types.
Enhancement Potential	N/A	

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	LI-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Results of wildlife habitat and fish habitat assessment criteria prove wetland provides diverse Wildlife Habitat, or Fish Habitat function is intact. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides diverse wildlife habitat. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/16/98

Wetland Mapping Code: LI-3

Investigator(s): CM/DG

Size (acres): 0.8

Location

Legal: T2S R2E S28

Other: N of Livesay Rd., S of Holcomb Rd.

Basin: Livesay Creek

Soils

Mapped Series: 37C, 92F

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): RSB

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
			Pteridium aquilinum
			Equisetum arvense
			Carex deweyana

Comments:

This is an intermittant stream with very steep slopes on either side. The stream is well-shaded by bigleaf maple (Acer macrophyllum) and Douglas-fir (Pseudotsuga menziesii). The streambed is not scoured substantially; therefore, it doesn't appear that it is significantly inundated during the wet months of the year. Hiking trails with directional signs constructed in the past are becoming overgrown. The source of water is mostly surface flow, with some shallow groundwater contribution.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: LI-3 Plot: 40

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Upslope to north of stream channel; SE of Holcomb Rd./Swan Ave.

Project #: 7971165 Determined by: CM/DG Date: 7/16/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		Ind.	%Cover: 10
Tellima grandiflora		UPL	40
Tolmiea menziesii		FAC	40
Pteridium aquilinum		FACU	10
Polystichum munitum		FACU	10
Woody Vine Stratum - % total cover:			**20**
Rubus discolor		FACU	100

Shrub/Sapling Stratum - % total cover:	Ind.	%Cover: 10
Oemleria cerasiformis	FACU	40
Sambucus racemosa	FACU	30
Rubus spectabilis	FAC+	30
Tree Stratum - % total cover:		**60**
Acer macrophyllum	FACU	60
Alnus rubra	FAC	20
Pseudotsuga menziesii	FACU	20

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 3 of 9 = 33 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Xerochrepts and Haploxerolls
Drainage Class: Well drained
Taxonomy: Xerochrepts and Haploxerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-6	10 YR 4/2		Silt loam
	6-14	10 YR 4/3	mottles	Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? No

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: LI-3 Plot: 41

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Bottom of drainage toe of steeply sloped banks; SE of Holcomb Rd./Swan Ave.

Project #: 7971165 Determined by: CM/DG Date: 7/16/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ **Vegetation** ☐ **Hydrology** ☐ **significantly disturbed?** No

VEGETATION Dominant Plant Species

		Ind. %Cover:
Herb Stratum - % total cover:		100
Pteridium aquilinum	FACU	75
Equisetum arvense	FAC	20
Carex deweyana	FACU	5
Shrub/Sapling Stratum - % total cover:		0
Woody Vine Stratum - % total cover:		0
Tree Stratum - % total cover:		0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 1 of 2 = 50 % (50/20 Rule)

Remarks: Rubus discolor on banks. Lots of bare soil.

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Xerochrepts + Haploxerolls

Drainage Class: Well drained

Taxonomy: Xerochrepts and Hoploxerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-3	10 YR 4/1	mottles	Silt loam
	3-17+	10 YR 4/1	mottles	Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☑ Sulfidic odor ☑ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 1" Depth to saturation: Surface

Primary Indicators:

☐ Inundated

☑ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☑ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/16/98	Investigator(s):	CM/DG
Project Name:	City of Oregon City		
WetlandCode:	LI-3	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:	A	Q1:		Q1:	C	Q1:	A	Q1:	B
Q2:	A	Q2:	A	Q2:		Q2:	C	Q2:	C	Q2:	B
Q3:	C	Q3:	C	Q3:		Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	B	Q4:	C	Q4:	C
Q5:	A	Q5:	C	Q5:		Q5:	C	Q5:	A	Q5:	C
Q6:	A	Q6:	C	Q6:		Q6:	C	Q6:	C	Q6:	A
Q7:	A							Q7:	C		
Q8:	A										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	B	Q1:	C
Q2:	B	Q2:	B	Q2:	C	Q2:	C
Q3:		Q3:	B	Q3:	B	Q3:	A
Q4:	C	Q4:	B	Q4:	B	Q4:	A
Q5a:		Q5:	B	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is lost or not present.
Hydrologic Control:	The wetland's hydrologic control function is lost or not present.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	LI-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	More than 75% of stream shaded by riparian vegetation. Stream channel natural/returning to natural physical character. Stream contains less than 10% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. No fish species present during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is lost or not present.	Groundwater (including seeps and springs) is wetland's primary source of water. No evidence of flooding or ponding during the growing season. Moderate (approx. 60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Exclusive Forest use or Open Space within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is lost or not present.	All or part of wetland located within 100-year floodplain or enclosed basin. No evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Waterflow out of wetland is unrestricted. Woody vegetation is dominant cover type. Exclusive Forest Use or Open Space within 500 ft of wetland on downstream or down-slope edge of wetland. Forested or natural area land use upstream.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Exclusive

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	LI-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Forest use or Open Space within 500 feet of wetland's edge. Dominant Exclusive Forest use or Open Space. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is groundwater, including springs and seeps. Wetland's area is less than 0.5 acre. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, but observation of other features can be made. There is an unmaintained access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is an unmaintained public access point within 250 feet of the wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. Existing undeveloped trails and viewing ares to guide user. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

CITY OF OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 6/27/97

Wetland Mapping Code: LI-4

Investigator(s): JF/DC

Size (acres): 1.3

Location

Legal: T2S R2E S28

Other: S of bend of Holcomb Rd, N of Livesay Rd.

Basin: Livesay Creek

Soils

Mapped Series: 78C, 78D, 92F

Hydrology

Hydrologic Source: Surface flow; sheet flow

Wetland Classification(s): PFO, PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia	*Symphoricarpos albus*		*Holcus lanatus*
Alnus rubra			*Agrostis tenuis*

Comments:

The wetland is a wet meadow in a gently sloping swale adjacent to an intermittent drainage. The intermittent drainage flows into the northern end of the wetland. Water from the wet meadow flows in a confined channel in shrubs and trees. Past disturbance (clearing, road development, two culverts, blackberry thickets) is evident around the drainage. Water from the southern end of the drainage flows in a culvert with an outlet that has a 3-foot drop into Livesay Creek and joins LI-5 and LI-2. Most of this drainage flows through relatively undeveloped parcels.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: LI-4 Plot: 14

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography E of intersection of Holcomb Blvd. & Longview Way, in swale adjacent to intermittent drainageway.

Project #: 7971165 Determined by: JF/DC Date: 6/27/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? No

Explanation: Site is currently used for livestock pasture

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover:** 100
Holcus lanatus	FAC	50
Agrostis tenuis	FAC	20
Veronica americana	OBL	10
Alopecurus geniculatus	OBL	10
Ranunculus repens	FACW	10

Shrub/Sapling Stratum - % total cover: **0** **Ind. %Cover:**

Woody Vine Stratum - % total cover: **0**

Tree Stratum - % total cover: **0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 2 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Saum silt loam
Drainage Class: Well drained
Taxonomy: Fine, mixed, mesic Typic Xerumbrepts

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"+	10 YR 4/1	mottles many, small, 7.5 YR 4/4	Silty clay loam

☐ Histosol ☑ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 8" Depth to saturation: Surface

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☑ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: LI-4 Plot: 15

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography E of intersection of Holcomb Blvd. And Longview Way, just north of drainage swale.

Project #: 7971165 Determined by: JF/DC Date: 6/27/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? No

Explanation: Site is currently used for livestock pasture.

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover:** 90
Festuca rubra	FAC+	30
Festuca arundinacea	FAC-	20
Dactylis glomerata	FACU	15
Vicia sativa	UPL	10
Anthoxanthum odoratum	FACU	10
Holcus lanatus	FAC	10
Galium boreale	FACU	5

Shrub/Sapling Stratum - % total cover:		**Ind. %Cover:** 0

Woody Vine Stratum - % total cover: 0

Tree Stratum - % total cover:		100
Quercus garryana	UPL	10

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 1 of 2 = 50 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Saum silt loam
Drainage Class: Well drained
Taxonomy: Fine, mixed, mesic Typic Xerumbrepts

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"+	10 YR 3/3		Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? No

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	6/27/97	Investigator(s):	DC/JF
Project Name:	City of Oregon City		
WetlandCode:	LI-4a,b	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:	A	Q1:		Q1:	A	Q1:	B	Q1:	B
Q2:	C	Q2:	B	Q2:		Q2:	C	Q2:	C	Q2:	B
Q3:	C	Q3:	C	Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:	C	Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	A	Q6:	C	Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	C	Q1:	C
Q2:	A	Q2:	A	Q2:	C	Q2:	C
Q3:	A	Q3:	B	Q3:	C	Q3:	A
Q4:	C	Q4:	A	Q4:	B	Q4:	A
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	LI-4a,b	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	More than 75% of stream shaded by riparian vegetation. Portions of stream channel modified. Stream contains less than 10% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. No fish species present during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. No evidence of flooding or ponding during the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. No evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	LI-4a,b	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is less than 0.5 acre. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/16/98

Wetland Mapping Code: LI-5

Investigator(s): CM/DG

Size (acres): 0.5

Location

Legal: T2S R2E S28

Other: N of Livesay Rd., S of Holcomb Rd.

Basin: Livesay Creek

Soils

Mapped Series: 78C, 92F

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PFO, PEM, RSB

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Alnus rubra	*Rubus spectabilis*		*Ranunculus repens*
	Acer circinatum		*Pteridium aquilinum*
			Tolmiea menziesii
			Polystichum munitum
			Carex sp.
			Agrostis tenuis

Comments:

The wetland is at the bottom of a steeply sloped drainage channel. This area is an intermittant stream with a combination of surface and shallow groundwater sources. It is well-shaded by red alder (Alnus rubra) and bigleaf maple (Acer macrophyllum). The channel contains some large woody debris consisting of large trees that were uprooted during the flood of 1996. Well-marked hiking trails were established in the past but are becoming overgrown.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: LI-5 Plot: 42

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Bottom of deep ravine; rel. flat bank adj to H2O; SE of Holcomb Rd./Swan Ave.

Project #: 7971165 Determined by: CM/DG Date: 7/16/98

DETERMINATION: IS THIS PLOT IN A WETLAND? Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		**30**
Ranunculus repens	FACW	35
Pteridium aquilinum	FACU	20
Tolmiea menziesii	FAC	15
Polystichum munitum	FACU	10
Carex sp.	FACW	10
Agrostis tenuis	FAC	10
Woody Vine Stratum - % total cover:		**0**

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		**40**
Rubus spectabilis	FAC+	90
Thuja plicata	FAC	10
Tree Stratum - % total cover:		**30**
Alnus rubra	FAC	100

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 3 of 4 = 75 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Xerochrepts and Haploxerolls
Drainage Class: Well drained
Taxonomy: Xerochreptst and Haploxerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
c	0-14	10 YR 4/2	mottles common, medium/fine	Silt loam, many cobbles

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Remarks: Excavation refusal @ 14" due to cobbles

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 4" Depth to saturation: Surface

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: LI-5 Plot: 43

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography SE of Holcomb Rd./Swan Ave.

Project #: 7971165 Determined by: CM/DG Date: 7/16/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**30**	**Shrub/Sapling Stratum** - % total cover:		**50**
Tolmiea menziesii	FAC	50	*Rubus spectabilis*	FAC+	70
Urtica dioica	FAC+	20	*Acer circinatum*	FAC-	30
Pteridium aquilinum	FACU	20			
Equisetum arvense	FAC	10			
Woody Vine Stratum - % total cover:		**0**	**Tree Stratum** - % total cover:		**20**
			Alnus rubra	FAC	100

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 6 = 67 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Xerochrepts and Haploxerolls
Drainage Class: Well drained
Taxonomy: Xerochrepts and Haploxerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-8	10 YR 3/2		Silt loam
	8-16	10 YR 4/3	mottles	Silt

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Remarks: Slightly moist

Hydrology Criterion Met? No

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/16/98	Investigator(s):	CM/DG
Project Name:	City of Oregon City		
WetlandCode:	LI-5	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:	A	Q1:		Q1:	C	Q1:	A	Q1:	B
Q2:	A	Q2:	A	Q2:		Q2:	C	Q2:	C	Q2:	B
Q3:	C	Q3:	C	Q3:		Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	B	Q4:	C	Q4:	C
Q5:	A	Q5:	A	Q5:		Q5:	C	Q5:	A	Q5:	C
Q6:	A	Q6:	C	Q6:		Q6:	C	Q6:	C	Q6:	A
Q7:	A							Q7:	A		
Q8:	A										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	B	Q1:	B	Q1:	C
Q2:	B	Q2:	B	Q2:	C	Q2:	C
Q3:		Q3:	B	Q3:	B	Q3:	A
Q4:	C	Q4:	B	Q4:	B	Q4:	A
Q5a:		Q5:	B	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is lost or not present.
Hydrologic Control:	The wetland's hydrologic control function is lost or not present.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	LI-5	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	More than 75% of stream shaded by riparian vegetation. Stream channel natural/returning to natural physical character. Stream contains less than 10% of instream structures. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 ft of wetland edge. No fish species present during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is lost or not present.	Groundwater (including seeps and springs) is wetland's primary source of water. No evidence of flooding or ponding during the growing season. Moderate (approx. 60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Exclusive Forest use or Open Space within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is lost or not present.	All or part of wetland located within 100-year floodplain or enclosed basin. No evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Waterflow out of wetland is unrestricted. Woody vegetation is dominant cover type. Exclusive Forest Use or Open Space within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Exclusive

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	LI-5	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Forest use or Open Space within 500 feet of wetland's edge. Dominant Exclusive Forest use or Open Space. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is groundwater, including springs and seeps. Wetland's area is less than 0.5 acre. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation, but allowed only with permission. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, but observation of other features can be made. There is an unmaintained access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is an unmaintained public access point within 250 feet of the wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. Existing undeveloped trails and viewing ares to guide user. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/24/98 **Wetland Mapping Code:** MU-1

Investigator(s): KC/PO **Size (acres):** 0.2

Location

Legal: T3S R2E S6

Other: Between Central Point and Leland Rds.

Basin: Mud Creek

Soils

Mapped Series: 24B

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PSS

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
	Cytisus scoparius	*Rubus discolor*	*Juncus effusus*
	Crataegus monogyna		*Holcus lanatus*
			Carex unilateralis
			Agrostis stolonifera
			Juncus acuminatus
			Chrysanthemum leucanthemum

Comments:

This wetland is a low-lying area south of a mobile home park and consists of a matrix of upland and wetland areas. Himalayan blackberry (Rubus discolor) dominates, nearly forming a monoculture. Drainage patterns throughout the complex indicate the northeast flow toward a series of ditches. Access to the site is limited because of the blackberry. The riparian area to the south and southeast is dominated by scrub/shrub and tree species.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: MU-1 Plot: 50

T 3S R 2E S 6 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Low-lying area south of mobile home park; SW of Leland/Warner-Milne Rds.

Project #: 7971165 Determined by: KC/PO Date: 7/20/98

DETERMINATION: IS THIS PLOT IN A WETLAND? Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover: 100**
Agrostis stolonifera	FAC	30
Carex unilateralis	FACW	20
Holcus lanatus	FAC	20
Juncus effusus	FACW	20
Juncus acuminatus	OBL	15
Chrysanthemum leucanthemum	UPL	5

Shrub/Sapling Stratum - % total cover:		**Ind. %Cover: 20**
Cytisus scoparius	UPL	85
Crataegus monogyna	FACU	15

Woody Vine Stratum - % total cover:		**30**
Rubus discolor	FACU	100

Tree Stratum - % total cover: **0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 6 = 67 % (50/20 Rule)

Remarks: Bordered by grove of Crategus doug, + another of Pseudotsga menziesii.

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Cottrell silty clay loam
Drainage Class: Deep, moderately well drained
Taxonomy: Clayey, mixed, mesic Aquic Haplohumults

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"	10 YR 3/2	mottles few, faint, 10 YR 5/8, concretions	Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☑ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☑ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/20/98	Investigator(s):	KC/PO
Project Name:	City of Oregon City		
WetlandCode:	MU-1	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:		Q1:		Q1:	B	Q1:	B	Q1:	A
Q2:	C	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	B	Q5:		Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	B										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	A	Q1:	C
Q2:	C	Q2:	A	Q2:	C	Q2:	B
Q3:		Q3:	B	Q3:	C	Q3:	A
Q4:	B	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	B	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Precipitation or sheet flow is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		habitat, water quality and hydrologic control. Wetland's primary source of water is precipitation or sheet flow. Wetland's area is between 0.5 and 5 acres. Between 10 and 40 % of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/21/98

Wetland Mapping Code: MU-2

Investigator(s): KC/PO

Size (acres): 0.2

Location

Legal: T3S R2E S6

Other: E of Leland Rd., W of Kaen Rd.

Basin: Mud Creek

Soils

Mapped Series: 8B

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PEM, RSB

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Populus balsamifera	*Populus trichocarpa* *Spiraea douglasii*	*Rubus discolor*	*Festuca arundinacea* *Agrostis stolonifera* *Holcus lanatus*

Comments:

The wetland area is confined to a gently sloped channel dominated by young black cottonwood trees (Populus balsamifera) and Douglas' spirea (Spirea douglasii). The flow in the channel is intermittent from surface flow. The adjacent land is a mowed pasture, which provides no buffer for the small wetland area. The wetland is upstream from many wetland systems associated with the stream. The water flowing through the system passes through many culverts.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: MU-2 Plot: 51

T 3S R 2E S 6 City: Oregon City County: Clackamas State: OR

Plot Location; Topography In confined ditch SE of Leland/Warner-Milne Rds.

Project #: 7971165 Determined by: KC/PO Date: 7/20/98

DETERMINATION: IS THIS PLOT IN A WETLAND? Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:		Ind.	%Cover:
Herb Stratum - % total cover:		**100**	**Shrub/Sapling Stratum** - % total cover:		**20**
Festuca arundinacea	FAC-	70	*Populus trichocarpa*	FAC	75
Agrostis stolonifera	FAC	20	*Spiraea douglasii*	FACW	25
Holcus lanatus	FAC	10			
Woody Vine Stratum - % total cover:		**5**	**Tree Stratum** - % total cover:		**0**
Rubus discolor	FACU	100			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 3 of 5 = 60 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Cottrell silty clay loam

Drainage Class: Deep moderately well drained

Taxonomy: Clayey, mixed, mesic Aquic Haplohumults

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-6"	10 YR 2/1	no mottles	Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >6" Depth to saturation: >6"

Primary Indicators:

☐ Inundated

☐ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☑ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Remarks: Gravel at 6".

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/20/98	Investigator(s):	KC/PO
Project Name:	City of Oregon City		
Wetland Code:	MU-2	Project Number:	7971165

Wildlife Habitat		Fish Habitat - Streams		Fish Habitat - Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:		Q1:		Q1:	B	Q1:	B	Q1:	A
Q2:	C	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	B										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	A	Q1:	C
Q2:	C	Q2:	A	Q2:	C	Q2:	B
Q3:		Q3:	B	Q3:	C	Q3:	C
Q4:	B	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	B	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Precipitation or sheet flow is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		habitat, water quality and hydrologic control. Wetland's primary source of water is precipitation or sheet flow. Wetland's area is between 0.5 and 5 acres. Between 10 and 40 % of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/20/98

Wetland Mapping Code: MU-3

Investigator(s): KC/PO

Size (acres): 0.4

Location

Legal: T3S R2E S8

Other: Hillendale Park, Clairmont Rd.

Basin: Mud Creek

Soils

Mapped Series: 24B

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
			Lotus corniculatus
			Carex obnupta
			Carex feta
			Holcus lanatus
			Agrostis stolonifera

Comments:

This wetland is an emergent system adjacent to a channelized stream. The wetland provides the stream with a floodplain during high flow. Songbirds and small mammals use the wetland and the adjacent stream for foraging and nesting. The wetland is upstream from two open water wetlands in a city park. Access is limited, as the wetland is adjacent to a prison and animal control facility.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: MU-3 Plot: 52

T 3S R 2E S 8 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Low-lying area west of Hillendale Park.

Project #: 7971165 Determined by: KC/PO Date: 7/20/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		100
Holcus lanatus	FAC	30
Lotus corniculatus	FAC	30
Carex feta	FACW	20
Carex stipata	OBL	15
Agrostis stolonifera	FAC	5
Woody Vine Stratum - % total cover:		0

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		0
Tree Stratum - % total cover:		0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 3 of 3 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Cottrell silty clay loam
Drainage Class: Deep, moderately well drained
Taxonomy: Clayey, mixed, mesic Aquic Haplohumults

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-10"	10 YR 3/1	mottles abundant, small, 10 YR 5/6	Silt loam
	10-18"	10 YR 5/1	mottles abundant, medium, 10 YR 4/6	Silty clay loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: 18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☑ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:
☐ Local soil survey data
☐ FAC-Neutral test

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/20/98	Investigator(s):	KC/PO
Project Name:	City of Oregon City		
WetlandCode:	MU-3	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	C	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	C
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	B										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	A	Q1:	B
Q2:	A	Q2:	A	Q2:	C	Q2:	A
Q3:	C	Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	A	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	B	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has little enhancement potential.
Education:	The wetland has educational uses.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Minor restrictions slow down waterflow out of the wetland. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. and ponding,or open water only are the dominant cover types.
Enhancement Potential	The wetland has little enhancement potential.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is restricted and cannot be restored. Wetland's area is less than 0.5 acre. Between 10 and 40 % of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has educational uses.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/20/98

Wetland Mapping Code: MU-4

Investigator(s): KC/PO

Size (acres): 1.1

Location

Legal: T3S R2E S8

Other: Hillendale Park, Clairmont Rd.

Basin: Mud Creek

Soils

Mapped Series: 24B

Hydrology

Hydrologic Source: Surface flow; groundwater

Wetland Classification(s): PEM, POW

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia	*Spiraea douglasii*		*Typha latifolia*
Populus balsamifera			*Juncus effusus*
Salix lasiandra			*Carex obnupta*
			Carex feta
			Sparganium androcladum
			Lotus corniculatus
			Phalaris arundinacea
			Ludwigia palustris

Comments:

This wetland is in a city park and is well maintained and landscaped to its edge. There is no vegetated buffer. It is approximately 0.3 acre and includes a channelized stream that connects it to other wetland systems both upstream and downstream. Many bullfrog tadpoles (Rana catesbiena) were observed throughout the wetland area. Children were also observed using the site.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/20/98	Investigator(s):	KC/PO
Project Name:	City of Oregon City		
WetlandCode:	MU-4	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:		Q1:	A	Q1:	A	Q1:	A
Q2:	C	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	C	Q4:	B	Q4:	C
Q5:	A	Q5:		Q5:		Q5:	C	Q5:	B	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	C	Q6:	C
Q7:	A							Q7:	A		
Q8:	A										
Q9a:											
Q9b:	C										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	A	Q1:	B
Q2:	A	Q2:	B	Q2:	C	Q2:	B
Q3:	C	Q3:	B	Q3:	A	Q3:	A
Q4:	B	Q4:	A	Q4:	B	Q4:	C
Q5a:		Q5:	A	Q5:	B	Q5:	B
Q5b:	C	Q6:	A	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has little enhancement potential.
Education:	The wetland has potential for educational use.
Recreation:	The wetland provides recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Less than 0.5 acre and wetland is not connected to other wetland within a 3 mile radius. Exclusive Forest use or Open Space within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Emergent veg. and ponding , or open water only is dominant cover type. Exclusive Forest Use or Open Space within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Exclusive Forest use or Open Space within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. and ponding,or open water only are the dominant cover types.
Enhancement Potential	The wetland has little enhancement potential.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is restricted and cannot be restored. Wetland's area is between 0.5 and 5 acres. Less than 10% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is a maintained public access point within 250 feet of the wetland's edge. Access is available for limited mobility.
Recreation	The wetland provides recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. Existing developed and maintained trails and viewing areas to guide user. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is developed with no landscaping. At certain times, unpleasant odors are present at the primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/20/98

Wetland Mapping Code: MU-5

Investigator(s): KC/PO

Size (acres): 0.2

Location

Legal: T3S R2E S8

Other: North of Meyers Rd. at Autumn Lane

Basin: Mud Creek

Soils

Mapped Series: 24B

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PSS, PFO

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia	*Acer macrophyllum*	*Rubus discolor*	*Festuca arundinacea*
Salix lasiandra			*Phalaris arundinacea*
			Epilobium watsonii
			Callitriche stagnalis
			Juncus effusus

Comments:

The wetland consists of a channelized stream with aproximately 60% tree cover in the riparian area and an associated wetland floodplain with mostly herbaceous cover. The stream flows into a constructed pond area of less than 0.5 acre, then continues south, east of land that is currently being developed for single-family homes. In some areas, construction grading has removed riparian vegetation, which is causing erosion and increased runoff into the stream. The emergent wetland area appears to have been delineated recently, and may be proposed for development. It is likely that a variety of wildlife species use the stream corridor and associated wetland and open water areas, because of the variety of habitat and the connectivity of forested and open areas adjacent to the stream. The stream is highly modified upstream.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/20/98	Investigator(s):	KC/PO
Project Name:	City of Oregon City		
WetlandCode:	MU-5	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:		Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	A	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:		Q3:		Q3:		Q3:	A	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	C										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	C	Q1:	C
Q2:	A	Q2:	B	Q2:	C	Q2:	A
Q3:	C	Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	C	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has little enhancement potential.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-5	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Woody vegetation is dominant vegetation cover. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Minor restrictions slow down waterflow out of the wetland. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has little enhancement potential.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-5	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		flow, including streams and ditches. Water flow into wetland is restricted and cannot be restored. Wetland's area is less than 0.5 acre. Less than 10% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/20/98

Wetland Mapping Code: MU-6

Investigator(s): KC/PO

Size (acres): 1.2

Location

Legal: T3S R2E S7, 8

Other: S of Meyers Road

Basin: Mud Creek

Soils

Mapped Series: 24B, 78E

Hydrology

Hydrologic Source: Suface flow

Wetland Classification(s): POW, PFO

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Alnus rubra	*Rubus spectabilis*		*Juncus effusus*
Populus trichocarpa			*Eleocharis ovata*
Salix fluviatilis			*Myosotis laxa*
			Veronica americana
			Glyceria elata
			Carex stipata
			Scirpus microcarpus
			Phalaris arundinacea

Comments:

The wetland area is a manmade pond fed by Mud Creek. Mud Creek flows south from MU 4 and 5, and southeast from MU 6 and 7. Many trees were removed on the western side of the pond during recent development and construction grading activities. The pond probably provides habitat for small fish and amphibians and drinking water for many small mammals. Many songbirds were observed using the site.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: MU-6 Plot: 53

T 3S R 2E S 8 City: Oregon City County: Clackamas State: OR

Plot Location; Topography SE of intersection of Meyers Rd. & Autumn Lane

Project #: 7971165 Determined by: KC/PO Date: 7/20/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover: 100**
Juncus effusus	FACW	60
Eleocharis ovata	OBL	20
Phalaris arundinacea	FACW	10
Glyceria elata	FACW	10
Scirpus microcarpus	OBL	5
Carex stipata	OBL	5
Veronica americana	OBL	5
Myosotis laxa	OBL	5

Shrub/Sapling Stratum - % total cover:		**Ind. %Cover: 20**
Rubus spectabilis	FAC+	20

Woody Vine Stratum - % total cover:

Tree Stratum - % total cover:		**20**
Populus trichocarpa	FAC	70
Salix fluviatilis	OBL	15
Alnus rubra	FAC	15

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 4 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Cottrell silty clay loam
Drainage Class: Deep, moderately well drained
Taxonomy: Clayey, mixed, mesic Aquic Haplohumults

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-16"	10 YR 3/1	no mottles	Clayey silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 6" Depth to saturation: Surface

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/20/98	Investigator(s):	KC/PO
Project Name:	City of Oregon City		
WetlandCode:	MU-6	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:	A	Q1:	A	Q1:	B	Q1:	A
Q2:	B	Q2:		Q2:	B	Q2:	A	Q2:	A	Q2:	B
Q3:	B	Q3:		Q3:	B	Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:	A	Q4:	B	Q4:	A	Q4:	A
Q5:	A	Q5:		Q5:	C	Q5:	A	Q5:	B	Q5:	A
Q6:	A	Q6:		Q6:	C	Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	C	Q1:	B
Q2:	A	Q2:	B	Q2:	C	Q2:	A
Q3:	C	Q3:	B	Q3:	C	Q3:	C
Q4:	B	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	The wetland's fish habitat function is impacted or degraded.
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-6	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. & ponding or open water only. Moderate degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	The wetland's fish habitat function is impacted or degraded.	More than 75% of stream shaded by riparian vegetation. Portions of stream channel modified. Stream contains between 10 and 25% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. No fish species present during the year.
Water Quality	The wetland's water quality function is intact.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Waterflow out of wetland is restricted or no outlet. Emergent veg. and ponding , or open water only is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-6	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is restricted and cannot be restored. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-6	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/21/98

Wetland Mapping Code: MU-8

Investigator(s): KC/PO

Size (acres): 0.5

Location

Legal: T3S R2E S7

Other: W of Leland Rd.

Basin: MudCreek

Soils

Mapped Series: 24B

Hydrology

Hydrologic Source: Sheet flow

Wetland Classification(s): PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
			mowed pasture grasses

Comments:

This seasonal wetland swale is dominated by mowed pasture grasses. All native vegetation has been removed; however, there is a noticeable vegetation break in the depression. This area is connected to a ditch approximately 25 feet to the northeast. The primary source of water is probably surface runoff from adjacent single-family homes. There were no indicators of wildlife use.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: MU-8 Plot: 54

T 3S R 2E S 7 City: Oregon City County: Clackamas State: OR

Plot Location; Topography In mowed field NE of intersection of Leland and McCord Rds.

Project #: 7971165 Determined by: KC/PO Date: 7/21/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? No

Are Soils ☐ Vegetation ☑ Hydrology ☐ significantly disturbed? Yes

Explanation: Mowed field.

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		**100**
Festuca arundinacea	FAC-	100
Woody Vine Stratum - % total cover:		**0**

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		**0**
Tree Stratum - % total cover:		**0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 0 of 1 = 0 % (50/20 Rule)

Remarks: Mowed pasture , all native veg. Removed. Noticeable veg. Break, depression connected to other drainage

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Cottrell silty clay loam

Drainage Class: Deep, moderately well drained

Taxonomy: Clayey, mixed, mesic Aquic Haplohumults

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"	10 YR 2/1	no mottles	Silt loam, friable

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:

☐ Inundated

☐ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☑ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/21/98	Investigator(s):	KC/PO
Project Name:	City of Oregon City		
WetlandCode:	MU-8	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	C	Q1:		Q1:		Q1:	B	Q1:	B	Q1:	A
Q2:	C	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	C	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	C
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	C										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	C	Q1:	C
Q2:	C	Q2:	A	Q2:	C	Q2:	A
Q3:		Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	C	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has little enhancement potential.
Education:	The wetland has potential for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-8	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with 5 or fewer plant species. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Precipitation or sheet flow is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Low (<60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Minor restrictions slow down waterflow out of the wetland. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. and ponding,or open water only are the dominant cover types.
Enhancement Potential	The wetland has little enhancement potential.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	MU-8	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		habitat, water quality and hydrologic control. Wetland's primary source of water is precipitation or sheet flow. Wetland's area is less than 0.5 acre. Less than 10% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

CITY OF OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 8/14/97

Wetland Mapping Code: NE-1

Investigator(s): DC/CM

Size (acres): 0.9

Location

Legal: T3S R2E S5

Other: East of Mollala Ave., S of Barclay Rd.

Basin: Newell Creek

Soils

Mapped Series: 92F

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PEM, PFO, RSB

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Alnus rubra		*Rubus discolor*	*Veronica americana*
Acer macrophyllum			*Holcus lanatus*
			Stachys cooleyae
			Epilobium watsonii
			Polystichum munitum

Comments:

This is a fringe wetland adjacent to deeply cut streams along forested hillside slopes. These stream are tributaries of the main stem of Newell Creek and have no known upstream blockages. The soils appear unstable, with evidence of slides in some areas. The vegetative cover consists of a tree canopy with forest undergrowth. The streams are seasonal in nature.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: NE-1 Plot: 20

T 3S R 2E S 5 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Hillside seep in depression at top end of stream. Mountain View Cemetary

Project #: 7971165 Determined by: DC/CM Date: 8/14/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		**80**
Veronica americana	OBL	20
Holcus lanatus	FAC	20
Stachys cooleyae	FACW	20
Epilobium watsonii	FACW	20
Juncus effusus	FACW	5
Scirpus microcarpus	OBL	5
Equisetum arvense	FAC	5
Woody Vine Stratum - % total cover:		**0**

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		**0**
Tree Stratum - % total cover:		**20**
Alnus rubra	FAC	100

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 5 of 5 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Xerochrepts and Haploxerolls
Drainage Class: Well drained
Taxonomy: Xerochrepts and Haploxerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-9"	10 YR 3/2	mottles faint, 10 YR 3/4	Silt loam
	9-11"		Stains on ped faces, 7.5 YR 3/3	Friable silt loam
	11-	10 YR 3/2		

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation 1" Depth to water table: inundated Depth to saturation: Surface

Primary Indicators:
☑ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☑ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: NE-1 Plot: 21

T 3S R 2E S 5 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Upslope to north of data plot 20. Mountain View Cemetary

Project #: 7971165 Determined by: DC/CM Date: 8/14/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		**5**
Polystichum munitum	FACU	50
Holcus lanatus	FAC	50
Woody Vine Stratum - % total cover:		**60**
Rubus discolor	FACU	100
Shrub/Sapling Stratum - % total cover:		**0**
Tree Stratum - % total cover:		**80**
Acer macrophyllum	FACU	50
Alnus rubra	FAC	50

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 5 = 40 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Xerochrepts and Haploxerolls
Drainage Class: Well drained
Taxonomy: Xerochrepts and Haploxerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18+"	7.5 YR 3/3		Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? No

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/9/97	Investigator(s):	CM/DC
Project Name:	City of Oregon city		
WetlandCode:	NE-1	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:	B	Q1:		Q1:	A	Q1:	A	Q1:	A
Q2:	C	Q2:	B	Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:	C	Q3:		Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	C	Q4:	C	Q4:	C
Q5:	A	Q5:	A	Q5:		Q5:	C	Q5:	C	Q5:	C
Q6:	A	Q6:	C	Q6:		Q6:	C	Q6:	B	Q6:	B
Q7:	A							Q7:	A		
Q8:	A										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	C	Q1:	C
Q2:	A	Q2:	B	Q2:	C	Q2:	C
Q3:	A	Q3:	B	Q3:	C	Q3:	B
Q4:	C	Q4:	C	Q4:	B	Q4:	A
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	Between 50 and 75% of stream shaded by riparian vegetation. Portions of stream channel modified. Stream contains less than 10% of instream structures. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 ft of wetland edge. No fish species present during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Moderate (approx. 60%) degree of wetland vegetation cover. Less than 0.5 acre and wetland is not connected to other wetland within a 3 mile radius. Exclusive Forest use or Open Space within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Waterflow out of wetland is unrestricted. Emergent veg. or wet meadow is dominant cover type. Agricultural land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Exclusive Forest use or Open Space within 500 feet of

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		wetland's edge. Dominant Exclusive Forest use or Open Space. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is less than 0.5 acre. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors, which can be removed easily. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

CITY OF OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 8/15/97

Wetland Mapping Code: NE-2

Investigator(s): DC/CM

Size (acres): 3

Location

Legal: T3S R2E S5

Other: SE of intersection of Warner-Milne and Kaen Roads

Basin: Newell Creek

Soils

Mapped Series: 7B, 8B

Hydrology

Hydrologic Source: Precipitation

Wetland Classification(s): PEM, PSS

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
	Spiraea douglasii		*Lotus corniculatus*

Comments:

This wetland occurs in a field. A thicket of Douglas' spirea (Spirea douglasii) dominates the low-lying, central portion of the wetland. A raccoon family was noted in a thicket.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: NE-2 Plot: 22

T 3S R 2E S 5 City: Oregon City County: Clackamas State: OR

Plot Location; Topography SE of intersection of Warner-Milne and Kaen Roads.

Project #: 7971165 Determined by: DC/CM Date: 8/15/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Comments: Plot dominated by FAC wetland plants but soil and hydrology criteria not met.

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover:** 100
Poa pratensis	FAC	20
Lotus corniculatus	FAC	20
Anthoxanthum odoratum	FACU	20
Holcus lanatus	FAC	20
Festuca arundinacea	FAC-	20
Equisetum arvense	FAC	5

Shrub/Sapling Stratum - % total cover:	**Ind. %Cover:** 0

Woody Vine Stratum - % total cover: 0

Tree Stratum - % total cover: 0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 3 of 5 = 60 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Bornstedt silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Typic Haploxerult

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"+	7.5 YR 3/2	Stains on peds at 8"	Silty clay loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? No

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: NE-2 Plot: 23

T 3S R 2E S 5 City: Oregon City County: Clackamas State: OR

Plot Location; Topography SE of intersection of Warner-Milne and Kaen Roads.

Project #: 7971165 Determined by: DC/CM Date: 8/15/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover: 60**
Lotus corniculatus	FAC	65
Phalaris arundinacea	FACW	15
Holcus lanatus	FAC	10
Cirsium arvense	FACU	5
Anthoxanthum odoratum	FACU	5

Shrub/Sapling Stratum - % total cover:		**Ind. %Cover: 40**
Spiraea douglasii	FACW	100

Woody Vine Stratum - % total cover: **0**

Tree Stratum - % total cover: **0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 2 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Bornstedt silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Typic Haploxerult

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-7 "	7.5 YR 3/2		Silt loam
	7-10"	10 YR 3/2	mottles few, medium, 7.5 YR 4/4, black stains on peds	Silt loam
	0-20"	10 YR 3/2	mottles many, fine-medium, 5 YR 4/4	Silty clay loam

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking
☐ Histic epipedon ☑ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: 10"

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☑ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:
☐ Local soil survey data
☐ FAC-Neutral test

Remarks: Hummocky surface.

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/9/97	Investigator(s):	CM/DG
Project Name:	City of Oregon city		
WetlandCode:	NE-2	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:		Q1:	C	Q1:	A	Q1:	B
Q2:	C	Q2:		Q2:		Q2:	B	Q2:	B	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	C	Q4:	B	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	B	Q1:	B	Q1:	A
Q2:	C	Q2:	A	Q2:	C	Q2:	A
Q3:	A	Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	A	Q4:	B	Q4:	C
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has little enhancement potential.
Education:	The wetland has potential for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Groundwater (including seeps and springs) is wetland's primary source of water. Unable to determine evidence of flooding or ponding during the growing season (or unapplicable). High (>60%) degree of wetland vegetation cover. Less than 0.5 acre and wetland is not connected to other wetland within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	All or part of wetland located within 100-year floodplain or enclosed basin. Unable to determine evidence of flooding or ponding during the growing season (or not applicable). Area is less than 0.5 acre. Minor restrictions slow down waterflow out of the wetland. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Enhancement Potential	The wetland has little enhancement potential.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is precipitation or sheet flow. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is less than 0.5 acre. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation, but allowed only with permission. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is an unmaintained public access point within 250 feet of the wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	More than two Cowardin classes are visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is developed with no landscaping. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

CITY OF OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 8/15/97

Wetland Mapping Code: NE-3

Investigator(s): DC/CM

Size (acres): 0.3

Location

Legal: T3S R2E S5

Other: SE of intersection of Warner-Milne and Kaen Roads

Basin: Newell Creek

Soils

Mapped Series: 7B

Hydrology

Hydrologic Source: Sheet flow

Wetland Classification(s): PSS

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Salix lasiandra		*Rubus discolor*	*Carex obnupta*
Prunus emarginata		*Rubus ursinus*	*Epilobium watsonii*
Rhamnus purshiana			*Athyrium filix-femina*
Crataegus monogyna			*Pteridium aquilinum*
Alnus rubra			

Comments:

This area was thick with woody growth. Residents noted ponded conditions early in the season. Hydromorphic adaptations were apparent in multiple and/or fluted trunks.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: NE-3 Plot: 24

T 3S R 2E S 5 City: Oregon City County: Clackamas State: OR

Plot Location; Topography SE of intersection of Warner-Milne and Kaen Roads.

Project #: 7971165 Determined by: DC/CM Date: 8/15/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:		Ind.	%Cover:
Herb Stratum - % total cover:		5	**Shrub/Sapling Stratum** - % total cover:		35
Pteridium aquilinum	FACU	100	*Alnus rubra*	FAC	10
Woody Vine Stratum - % total cover:		30	**Tree Stratum** - % total cover:		60
Rubus discolor	FACU	60	*Alnus rubra*	FAC	40
Rubus ursinus	FACU	30	*Rhamnus purshiana*	FAC-	35
			Crataegus monogyna	FACU	25

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 1 of 6 = 17 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Bornstedt silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Typic Haploxerult

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"+	7.5 YR 3/2		Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? No

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: NE-3 Plot: 25

T 3S R 2E S 5 City: Oregon City County: Clackamas State: OR

Plot Location; Topography SE of intersection of Warner-Milne and Kaen Roads.

Project #: 7971165 Determined by: DC/CM Date: 8/15/97

DETERMINATION: IS THIS PLOT IN A WETLAND? Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover: 50**
Carex obnupta	OBL	60
Epilobium watsonii	FACW	20
Athyrium filix-femina	FAC	20
Woody Vine Stratum - % total cover:		**0**

Shrub/Sapling Stratum - % total cover:		**Ind. %Cover: 50**
Physocarpus capitatus	FACW	60
Cornus sericea	FACW	40
Tree Stratum - % total cover:		**60**
Salix lasiandra	FACW	80
Prunus emarginata	FACU	20

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 6 of 7 = 71 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Bornstedt silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Typic Haploxerult

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-8"	10 YR 3/2	mottles, 7.5 YR 4/6	Silty clay loam
	8-18"	10 YR 4/1	mottles, 2.5 Y 4/3	Clay

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking
☐ Histic epipedon ☑ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 16" Depth to saturation: 4"

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☑ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:
☐ Local soil survey data
☐ FAC-Neutral test

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/9/97	Investigator(s):	CM/DG
Project Name:	City of Oregon city		
WetlandCode:	NE-3	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:		Q1:		Q1:	B	Q1:	B	Q1:	A
Q2:	A	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	C	Q4:	A	Q4:	A
Q5:	B	Q5:		Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	B	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	C										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	B	Q1:	A	Q1:	C
Q2:	C	Q2:	A	Q2:	C	Q2:	B
Q3:		Q3:	B	Q3:	B	Q3:	B
Q4:	C	Q4:	A	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	B
Q5b:	C	Q6:	A	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has little enhancement potential.
Education:	The wetland has potential for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland not connected to other wetlands, but within 3 mile radius of other wetlands. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Precipitation or sheet flow is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Less than 0.5 acre and wetland is not connected to other wetland within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Waterflow out of wetland is restricted or no outlet. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has little enhancement potential.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Wetland's primary source of water is precipitation or sheet flow. Wetland's area is less than 0.5 acre. Less than 10% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation, but allowed only with permission. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is a maintained public access point within 250 feet of the wetland's edge. Access is available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. Existing undeveloped trails and viewing ares to guide user. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors, which can be removed easily. Visual character with surrounding area is landscaped or manipulated by people. At certain times, unpleasant odors are present at the primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

CITY OF OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/9/97

Wetland Mapping Code: NE-5

Investigator(s): DC/CM

Size (acres): 0.5

Location

Legal: T3S R2E S5

Other: N of Beavercreek Rd., between Hwy. 213 & Molalla Ave.

Basin: Newell Creek

Soils

Mapped Series: 37D, 92F

Hydrology

Hydrologic Source: Hilllside seeps; sheetflow

Wetland Classification(s): PSS, PEM, POW

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Alnus rubra	*Rubus spectabilis*		*Athyrium filix-femina*
Acer macrophyllum	*Sambucus racemosa*		*Hydrophyllum tenuipes*
	Oemleria cerasiformis		

Comments:

This wetland consists of a small pond fed by a short, seasonal stream/seep. The pond maintains several obligate wetland plant species; the stream channel is heavily vegetated with shrubs. Vegetation in the pond area is emergent, with a tree overstory.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: NE-5 Plot: 34

T 3S R 2E S 5 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Channel that feeds Clark Pond

Project #: 7971165 Determined by: DC/CM Date: 7/9/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		**15**
Athyrium filix-femina	FAC	60
Hydrophyllum tenuipes	UPL	30
Urtica dioica	FAC+	10
Woody Vine Stratum - % total cover:		**0**

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		**45**
Rubus spectabilis	FAC+	40
Sambucus racemosa	FACU	30
Oemleria cerasiformis	FACU	30
Tree Stratum - % total cover:		**40**
Alnus rubra	FAC	50
Acer macrophyllum	FACU	50

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 7 = 57 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Xerochrepts and Haploxerolls
Drainage Class: Well drained
Taxonomy: Xerochrepts and Haploxerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-4"	10 YR 2/1		Muck
	4-12"	10 YR 3/1		Clay
	12-	7.5 YR 4/3	mottles fine, frequent, 7.5 YR 4/4	Clay

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☑ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☑ Highly organic surface layer ☐ On hydric soils list

Remarks: Soil not typical of mapped unit.

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 4" Depth to saturation: Surface

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: NE-5 Plot: 35

T 3S R 2E S 5 City: Oregon City County: Clackamas State: OR

Plot Location; Topography South of channel that feeds Clark Pond.

Project #: 7971165 Determined by: DC/CM Date: 7/9/97

DETERMINATION: IS THIS PLOT IN A WETLAND? No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☑ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		30
Hydrophyllum tenuipes	UPL	60
Polystichum munitum	FACU	40
Woody Vine Stratum - % total cover:		0

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		30
Oemleria cerasiformis	FACU	80
Sambucus racemosa	FACU	20
Tree Stratum - % total cover:		40
Acer macrophyllum	FACU	100

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 0 of 5 = 0 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Xerochrepts and Haploxerolls
Drainage Class: Well drained
Taxonomy: Xerochrepts and Haploxerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"+	10 YR 2/2		Silty clay loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☑ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? No

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/9/97	Investigator(s):	CM/DC
Project Name:	City of Oregon city		
WetlandCode:	NE-5	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:	B	Q1:	A	Q1:	B	Q1:	B
Q2:	B	Q2:		Q2:	A	Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:	A	Q3:	A	Q3:	C	Q3:	C
Q4:	C	Q4:		Q4:	A	Q4:	C	Q4:	A	Q4:	C
Q5:	B	Q5:		Q5:	A	Q5:	C	Q5:	B	Q5:	A
Q6:	B	Q6:		Q6:	C	Q6:	C	Q6:	C	Q6:	C
Q7:	A							Q7:	A		
Q8:	A										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	B	Q1:	B
Q2:	A	Q2:	A	Q2:	C	Q2:	C
Q3:	A	Q3:	B	Q3:	B	Q3:	C
Q4:	C	Q4:	A	Q4:	B	Q4:	A
Q5a:		Q5:	B	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	The wetland's fish habitat function is impacted or degraded.
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-5	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. & ponding or open water only. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland not connected to other wetlands, but within 3 mile radius of other wetlands. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	The wetland's fish habitat function is impacted or degraded.	Between 50 and 75% of stream shaded by riparian vegetation. Stream channel natural/returning to natural physical character. Stream contains more than 25% of instream structures. Upstream not listed as water quality limited. Exclusive Forest use or Open Space within 500 ft of wetland edge. No fish species present during the year.
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Less than 0.5 acre and wetland is not connected to other wetland within a 3 mile radius. Exclusive Forest use or Open Space within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Waterflow out of wetland is restricted or no outlet. Emergent veg. and ponding , or open water only is dominant cover type. Exclusive Forest Use or Open Space within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has not been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Exclusive

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-5	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Forest use or Open Space within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. and ponding,or open water only are the dominant cover types.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is less than 0.5 acre. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is an unmaintained access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is an unmaintained public access point within 250 feet of the wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. Existing undeveloped trails and viewing ares to guide user. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-5	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/21/98

Wetland Mapping Code: NE-8

Investigator(s): KC/PO

Size (acres): 1

Location

Legal: T3S R2E S4

Other: NE of intersection of Hwy. 213 & Beavercreek Rd.

Basin: Newell Creek

Soils

Mapped Series: 8B

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PSS

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia	*Cornus sericea*	*Rubus discolor*	*Phalaris arundinacea*
Populus balsamifera	*Rubus spectabilis*	*Rubus laciniatus*	*Carex obnupta*
Alnus rubra		*Rubus ursinus*	*Solanum dulcamara*
			Carex deweyana
			Convolvulus arvensis
			Geum macrophyllum
			Holcus lanatus
			Epilobium watsonii

Comments:

Newell Creek meanders through backyards and culverts under streets. The vegetation is highly disturbed. Some evidence of flooding was noted.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: NE-8 Plot: 55

T 3S R 2E S 4 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Bank of stream N of Inskeep Environmental Learning Center

Project #: 7971165 Determined by: KC/PO Date: 7/21/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		Ind. %Cover: 70
Phalaris arundinacea	FACW	20
Carex obnupta	OBL	20
Solanum dulcamara	FAC+	10
Carex deweyana	FACU	10
Convolvulus arvensis	UPL	10
Geum macrophyllum	FACW	10
Holcus lanatus	FAC	10
Epilobium watsonii	FACW	5

Shrub/Sapling Stratum - % total cover:		Ind. %Cover: 15
Cornus Sericea	FACW	100

Woody Vine Stratum - % total cover:		30
Rubus spectabilis	FAC+	60
Rubus discolor	FACU	20
Rubus laciniatus	FACU	10
Rubus ursinus	FACU	10

Tree Stratum - % total cover:		50
Fraxinus latifolia	FACW	20
Populus balsamifera	FAC	15
Alnus rubra	FAC	15

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 8 of 11 = 73 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Bornstead silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Typic Haploxerults

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-10"	10 YR 3/2	mottles abundant, medium, 7.5 YR 5/8	Silty clay loam
	10-18"	7.5 YR 3/1	mottles abundant, coarse, 7.5 YR 4/6	Clay loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: 12"

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☑ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☑ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:
☐ Local soil survey data
☐ FAC-Neutral test

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/21/98	Investigator(s):	KC/PO
Project Name:	City of Oregon City		
WetlandCode:	NE-8	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:	B	Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	A	Q2:	B	Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	B	Q3:	B	Q3:		Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:	C	Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	A	Q6:	A	Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	C										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	C	Q1:	B
Q2:	A	Q2:	A	Q2:	C	Q2:	B
Q3:	C	Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	C	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has little enhancement potential.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-8	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Woody vegetation is dominant vegetation cover. Moderate degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	Between 50 and 75% of stream shaded by riparian vegetation. Portions of stream channel modified. Stream contains between 10 and 25% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. Salmon, trout, or sensitive species present sometime during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Moderate (approx. 60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Minor restrictions slow down waterflow out of the wetland. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-8	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has little enhancement potential.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is restricted and cannot be restored. Wetland's area is less than 0.5 acre. Less than 10% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/15/98

Wetland Mapping Code: NE-9

Investigator(s): JG/PO

Size (acres): 0.6

Location

Legal: T3S R2E S9

Other: Inskeep Environmental Center, CCC campus

Basin: Newell Creek

Soils

Mapped Series: 8B

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PFO, POW, PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs

Comments:

The wetland is on the grounds of the Inskeep Environmental Learning Center, formerly the site of Smuckers Berry Processing Plant. A creek runs through the site, which includes two excavated ponds. Tributary streams include one at the western end of the site, which originates as a spring on the site. The major water source is intermittently pumped water from a pump house on the northeastern end of the site. This water is from the heating/cooling system at the nearby Moss Campus of the Oregon City High School. The ultimate source of this water is a well on the Moss Campus grounds. The flow from the pump house into the site is highly variable, from no flow at times to very high flow. Vegetation is well developed and includes a mix of native and ornamental/non-native species. This site contains very high quality habitat for birds, waterfowl, small mammals, and herptiles, including the sensitive painted turtle.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	JG/PO
Project Name:	City of Oregon City		
WetlandCode:	NE-9	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:	A	Q1:	A	Q1:	B	Q1:	A
Q2:	A	Q2:		Q2:	B	Q2:	A	Q2:	A	Q2:	B
Q3:	B	Q3:		Q3:	A	Q3:	C	Q3:	B	Q3:	C
Q4:	B	Q4:		Q4:	A	Q4:	B	Q4:	A	Q4:	A
Q5:	A	Q5:		Q5:	C	Q5:	A	Q5:	B	Q5:	A
Q6:	A	Q6:		Q6:	B	Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	A	Q1:	B
Q2:	A	Q2:	A	Q2:	C	Q2:	B
Q3:	B	Q3:	B	Q3:	A	Q3:	A
Q4:	B	Q4:	A	Q4:	B	Q4:	A
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	A	Q6:	A	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides diverse wildlife habitat.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	The wetland's fish habitat function is intact.
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has educational uses.
Recreation:	The wetland provides recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-9	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides diverse wildlife habitat.	Two or more Cowardin wetland classes. Woody vegetation is dominant vegetation cover. Moderate degree of Cowardin class interspersion. Between 0.5 and 1 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	The wetland's fish habitat function is intact.	More than 75% of stream shaded by riparian vegetation. Portions of stream channel modified. Stream contains more than 25% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. Non-Salmonid, non-sensitive fish species present sometime during the year.
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Low (<60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Waterflow out of wetland is restricted or no outlet. Emergent veg. and ponding , or open water only is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	NE-9	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is restricted, but may be breached or new flow channel created. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has educational uses.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is a maintained public access point within 250 feet of the wetland's edge. Access is available for limited mobility.
Recreation	The wetland provides recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. Existing developed and maintained trails and viewing areas to guide user. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/21/98

Wetland Mapping Code: PP-1

Investigator(s): KC/PO

Size (acres): 1.5

Location

Legal: T2S R2E S29

Other: SW of intersection of Abernethy and Redland Roads

Basin: Abernethy Creek

Soils

Mapped Series: 76B, 84, 92F

Hydrology

Hydrologic Source: Surface water

Wetland Classification(s): PSS

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Salix sp.	*Crataegus douglasii*	*Rubus discolor*	*Phalaris arundinacea*
Corylus cornuta	*Salix sp.*	*Rubus laciniatus*	*Rorippa sphaerocarpa*
Acer macrophyllum		*Solanum dulcamara*	

Comments:

OFF-SITE DETERMINATION. The wetland is in a low-lying area between Abernethy and Redland Roads. There was no access because of a 6-foot-high cyclone fence covered with Himalayan blackberry (Rubus discolor). This is a fairly wide, shrubby grassland with abundant reed canarygrass (Phalaris arundinacea). The stream channel is narrow and probably contains water year-round. At the upstream site (PP-2), the stream is 2 to 3 feet across and approximately 10 inches deep. This site is bordered on the northwest by a major highway (OR 213) and on the southeast by Abernethy Road.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: PP-1 Plot: 37

T 2S R 2E S 29 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Low laying area in between

Project #: 7971165 Determined by: KC/PO Date: 7/21/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Comments: No access.

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:		Ind.	%Cover:
Herb Stratum - % total cover:		30	**Shrub/Sapling Stratum** - % total cover:		20
Phalaris arundinacea	FACW	90	*Crataegus douglasii*	FAC	40
Sylvestris dipsacus	FAC	10	*Salix sp.*	FAC	40
			Rosa sp.	NI	20
Woody Vine Stratum - % total cover:		45	**Tree Stratum** - % total cover:		5
Rubus discolor	FACU	50	*Salix sp.*	FAC	50
Rubus laciniatus	FACU	25	*Corylus cornuta*	FACU	30
Solanum dulcamara	FAC+	25	*Fraxinus latifolia*	FACW	10
			Acer macrophyllum	FACU	10

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 6 = 67 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Chehalis silt loam

Drainage Class: Deep, well drained soils on flood plains

Taxonomy: Fine-silty, mixed, mesic Cumulic Ultic Haploxerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Remarks: No access due to cyclone fence. Chehalis silt loam is listed as having hydric inclusions of Wapato silty clay loam.

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: N/A Depth to saturation: N/A

Primary Indicators:

☐ Inundated

☐ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☐ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Remarks: Ditch approximately 3-5 feet wide with associated flood plain.

Hydrology Criterion Met? No

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	DC/CM
Project Name:	City of Oregon City		
WetlandCode:	PP-1	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:	A	Q1:		Q1:	A	Q1:	A	Q1:	A
Q2:	C	Q2:	C	Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	B	Q3:	C	Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:	C	Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	A	Q6:	A	Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	A	Q1:	B
Q2:	A	Q2:	A	Q2:	C	Q2:	B
Q3:	C	Q3:	B	Q3:	C	Q3:	C
Q4:	B	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	B
Q5b:	A	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	PP-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. or wet meadow. Moderate degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	More than 75% of stream shaded by riparian vegetation. Physical character of stream channel extensively modified/piped. Stream contains less than 10% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. Salmon, trout, or sensitive species present sometime during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	PP-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is restricted and cannot be restored. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. At certain times, unpleasant odors are present at the primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	PP-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/21/98

Wetland Mapping Code: PP-2

Investigator(s): KC/PO

Size (acres): 1

Location

Legal: T2S R2E S29

Other: W of intersection of Clackamas River Dr. and Hwy. 213

Basin: Abernethy Creek

Soils

Mapped Series: 82, 92F

Hydrology

Hydrologic Source: Surface water

Wetland Classification(s): PSS

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Salix lasiandra	*Salix sitchensis*	*Rubus discolor*	*Phalaris arundinacea*
Alnus rubra		*Solanum dulcamara*	*Juncus effusus*
Populus balsamifera			

Comments:

The wetland is in a highly disturbed area at the base of a landfill. The fill appears to be as much as 20 feet deep. The fill area extends to within approximately 25 feet of the stream in some areas. The stream runs along the forest edge at the base of a very steep, forested slope.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: PP-2 Plot: 36

T 2S R 2E S 29 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Base of a landfill, E of intersection of Hwy 213 & Clackamas River Drive

Project #: 7971165 Determined by: KC/PO Date: 7/21/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? No

Explanation: major landfill to w/in 25' of stream.

Are Soils ☑ Vegetation ☑ Hydrology ☑ significantly disturbed? Yes

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		Ind. %Cover: 100
Phalaris arundinacea	FACW	70
Juncus effusus	FACW	20

Shrub/Sapling Stratum - % total cover:		Ind. %Cover: 20
Salix lasiandra	FACW	100

Woody Vine Stratum - % total cover:		10
Rubus discolor	FACU	100
Solanum dulcamara	FAC+	5

Tree Stratum - % total cover:		20
Salix lasiandra	FACW	60
Alnus rubra	FAC	25
Populus balsamifera	FAC	15

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 6 = 67 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Urban land
Drainage Class: N/A
Taxonomy: N/A

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"	5 Y 5/2	mottles few, small, (5 YR 5/8)	Sandy silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Remarks: soil is all urban fill

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☑ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	DC/CM
Project Name:	City of Oregon City		
WetlandCode:	PP-2	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:	A	Q1:		Q1:	A	Q1:	A	Q1:	A
Q2:	C	Q2:	B	Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:	C	Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	B	Q4:	A	Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	B	Q5:	A
Q6:	A	Q6:	A	Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	A	Q1:	B
Q2:	A	Q2:	B	Q2:	C	Q2:	B
Q3:	C	Q3:	B	Q3:	C	Q3:	C
Q4:	B	Q4:	B	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	B
Q5b:	A	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is intact.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	PP-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Between 0.5 and 1 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	The wetland's fish habitat function is intact.	More than 75% of stream shaded by riparian vegetation. Portions of stream channel modified. Stream contains less than 10% of instream structures. Upstream not listed as water quality limited. Salmon, trout, or sensitive species present sometime during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Emergent veg. and ponding , or open water only is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	PP-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is restricted and cannot be restored. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. One to two visible safety hazards exist at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, but observation of other features can be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Between 25 and 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. At certain times, unpleasant odors are present at the primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 2/12/97, 6/25/97 **Wetland Mapping Code:** PP-3

Investigator(s): JF/CM, DC/JF **Size (acres):** 0.8

Location

Legal: T2S R2E S28,29

Other: Between Apperson Blvd. and Hunter Ave.

Basin: Park Place

Soils

Mapped Series: 3, 37C, 91B

Hydrology

Hydrologic Source: Sheet flow

Wetland Classification(s): PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
		Solanum dulcamara	*Holcus lanatus*
			Rumex crispus
			Veronica americana
			Epilobium watsonii
			Dipsacus sylvestris
			Phalaris arundinacea
			Equisetum arvense
			Sonchus arvensis

Comments:

This drainage ditch is a continuation of a drainage ditch located further upslope. It is very channelized and even piped beneath several residential properties. The vegetation directly along the sides of the ditch varies from ornamental to native species. It appears that many homeowners either mow the ditch or spray it with herbicide. Some portions are professionally landscaped. The majority of this ditch was viewed from roadways because access was denied by homeowners.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: PP-3 Plot: 7

T 2S R 2E S 29 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Swale located in backyards of several homes between Apperson Blvd and Harley Ave.

Project #: 7971165 Determined by: JF/CM Date: 6/12/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		**100**
Phalaris arundinacea	FACW	50
Equisetum arvense	FAC	20
Sonchus arvensis	FACU	15
Dipsacus sylvestris	FAC	10
Woody Vine Stratum - % total cover:		**10**
Solanum dulcamara	FAC+	5

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		**0**
Tree Stratum - % total cover:		**0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 2 = 100 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Woodburn silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Aquultic Argixerolls

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"+	2.5 Y 5/2		Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☑ Other
Explain: Within floodplain of small drainage.
☐ Local soil survey data
☐ FAC-Neutral test

Remarks: Plot located near narrow (1-2 ft. wide) flowing stream.

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: PP-3 Plot: 8

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Along stream midway between Hiram and Hunter Avenues.

Project #: 7971165 Determined by: DC/JF Date: 6/25/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		**90**
Holcus lanatus	FAC	30
Dipsacus sylvestris	FAC	20
Rumex crispus	FAC+	20
Veronica americana	OBL	20
Epilobium watsonii	FACW	10
Woody Vine Stratum - % total cover:		**10**
Rubus discolor	FACU	100

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		**0**
Tree Stratum - % total cover:		**0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 4 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Amity silt loam

Drainage Class: Somewhat poorly drained.

Taxonomy: Fine-silty, mixed, mesic Argiaquic Xeric Argialboll

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"+	10 YR 3/1		Sandy loam, rock, gravel

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 8" Depth to saturation: Surface

Primary Indicators:

☐ Inundated

☑ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☑ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: PP-3 Plot: 9

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Along stream midway between Hiram and Hunter Avenues.

Project #: 7971165 Determined by: DC/JF Date: 6/25/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		**40**
Poa pratensis	FAC	40
Vicia sativa	UPL	30
Dactylis glomerata	FACU	30
Woody Vine Stratum - % total cover:		**20**
Rubus discolor	FACU	100

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		**40**
Oemleria cerasiformis	FACU	60
Rosa pisocarpa	FAC	40
Tree Stratum - % total cover:		**0**

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 6 = 33 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Amity silt loam

Drainage Class: Somewhat poorly drained.

Taxonomy: Fine-silty, mixed, mesic Argiaquic Xeric Argialboll

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"+	10 YR 3/3		Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:

☐ Inundated

☐ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☐ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Hydrology Criterion Met? No

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	DC/CM
Project Name:	City of Oregon City		
WetlandCode:	PP-3	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	C	Q1:	B	Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	C	Q2:	C	Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:	C	Q3:		Q3:	C	Q3:	C	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:	C	Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	A	Q6:	C	Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	A	Q1:	C
Q2:	A	Q2:	A	Q2:	C	Q2:	C
Q3:	C	Q3:	B	Q3:	C	Q3:	C
Q4:	C	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	A	Q5:	B	Q5:	B
Q5b:	C	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has little enhancement potential.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	PP-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with 5 or fewer plant species. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	Between 50 and 75% of stream shaded by riparian vegetation. Physical character of stream channel extensively modified/piped. Stream contains less than 10% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. No fish species present during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. Low (<60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is less than 0.5 acre. Minor restrictions slow down waterflow out of the wetland. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	PP-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has little enhancement potential.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is restricted and cannot be restored. Wetland's area is less than 0.5 acre. Less than 10% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. At certain times, unpleasant odors are present at the primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 7/16/98

Wetland Mapping Code: PP-4

Investigator(s): CM, DG

Size (acres): 0.4

Location

Legal: T2S R2E S28

Other: Between Hunter and Swan Avenues, N of Holcomb Blvd.

Basin: Park Place

Soils

Mapped Series: 13C, 76B

Hydrology

Hydrologic Source: Sheet flow

Wetland Classification(s): PEM

Dominant Vegetation

Trees	Shrubs	Vines	Herbs

Comments:

This water resource feature consists of a very channelized north-south oriented ditch that is separated by culverts in at least five locations The ditch flows toward the south. The banks of the ditch are very steep, with very little hydrophytic vegetation growing within the channel of the ditch.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: PP-4 Plot: 38

T 2S R 2E S 28 City: Oregon City County: Clackamas State: OR

Plot Location; Topography N. side of stream ~ 12' from channel; toe of slope.

Project #: 7971165 Determined by: CM/DG Date: 7/16/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		60
Festuca arundinacea	FAC-	75
Plantago lanceolata	FAC	5
Holcus lanatus	FAC	5
Chrysanthemum leucanthemum	UPL	5
Trifolium arvense	UPL	5
Daucus carota	UPL	3
Hypochaeris radicata	FACU	2
Woody Vine Stratum - % total cover:		0

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		0
Tree Stratum - % total cover:		0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 0 of 1 = 0 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Cascade silt loam

Drainage Class: Somewhat poorly drained

Taxonomy: Fine-silty, mixed, mesic Typic Fragiumbrept

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18	10 YR 3/3		Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:

☐ Inundated

☐ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☐ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Remarks: Dry.

Hydrology Criterion Met? No

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/16/98	Investigator(s):	CM/DG
Project Name:	City of Oregon City LWI		
WetlandCode:	PP-4	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:	C	Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	C	Q2:	C	Q2:		Q2:	C	Q2:	C	Q2:	B
Q3:	C	Q3:	B	Q3:		Q3:	C	Q3:	B	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	B	Q4:	C	Q4:	A
Q5:	B	Q5:	C	Q5:		Q5:	A	Q5:	C	Q5:	A
Q6:	B	Q6:	C	Q6:		Q6:	C	Q6:	A	Q6:	B
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	B	Q1:	C
Q2:	A	Q2:	A	Q2:	C	Q2:	C
Q3:	A	Q3:	B	Q3:	C	Q3:	B
Q4:	B	Q4:	B	Q4:	B	Q4:	B
Q5a:		Q5:	B	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is impacted or degraded.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has educational uses.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	PP-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Emergent veg. or wet meadow. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland not connected to other wetlands, but within 3 mile radius of other wetlands. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	Less than 50% of stream shaded by riparian vegetation. Physical character of stream channel extensively modified/piped. Stream contains between 10 and 25% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. No fish species present during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Surface flow (including streams and ditches) is wetland's primary source of water. No evidence of flooding or ponding during the growing season. Low (<60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is impacted or degraded.	No part of wetland located within 100-year floodplain or enclosed basin. No evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Waterflow out of wetland is unrestricted. Emergent veg. or wet meadow is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	PP-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Emergent veg. only or wet meadow is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is not restricted, but if blocked, obstruction can be removed easily. Wetland's area is between 0.5 and 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has educational uses.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, but observation of other features can be made. There is an unmaintained access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is an unmaintained public access point within 250 feet of the wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors, which can be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	PP-4	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		at primary viewing locations.

CITY OF OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 6/4/97

Wetland Mapping Code: SE-1

Investigator(s): JF/DC

Size (acres): 1.1

Location

Legal: T3S R1E S1

Other: Backyards of several homes between Cook & Lafayette

Basin: South End

Soils

Mapped Series: 30C

Hydrology

Hydrologic Source: Sheet flow

Wetland Classification(s): PFO

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia	*Crataegus douglasii*		*Carex obnupta*
	Spiraea douglasii		

Comments:

This wetland is surrounded by residential development. Grass clippings, children's toys, and some garbage are present. The wetland has no apparent outlet, but is heavily forested and has good vertical structure. The sample plot is next to a pond.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: SE-1 Plot: 32

T 3S R 1E S 1 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Backyards of several homes between Cook St. and Lafayette Ave. Plot next to pond.

Project #: 7971165 Determined by: JF/DC Date: 6/4/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		35
Carex obnupta	OBL	100
Woody Vine Stratum - % total cover:		5
Rubus ursinus	FACU	10

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		25
Crataegus douglasii	FAC	65
Spiraea douglasii	FACW	25
Tree Stratum - % total cover:		40
Fraxinus latifolia	FACW	100

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 4 of 4 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Delena silt loam

Drainage Class: Poor

Taxonomy: Fine-silty, mixed, mesic Humic Fragiaquepts

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"+	10 YR 3/2	mottles many, large, 7.5 YR 4/6	Silty clay

☐ Histosol ☑ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking

☐ Histic epipedon ☑ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☑ On hydric soils list

Remarks: Very strong hydric soil indicatiors.

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: Surface Depth to saturation: Surface

Primary Indicators:

☐ Inundated

☑ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☑ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Remarks: Plot located next to a pond

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	KC/ES
Project Name:	City of Oregon City		
WetlandCode:	SE-1	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:		Q1:		Q1:	B	Q1:	A	Q1:	A
Q2:	A	Q2:		Q2:		Q2:	B	Q2:	B	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	B	Q4:	A	Q4:	A
Q5:	B	Q5:		Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	B	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	A	Q1:	C	Q1:	C
Q2:	C	Q2:	A	Q2:	C	Q2:	A
Q3:		Q3:	B	Q3:	C	Q3:	B
Q4:	B	Q4:	A	Q4:	B	Q4:	A
Q5a:		Q5:	B	Q5:	B	Q5:	A
Q5b:	B	Q6:	A	Q6:	C	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is impacted or degraded.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has educational uses.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	SE-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland not connected to another body of water, but water within 1 mile. Wetland not connected to other wetlands, but within 3 mile radius of other wetlands. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is impacted or degraded.	Precipitation or sheet flow is wetland's primary source of water. Unable to determine evidence of flooding or ponding during the growing season (or unapplicable). High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	All or part of wetland located within 100-year floodplain or enclosed basin. Unable to determine evidence of flooding or ponding during the growing season (or not applicable). Area is between 0.5 and 5 acres. Waterflow out of wetland is restricted or no outlet. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential		

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	SE-1	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is precipitation or sheet flow. Wetland's area is between 0.5 and 5 acres. Between 10 and 40 % of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has educational uses.	Wetland site is open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is existing physical public access to other features or it can be created easily and other habitats can be observed from this site. There is an unmaintained access point within 250 feet of the wetland's edge. Access is available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable).
Aesthetic Quality	The wetland is considered to be moderately pleasing.	One Cowardin class is visible from primary viewing area(s). More than 50% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors, which can be removed easily. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

CITY OF OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 6/5/97 **Wetland Mapping Code:** SE-2

Investigator(s): DC/JF **Size (acres):** 5.8

Location

Legal: T3S R1E S1, 12

Other: SW of intersection of South End and Partlow Rds.

Basin: South End

Soils

Mapped Series: 8B, 30C, 64B

Hydrology

Hydrologic Source: Mainly groundwater; sheet flow

Wetland Classification(s): PFO, PSS, PEM, POW

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Quercus garryana	*Spiraea douglasii*		*Holcus lanatus*
Fraxinus latifolia	*Rosa pisocarpa*		*Ranunculus repens*
			Lotus corniculatus

Comments:

This wetland is composed of three sub-units. A small drainage flows from the edge of the UGB through a forest, then in the large yards of residences. Most of the drainage flows in an altered natural channel. However, two small, excavated ponds capture some of the water, and the southeastern portion is a straight excavated channel. Much of the drainage and surrounding saturated areas is forested (50%) and scrub/shrub (25%), with portions that are emergent (25%). Two side drainages/wetlands, SE-2b and SE-2c, are scrub/shrub and appear to be fed by groundwater.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: SE-2 Plot: 30

T 3S R 1E S 1 City: Oregon City County: Clackamas State: OR

Plot Location; Topography South of drainage south of Rose Street.

Project #: 7971165 Determined by: DC/JF Date: 6/5/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		1
Polystichum munitum	FACU	1
Pteridium aquilinum	FACU	1
Woody Vine Stratum - % total cover:		0

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		100
Amelanchier alnifolia	FACU	30
Crataegus douglasii	FAC	25
Holodiscus discolor	UPL	25
Rhamnus purshiana	FAC-	25
Tree Stratum - % total cover:		25
Pseudotsuga menziesii	FACU	100

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 1 of 5 = 20 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Bornstedt silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Typic Haploxerults

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-5"	10 YR 3/2		Silt loam
	5-18"+	7.5 YR 3/3		Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:
☐ Local soil survey data
☐ FAC-Neutral test

Hydrology Criterion Met? No

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: SE-2 Plot: 31

T 3S R 1E S 1 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Drainage south of Rose Street.

Project #: 7971165 Determined by: DC/JF Date: 6/5/97

DETERMINATION: IS THIS PLOT IN A WETLAND? Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover: 90	Ind.	%Cover:
Holcus lanatus	FAC	25
Ranunculus repens	FACW	20
Lotus corniculatus	FAC	20
Carex leporina	FACW	15
Juncus bufonius	FACW	10
Veronica americana	OBL	5

Shrub/Sapling Stratum - % total cover: 10	Ind.	%Cover:
Spiraea douglasii	FACW	70
Rosa pisocarpa	FAC	30

Woody Vine Stratum - % total cover: 0

Tree Stratum - % total cover: 0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 5 of 5 = 100 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Bornstedt silt loam
Drainage Class: Moderately well drained
Taxonomy: Fine-silty, mixed, mesic Typic Haploxerults

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-10"	10 YR 3/2		Silt loam
	10-	7.5 YR 3/1	mottles 10 YR 4/4	Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☑ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 3" Depth to saturation: Surface

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	7/15/98	Investigator(s):	KC/ES
Project Name:	City of Oregon City		
WetlandCode:	SE-2	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	A	Q1:		Q1:		Q1:	B	Q1:	B	Q1:	A
Q2:	A	Q2:		Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:		Q3:		Q3:	A	Q3:	A	Q3:	C
Q4:	C	Q4:		Q4:		Q4:	A	Q4:	A	Q4:	A
Q5:	A	Q5:		Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	A	Q6:		Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	A										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	C	Q1:	A	Q1:	B
Q2:	C	Q2:	A	Q2:	C	Q2:	C
Q3:		Q3:	B	Q3:	C	Q3:	A
Q4:	A	Q4:	B	Q4:	B	Q4:	A
Q5a:		Q5:	A	Q5:	B	Q5:	A
Q5b:	A	Q6:	B	Q6:	B	Q6:	A
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	N/A
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland site is not appropriate for educational use.
Recreation:	The wetland has the potential to provide recreational opportunities.
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	SE-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	Two or more Cowardin wetland classes. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. More than 40% of wetland edge bordered by veg. buffer 25 or more feet wide.
Fish Habitat - Streams	N/A	
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Precipitation or sheet flow is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. More than 5 acres of wetland area. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is more than 5 acres. Waterflow out of wetland is restricted or no outlet. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	SE-2	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		habitat, water quality and hydrologic control. Wetland's primary source of water is precipitation or sheet flow. Wetland's area is more than 5 acres. More than 40% of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland site is not appropriate for educational use.	Wetland site is not open to the public for direct access or observation. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, but observation of other features can be made. There is a maintained public access point within 250 feet of the wetland's edge. Access is not available for limited mobility.
Recreation	The wetland has the potential to provide recreational opportunities.	There is a maintained public access point within 250 feet of wetland's edge. Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has no visual detractors. Visual character with surrounding area is open or naturally landscaped. Natural, pleasant odors are present at primary viewing location. Some traffic and other similar sounds and natural sounds are audible at primary viewing locations.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 07/15/98

Wetland Mapping Code: SE-3

Investigator(s): DC/JF/KC/ES

Size (acres): 4.7

Location

Legal: T3S R1E S12

Other: S of South End Rd., N of Parrish Rd.

Basin: South End

Soils

Mapped Series: 46B, 46C, 64B

Hydrology

Hydrologic Source: Surface flow

Wetland Classification(s): PEM, PFO, RSB

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
Fraxinus latifolia	*Fraxinus latifolia*		*Festuca arundinacea*
			Holcus lanatus
			Potentilla palustris
			Myosotis discolor
			Agrostis alba
			Lotus corniculatus
			Ranunculus repens
			Camassia sp.

Comments:

The site consists of a series of interconnected ditches, wet meadows, and forested wetland. Drainage ditch SE-3a connects by a culvert under South End Rd. to SE-3b. This shallow drainage flows behind a residence southwest of Salmonberry Dr. The drainage here is bordered by a low-gradient wet meadow (SE-3c) that appears likely to flood during high water periods. The drainage has been channelized and manipulated through the residential property using concrete and rock. From the wet meadow, the drainage flows southwest, then makes a 90 degree turn, flowing southeast along another property line. This drainage is linked to another wet meadow (SE-3f, oriented in a northwest to southeast direction) that widens away from the channel to the south. The wet meadow transitions into an Oregon ash (Fraxinus latifolia) wooded wetland (oriented north to south). Another drainage (SE-3 d,e) connects to the woodland from the north. The woodland changes to wet meadow, and back to woodland again at its southern extent. The drainage channel becomes less manipulated and more natural, flowing in the southern section of the wetland complex.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: SE-3 Plot: 28

T 3S R 1E S 12 City: Oregon City County: Clackamas State: OR

Plot Location; Topography L B Creek N. of Parrish. Between N/S tributary and L B Creek.

Project #: 7971165 Determined by: DC/JF Date: 6/5/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Comments: Hydrology criterion is met, but vegetation and soil characteristics indicate the area is upland.

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover: 80**	**Shrub/Sapling Stratum** - % total cover:		**Ind. %Cover: 20**
Camassia quamash	FACW	45	*Crataegus monogyna*	FACU	70
Smilacina stellata	FAC-	45	*Symphoricarpos albus*	FACU	20
Tellima grandiflora	UPL	10	*Oemleria cerasiformis*	FACU	10
Woody Vine Stratum - % total cover:		**0**	**Tree Stratum** - % total cover:		**100**
			Fraxinus latifolia	FACW	100

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 5 = 40 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Jory stony silt loam
Drainage Class: Well drained
Taxonomy: Clayey, mixed, mesic Xeric Haplohumults

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"	10 YR 2/2		Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☐ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: 10" Depth to saturation: 6"

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):
☐ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Remarks: Shallow water table.

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: SE-3 Plot: 29

T 3S R 1E S 12 City: Oregon City County: Clackamas State: OR

Plot Location; Topography S of intersection of S End Rd. and Forest Ridge Ln. in wet field.

Project #: 7971165 Determined by: DC/JF Date: 6/5/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Comments: Soil is very marginally hydric. Perhaps it has been aerated through use as pasture or other agricultural production.

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

Herb Stratum - % total cover:		**Ind. %Cover:** 100
Agrostis alba	FAC	40
Lotus corniculatus	FAC	40
Ranunculus repens	FACW	10
Camassia quamash	FACW	3
Rumex crispus	FAC+	2

Shrub/Sapling Stratum - % total cover: 0 **Ind. %Cover:**

Woody Vine Stratum - % total cover: 0 **Tree Stratum** - % total cover: 0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 2 = 100 % (50/20 Rule)

Remarks: Young Oregon ash thriving nearby.

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Jory stony silt loam

Drainage Class: Well drained

Taxonomy: Clayey, mixed, mesic Xeric Haplohumults

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"	10 YR 3/2	mottles very faint	Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking

☐ Histic epipedon ☑ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Remarks: Soil not strongly hydric. Perhaps due to aeration from use as a pasture.

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation 0.5-1" Depth to water table: Surface Depth to saturation: Surface

Primary Indicators:

☑ Inundated

☑ Saturated in upper 12"

☐ Water marks

☐ Drift lines

☐ Sediment deposits

☐ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres ☐ Local soil survey data

☐ Water-stained leaves ☐ FAC-Neutral test

☐ Recorded data (aerials, groundwater data)

Explain:

☐ Other

Explain:

Remarks: Plot inundated with slight flow noted.

Hydrology Criterion Met? Yes

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: SE-3 Plot: 33

T 3S R 1E S 12 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Open pasture along Parrish Rd. in shallow swale that enters culvert at road.

Project #: 7971165 Determined by: DC/JF Date: 6/5/97

DETERMINATION: IS THIS PLOT IN A WETLAND?: No

Comments: Although situated in a swale, the plot is very dry with no wetland indicating features.

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

VEGETATION Dominant Plant Species

	Ind.	%Cover:
Herb Stratum - % total cover:		100
Festuca arundinacea	FAC-	65
Convolvulus sp.	UPL	35
Woody Vine Stratum - % total cover:		0

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		0
Tree Stratum - % total cover:		0

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 0 of 2 = 0 % (50/20 Rule)

Vegetation Criterion Met? No

SOILS Mapped Unit Name: Jory stony silt loam

Drainage Class: Well drained

Taxonomy: Clayey, mixed, mesic Xeric Haplohumults

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-18"	7.5 YR 3/2		Silt loam

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking

☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan

☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☐ On hydric soils list

Remarks: Soil not strongly hydric. Perhaps dut to aeration from use as a pasture.

Soil Criterion Met? No

HYDROLOGY

Depth of inundation N/A Depth to water table: >18" Depth to saturation: >18"

Primary Indicators:

☐ Inundated
☐ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☐ Sediment deposits
☐ Drainage patterns

Secondary Indicators (2 or more required):

☐ Oxidized rhizospheres
☐ Water-stained leaves
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:
☐ Local soil survey data
☐ FAC-Neutral test

Hydrology Criterion Met? No

WETLAND DETERMINATION DATA SHEET - 1987 MANUAL

Client/Applicant: City of Oregon City Site: SE-3 Plot: 49

T 3S R 1E S 12 City: Oregon City County: Clackamas State: OR

Plot Location; Topography Channelized ditch E of South End Rd./S Rose Rd.

Project #: 7971165 Determined by: KC/ES Date: 7/15/98

DETERMINATION: IS THIS PLOT IN A WETLAND?: Yes

Do Normal Circumstances exist on the site? Yes

Are Soils ☐ Vegetation ☐ Hydrology ☐ significantly disturbed? No

Explanation: Conditions are well established rock wall constructed on south side of drainage.

VEGETATION Dominant Plant Species

		Ind.	%Cover:
Herb Stratum - % total cover:			20
Festuca arundinacea		FAC-	40
Holcus lanatus		FAC	30
Poa palustris		FAC	20
Myosotis discolor		FACW	10
Woody Vine Stratum - % total cover:			0

	Ind.	%Cover:
Shrub/Sapling Stratum - % total cover:		
Tree Stratum - % total cover:		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 2 of 3 = 67 % (50/20 Rule)

Vegetation Criterion Met? Yes

SOILS Mapped Unit Name: Jory stony silt loam
Drainage Class: Well drained
Taxonomy: clayey, mixed, mesic Xeric Haplohumults

Horizon	Depth	Matrix Color	Redox Abundance, Size, Color	Texture, Structure, Other
	0-8"	10YR 3/2		Silt loam
	8-18"	10YR 4/2	mottles abundant, faint, 7.5YR 4/4	Silty clay loam

☐ Histosol ☐ Prob. Aquic moisture regime ☑ Redox features ☐ Organic streaking
☐ Histic epipedon ☐ Reducing conditions ☐ Concretions ☐ Organic pan
☐ Sulfidic odor ☐ Gleyed ☐ Highly organic surface layer ☑ On hydric soils list

Soil Criterion Met? Yes

HYDROLOGY

Depth of inundation N/A Depth to water table: 18" Depth to saturation: 12"

Primary Indicators:
☐ Inundated
☑ Saturated in upper 12"
☐ Water marks
☐ Drift lines
☑ Sediment deposits
☑ Drainage patterns

Secondary Indicators (2 or more required):
☑ Oxidized rhizospheres ☐ Local soil survey data
☐ Water-stained leaves ☐ FAC-Neutral test
☐ Recorded data (aerials, groundwater data)
Explain:
☐ Other
Explain:

Hydrology Criterion Met? Yes

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Date(s):	07/15/98	Investigator(s):	KC/ES
Project Name:	City of Oregon City		
WetlandCode:	SE-3	ProjectNumber:	7971165

Wildlife Habitat		Fish Habitat Streams		Fish Habitat Lakes/Ponds		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q1:	B	Q1:	B	Q1:		Q1:	A	Q1:	B	Q1:	A
Q2:	A	Q2:	C	Q2:		Q2:	A	Q2:	A	Q2:	B
Q3:	C	Q3:	C	Q3:		Q3:	A	Q3:	B	Q3:	C
Q4:	C	Q4:	A	Q4:		Q4:	B	Q4:	B	Q4:	A
Q5:	A	Q5:	C	Q5:		Q5:	A	Q5:	A	Q5:	A
Q6:	A	Q6:	C	Q6:		Q6:	C	Q6:	A	Q6:	A
Q7:	A							Q7:	A		
Q8:	C										
Q9a:											
Q9b:	B										

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q1:	B	Q1:	B	Q1:	C	Q1:	B
Q2:	A	Q2:	A	Q2:	C	Q2:	C
Q3:	C	Q3:	B	Q3:	C	Q3:	C
Q4:	B	Q4:	C	Q4:	B	Q4:	B
Q5a:		Q5:	C	Q5:	B	Q5:	A
Q5b:	B	Q6:	B	Q6:	B	Q6:	B
Q6:	B						

Wildlife Habitat:	The wetland provides habitat for some wildlife species.
Fish Habitat - Streams:	The wetland's fish habitat function is impacted or degraded.
Fish Habitat - Lakes/Ponds:	N/A
Water Quality:	The wetland's water quality function is intact.
Hydrologic Control:	The wetland's hydrologic control function is intact.
Sensitivity to Impact:	The wetland is potentially sensitive to future impacts.
Enhancement Potential:	The wetland has moderate potential for enhancement.
Education:	The wetland has potential for educational use.
Recreation:	The wetland is not appropriate for or does not provide recreational opport
Aesthetic Quality:	The wetland is considered to be moderately pleasing.

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	SE-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	The wetland provides habitat for some wildlife species.	One Cowardin wetland class with more than 5 plant species. Woody vegetation is dominant vegetation cover. Low degree of Cowardin class interspersion. Less than 0.5 acre of unvegetated open water present. Wetland connected to another body of water by surface water. Wetland connected to other wetlands within a 3 mile radius. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge.
Fish Habitat - Streams	The wetland's fish habitat function is impacted or degraded.	Between 50 and 75% of stream shaded by riparian vegetation. Physical character of stream channel extensively modified/piped. Stream contains less than 10% of instream structures. Upstream not listed as water quality limited. Residential/Industrial land use within 500 feet of wetland edge. No fish species present during the year.
Fish Habitat - Lakes/Ponds	N/A	
Water Quality	The wetland's water quality function is intact.	Surface flow (including streams and ditches) is wetland's primary source of water. Evidence of flooding or ponding during part of the growing season. High (>60%) degree of wetland vegetation cover. Between 0.5 and 5 acres of wetland connected to other wetlands within a 3 mile radius. Residential/Industrial land use within 500 feet of wetland edge. Upstream not listed as water quality limited in watershed or adjacent to the wetland.
Hydrologic Control	The wetland's hydrologic control function is intact.	No part of wetland located within 100-year floodplain or enclosed basin. Evidence of flooding or ponding during the growing season. Area is between 0.5 and 5 acres. Minor restrictions slow down waterflow out of the wetland. Woody vegetation is dominant cover type. Residential/Industrial land use within 500 ft of wetland on downstream or down-slope edge of wetland. Urban or Urbanizing land use in watershed upstream from area.
Sensitivity to Impact	The wetland is potentially sensitive to future impacts.	Stream flow or bank has been modified by human activities within 1 mile above wetland. Water is not being taken out of streams through active diking, drainage, or irrigation districts upstream. Upstream not listed as water quality limited in watershed upstream of the or adjacent to the wetland. Residential/industrial (developed) land use within 500 feet of wetland's edge. Dominant

OREGON FRESHWATER WETLAND ASSESSMENT METHODOLGY

Function and Condition Summary Sheet for the Oregon Method

WetlandCode:	SE-3	ProjectNumber:	7971165

Function	Evaluation Descriptor	Rationale
		Residential/Industrial (developed) land use within 500 feet of wetland's edge. Woody vegetation is the dominant cover.
Enhancement Potential	The wetland has moderate potential for enhancement.	Wetland has lost one or more functions or one or more functions is not present in assessment results for wildlife habitat, fish habitat, water quality and hydrologic control. Wetland's primary source of water is surface flow, including streams and ditches. Water flow into wetland is restricted and cannot be restored. Wetland's area is between 0.5 and 5 acres. Between 10 and 40 % of wetland's edge is bordered by a vegetative buffer 25 or more feet wide. Wetland is potentially sensitive to future impacts.
Education	The wetland has potential for educational use.	Wetland site is open to the public for direct access or observation, but allowed only with permission. There are no visible hazards to the public at the wetland site. Provides wildlife habitat for some species, or fish habitat is impacted or degraded. There is no existing physical public access to other features, and observation of other features cannot be made. There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Access is not available for limited mobility.
Recreation	The wetland is not appropriate for or does not provide recreational opportunities.	There is not an existing access point within 250 feet of the wetland's edge (if existing-hazardous). Wetland not accessible by boat-no boat launch within 1 mile/ cannot develop. No existing trails and viewing areas to guide user or if created, would disrupt wildlife or plant habitat. Wetland provides habitat for some species. Fishing is not allowed at wetland or adjacent water body (or not applicable). Hunting is not allowed at the wetland.
Aesthetic Quality	The wetland is considered to be moderately pleasing.	Two Cowardin classes are visible from primary viewing area(s). Less than 25% of wetland is visible from viewing area(s). General appearance of wetland has visual detractors which cannot be removed easily. Visual character with surrounding area is landscaped or manipulated by people. Natural, pleasant odors are present at primary viewing location. Continuous traffic and other intrusive noise and natural sounds are audible at primary viewing location.

OREGON CITY LOCAL WETLANDS INVENTORY

- Wetland Summary Sheet -

Date(s) of Field Verification: 9/16/98 **Wetland Mapping Code:** TH-1

Investigator(s): DC **Size (acres):** 0.3

Location

Legal: T3S R2E S15

Other: Oregon City Golf Club

Basin: Thimble

Soils

Mapped Series: 24B, 45B

Hydrology

Hydrologic Source: Sheet flow

Wetland Classification(s): POW

Dominant Vegetation

Trees	Shrubs	Vines	Herbs
			Juncus effusus
			Typha latifolia

Comments:

These excavated water hazards are steep-banked, surrounded by mowed grass, and mostly unvegetated, but have patches of hydrophytic vegetation. It is unclear if the water features have an outlet. Although they are mapped in the Thimble surface water management basin, they may drain to Gaufield Creek.

Wetland Classification Codes:

PFO = palustrine forested	PSS = palustrine scrub-shrub	RSB = riverine streambed (intermittent)
PEM = palustrine emergent	POW = palustrine open water	RUB = riverine unconsolidated bottom



Appendix B

Riparian Data and Summary Sheets

OREGON CITY LOCAL WETLANDS INVENTORY

- Stream Summary Sheet -

Date(s) of Field Verification: 9/23/98

Mapping Code: AB-1

Investigator(s): DC

Size (acres): 7.7

Location

Legal: T2S R2E S28, 29, 30, 32, 33

Other: Abernethy Creek from Main St. extension east to Holly Lane

Basin: Abernethy

Comments:

Abernethy Creek is a perennial stream with steep to vertical banks. It is unvegetated, and the streambed varies from cobbles to mud. The creek is approximately 20 to 30 feet wide and does not flow through culverts for this entire reach. The stream likely has been channelized and deepened in places, especially in the lower (western) portion. The creek enters a long culvert at the western end and flows into the Willamette west of the Interstate 205 interchange. Coho and steelhead salmonids are known to be present in the stream. Further information about the stream and its riparian area can be found in the riparian assessment results.

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABR-1

Riparian Width Determination

Date: 9/16/98 Investigators: DC

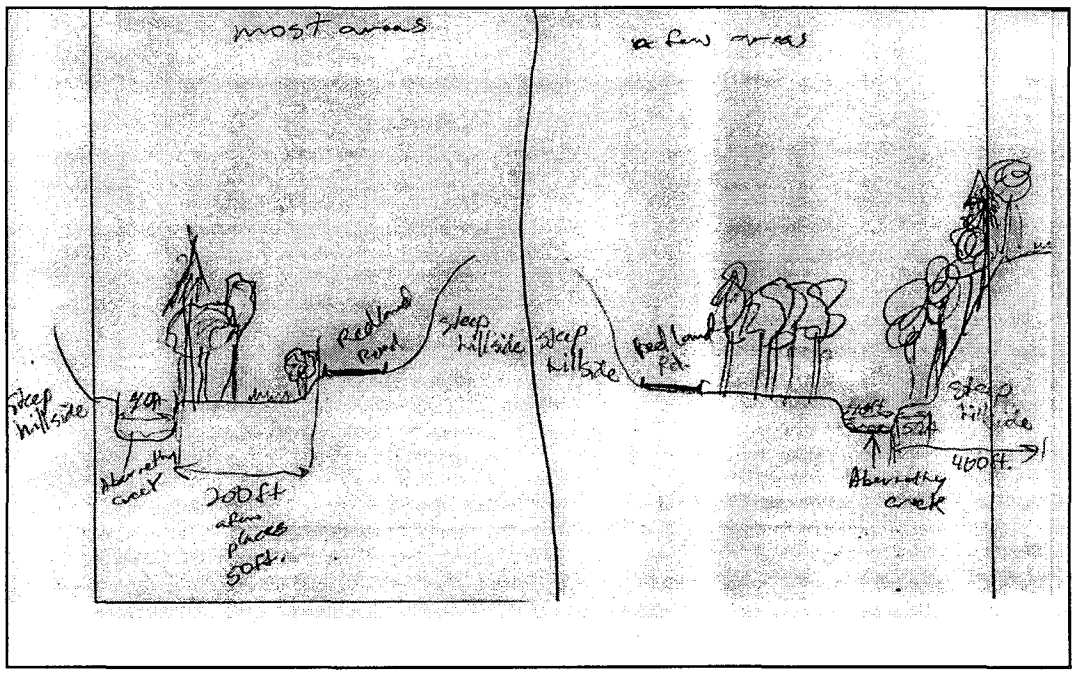
Dominant tree species: Fraxinus latifolia/Alnus rubra

Potential tree height (PTH)/Width of Riparian Area: 75/75
(Width measured horizontally from edge of water resource)

PTH determined by: ☑ On-site vegetation ☐ Reference site Code:

Comments: The riparian area has scattered houses (3) and varies from flat floodplain to steep hillsides. Vegetation is mostly native shrubs and trees with a few fields of mixed grasses and yards. Portions of this reach are outside the study area

Typical Cross Section:



Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABR-1

Riparian Characterization Form — Part 1

General Information

Date: 9/16/98

On-site ☑ Office ☐ Reach Length: 5,280

Investigators: DC Hydrologic Basin: Abernethy Creek

Water Resource Information

Water Resource:			
	Stream/River ☑	Width:	30
	Lake/Pond ☐	Width:	0
	Wetland ☐	Width:	0

LWI Wetland Code: AB-1

Water present year-round: Yes

Are salmonids present in the adjacent water resource: Yes

Is the water resource listed for temperature on DEQ's 303(d) list: No

Within FEMA-mapped 100-year floodplain: Yes

Mapped soil series: 16, 17, 84, 91C, 92F

Adjacent Land Uses?

Agriculture ☐	Residential ☑	Undeveloped ☑
Commercial ☐	Roads ☑	Forestry ☐

Woody Vegetation	Herbaceous Vegetation
Pseudotsuga menziesii	Rubus discolor
Alnus rubra	
Fraxinus latifolia	
Populus balsamifera	
Acer macrophyllum	
Salix lasiandra	
Salix scouleriana	

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABR-1

Riparian Characterization Form — Part 2

Average slope in the riparian area: (Question 1)

☐ <10:1 (10%) ☑ Between 10:1 (10%) and 5:1 (20%) ☐ >5:1 (20%)

Extent of impervious surface within the riparian area: (Question 4)

☑ <10% ☐ 10% to 25% ☐ >25%

☐ **The reach is constricted by man-made features.**

☑ **The orientation allows for shading of the water resource at midday in summer.**

Dominant vegetation layer within the riparian area:

☑ Woody vegetation ☐ Herbaceous vegetation ☐ Bare ground

☑ **Woody vegetation hangs over the edge of the water.**

☑ **Large woody debris in riparian area.**

Percent of water resource bordered by vegetated riparian area at least 30 feet wide:

☑ >40% ☐ 10% to 40% ☐ <10%

Degree of development or human cause disturbance:

☐ <25% ☑ 25% to 75% ☐ >75%

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABR-1

Riparian Function Assessment Answer Sheet

Water Quality

Question 1:	3
Question 2:	3
Question 3:	3
Question 4:	3
Question 5:	2
Total Points:	14

Function:
- [x] High
- [ ] Medium
- [ ] Low

Flood Management

Question 6:	3
Question 7:	3
Question 8:	3
Total Points:	9

Function:
- [x] High
- [ ] Medium
- [ ] Low

Thermal Regulation

Question 9:	3
Question 10:	3
Question 11:	2
Total Points:	8

Function:
- [x] High
- [ ] Medium
- [ ] Low

Wildlife Habitat

Question 12:	3
Question 13:	3
Question 14:	2
Question 15:	3
Question 16:	3
Question 17:	3
Question 18:	1
Question 19:	2
Total Points:	20

Function:
- [x] High
- [ ] Medium
- [ ] Low

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABR-2

Riparian Width Determination

Date: 9/16/98 Investigators: DC

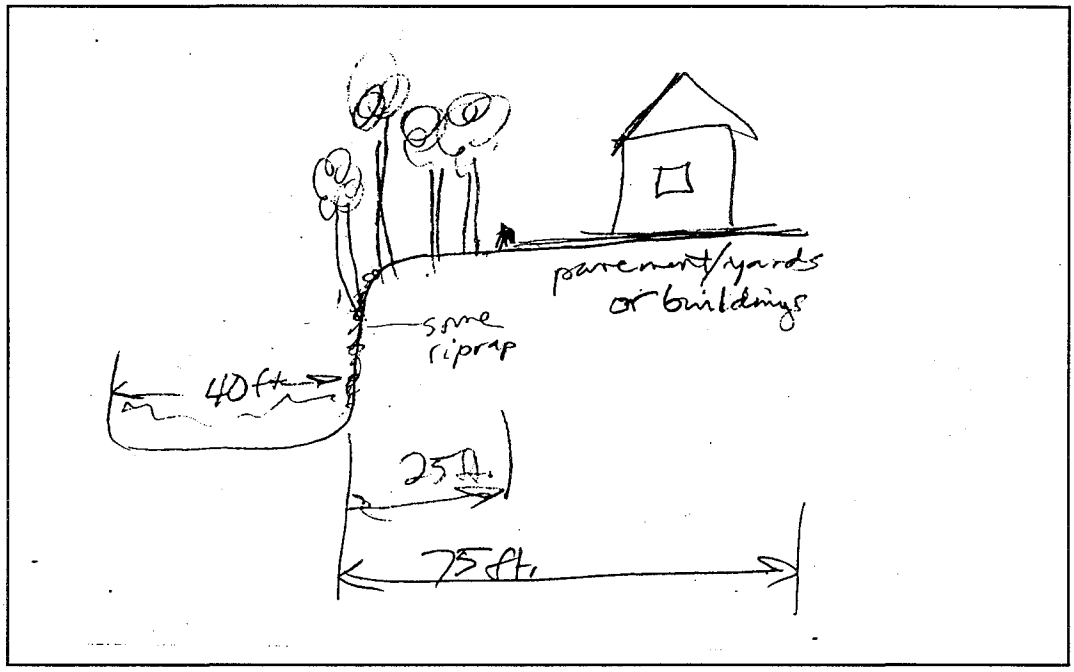
Dominant tree species: Fraxinus latifolia

Potential tree height (PTH)/Width of Riparian Area: 75/25
(Width measured horizontally from edge of water resource)

PTH determined by: ☑ On-site vegetation ☐ Reference site Code:

Comments: This portion of the riparian area is behind industrial/office and residences and is very narrow.

Typical Cross Section:



Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABR-2

Riparian Characterization Form — Part 1

General Information

Date: 9/16/98

On-site ☑ Office ☐ Reach Length: 4,750

Investigators: DC Hydrologic Basin: Abernethy Creek

Water Resource Information

Water Resource: Stream/River ☑ Width: 30
Lake/Pond ☐ Width: 0
Wetland ☐ Width: 0

LWI Wetland Code: AB-1

Water present year-round: Yes

Are salmonids present in the adjacent water resource: Yes

Is the water resource listed for temperature on DEQ's 303(d) list: No

Within FEMA-mapped 100-year floodplain: Yes

Mapped soil series: 67, 82, 92F

Adjacent Land Uses?

Agriculture ☐ Residential ☑ Undeveloped ☐
Commercial ☑ Roads ☑ Forestry ☐

Woody Vegetation	Herbaceous Vegetation
Fraxinus latifolia	Rubus discolor
Alnus rubra	
Acer macrophyllum	
Populus balsamifera	

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABR-2

Riparian Characterization Form — Part 2

Average slope in the riparian area: (Question 1)

☐ <10:1 (10%) ☑ Between 10:1 (10%) and 5:1 (20%) ☐ >5:1 (20%)

Extent of impervious surface within the riparian area: (Question 4)

☐ <10% ☐ 10% to 25% ☑ >25%

☑ **The reach is constricted by man-made features.**

☑ **The orientation allows for shading of the water resource at midday in summer.**

Dominant vegetation layer within the riparian area:

☑ Woody vegetation ☐ Herbaceous vegetation ☐ Bare ground

☑ **Woody vegetation hangs over the edge of the water.**

☐ **Large woody debris in riparian area.**

Percent of water resource bordered by vegetated riparian area at least 30 feet wide:

☐ >40% ☐ 10% to 40% ☑ <10%

Degree of development or human cause disturbance:

☐ <25% ☐ 25% to 75% ☑ >75%

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABR-2

Riparian Function Assessment Answer Sheet

Water Quality

Question 1:	2
Question 2:	3
Question 3:	3
Question 4:	1
Question 5:	3
Total Points:	12

Function:
- [x] High
- [ ] Medium
- [ ] Low

Flood Management

Question 6:	3
Question 7:	3
Question 8:	1
Total Points:	7

Function:
- [ ] High
- [x] Medium
- [ ] Low

Thermal Regulation

Question 9:	3
Question 10:	3
Question 11:	2
Total Points:	8

Function:
- [x] High
- [ ] Medium
- [ ] Low

Wildlife Habitat

Question 12:	2
Question 13:	3
Question 14:	2
Question 15:	1
Question 16:	1
Question 17:	3
Question 18:	1
Question 19:	1
Total Points:	14

Function:
- [ ] High
- [x] Medium
- [ ] Low

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABL-1

Riparian Width Determination

Date: 9/16/98 Investigators: DC

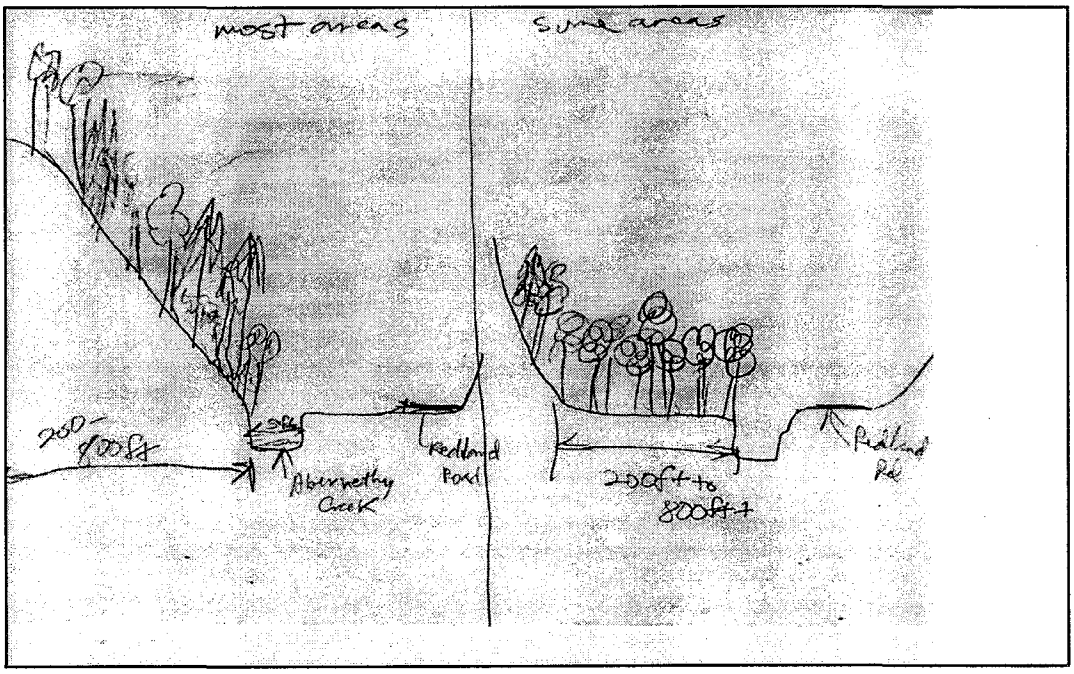
Dominant tree species: Fraxinus latifolia/Alnus rubra

Potential tree height (PTH)/Width of Riparian Area: 75/75
(Width measured horizontally from edge of water resource)

PTH determined by: ☑ On-site vegetation ☐ Reference site Code:

Comments: The riparian area is as narrow as 200 feet but is as broad as 800 feet in some steep hillside areas. Portions of this reach are outside the study area.

Typical Cross Section:



Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABL-1

Riparian Characterization Form — Part 1

General Information

Date: 9/16/98

On-site ☑ Office ☐ Reach Length: 9,000

Investigators: DC Hydrologic Basin: Abernethy Creek

Water Resource Information

Water Resource:			
	Stream/River ☑	Width:	30
	Lake/Pond ☐	Width:	0
	Wetland ☐	Width:	0

LWI Wetland Code: AB-1

Water present year-round: Yes

Are salmonids present in the adjacent water resource: Yes

Is the water resource listed for temperature on DEQ's 303(d) list: No

Within FEMA-mapped 100-year floodplain: Yes

Mapped soil series: 67, 78C, 91B, 91C, 92F

Adjacent Land Uses?

Agriculture ☐	Residential ☑	Undeveloped ☑
Commercial ☐	Roads ☑	Forestry ☐

Woody Vegetation	Herbaceous Vegetation
Pseudotsuga menziesii	Rubus discolor
Alnus rubra	
Fraxinus latifolia	
Populus balsamifera	
Acer macrophyllum	
Salix lasiandra	
Salix scouleriana	

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABL-1

Riparian Characterization Form — Part 2

Average slope in the riparian area: (Question 1)

☐ <10:1 (10%) ☐ Between 10:1 (10%) and 5:1 (20%) ☑ >5:1 (20%)

Extent of impervious surface within the riparian area: (Question 4)

☑ <10% ☐ 10% to 25% ☐ >25%

☐ **The reach is constricted by man-made features.**

☑ **The orientation allows for shading of the water resource at midday in summer.**

Dominant vegetation layer within the riparian area:

☑ Woody vegetation ☐ Herbaceous vegetation ☐ Bare ground

☑ **Woody vegetation hangs over the edge of the water.**

☑ **Large woody debris in riparian area.**

Percent of water resource bordered by vegetated riparian area at least 30 feet wide:

☑ >40% ☐ 10% to 40% ☐ <10%

Degree of development or human cause disturbance:

☐ <25% ☐ 25% to 75% ☐ >75%

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABL-1

Riparian Function Assessment Answer Sheet

Water Quality

Question 1:	1
Question 2:	3
Question 3:	3
Question 4:	3
Question 5:	2
Total Points:	12

Function:
- [x] High
- [ ] Medium
- [ ] Low

Flood Management

Question 6:	3
Question 7:	3
Question 8:	3
Total Points:	9

Function:
- [x] High
- [ ] Medium
- [ ] Low

Thermal Regulation

Question 9:	3
Question 10:	3
Question 11:	2
Total Points:	8

Function:
- [x] High
- [ ] Medium
- [ ] Low

Wildlife Habitat

Question 12:	3
Question 13:	3
Question 14:	2
Question 15:	3
Question 16:	3
Question 17:	3
Question 18:	1
Question 19:	3
Total Points:	21

Function:
- [x] High
- [ ] Medium
- [ ] Low

Urban Riparian Inventory and Assessment

Project Number: 7971165

Project Name: City of Oregon City

Riparian Code: ABL-2

Riparian Width Determination

Date: 9/16/98 Investigators: DC

Dominant tree species: *Acer macrophyllum*

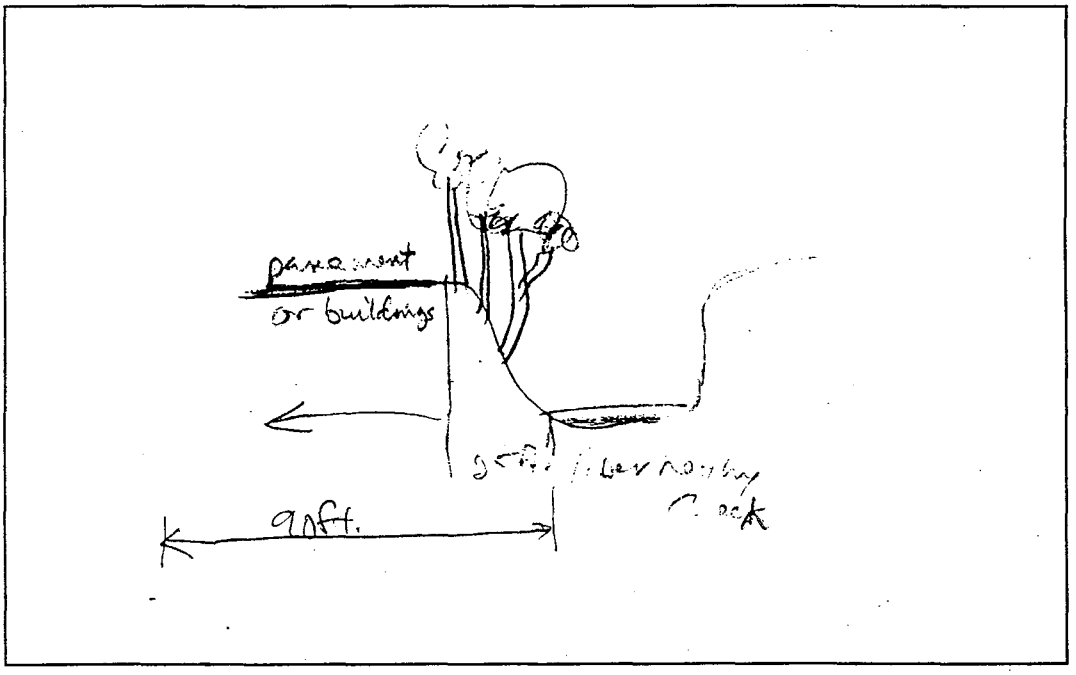
Potential tree height (PTH)/Width of Riparian Area: 90/25

(Width measured horizontally from edge of water resource)

PTH determined by: ☑ On-site vegetation ☐ Reference site Code:

Comments: This riparian area is heavily developed with parking lots, roadways, and buildings with a strip of vegetation on top of bank and slope of bank.

Typical Cross Section:



Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABL-2

Riparian Characterization Form — Part 1

General Information

Date: 9/16/98

On-site ☑ Office ☐ Reach Length: 1,050

Investigators: DC Hydrologic Basin: Abernethy Creek

Water Resource Information

Water Resource:			
	Stream/River ☑	Width:	30
	Lake/Pond ☐	Width:	0
	Wetland ☐	Width:	0

LWI Wetland Code: AB-1

Water present year-round: Yes

Are salmonids present in the adjacent water resource: Yes

Is the water resource listed for temperature on DEQ's 303(d) list: No

Within FEMA-mapped 100-year floodplain: Yes

Mapped soil series: 67, 82

Adjacent Land Uses?

Agriculture ☐	Residential ☐	Undeveloped ☐
Commercial ☑	Roads ☑	Forestry ☐

Woody Vegetation	Herbaceous Vegetation
Fraxinus latifolia	Rubus discolor
Alnus rubra	
Populus balsamifera	
Acer macrophyllum	

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABL-2

Riparian Characterization Form — Part 2

Average slope in the riparian area: (Question 1)

☐ <10:1 (10%) ☑ Between 10:1 (10%) and 5:1 (20%) ☐ >5:1 (20%)

Extent of impervious surface within the riparian area: (Question 4)

☐ <10% ☐ 10% to 25% ☑ >25%

☑ **The reach is constricted by man-made features.**

☑ **The orientation allows for shading of the water resource at midday in summer.**

Dominant vegetation layer within the riparian area:

☑ Woody vegetation ☐ Herbaceous vegetation ☐ Bare ground

☑ **Woody vegetation hangs over the edge of the water.**

☐ **Large woody debris in riparian area.**

Percent of water resource bordered by vegetated riparian area at least 30 feet wide:

☐ >40% ☐ 10% to 40% ☑ <10%

Degree of development or human cause disturbance:

☐ <25% ☐ 25% to 75% ☑ >75%

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: ABL-2

Riparian Function Assessment Answer Sheet

Water Quality

Question 1:	2
Question 2:	3
Question 3:	3
Question 4:	1
Question 5:	3
Total Points:	12

Function:
- [x] High
- [ ] Medium
- [ ] Low

Flood Management

Question 6:	3
Question 7:	3
Question 8:	1
Total Points:	7

Function:
- [ ] High
- [x] Medium
- [ ] Low

Thermal Regulation

Question 9:	3
Question 10:	3
Question 11:	2
Total Points:	8

Function:
- [x] High
- [ ] Medium
- [ ] Low

Wildlife Habitat

Question 12:	2
Question 13:	3
Question 14:	2
Question 15:	1
Question 16:	1
Question 17:	3
Question 18:	1
Question 19:	1
Total Points:	14

Function:
- [ ] High
- [x] Medium
- [ ] Low

OREGON CITY LOCAL WETLANDS INVENTORY

- Stream Summary Sheet -

Date(s) of Field Verification: 7/16/98

Mapping Code: NE-7

Investigator(s): JG/PO

Size (acres): 1.3

Location

Legal: T3S R 2E S4

Other: NW of intersection of Hwy. 213 and Beavercreek Rd.

Basin: Newell Creek

Comments:

This stream is in a very steep, narrow canyon oriented generally north-south. Water flows into the wetland through a culvert in the northwestern corner of the intersection of Highway 213 and South Beavercreek Road. The water exits the culvert and flows down a concrete chute for an estimated 40 to 50 feet before entering a streambed that is composed predominantly of large boulders. The flow in this stream appears to be perennial, based on the quantity of water observed during the inventory field work. However, a major source of water for the stream is the Inskeep Environmental Learning Center wetland system, which receives much of its water intermittently from a pumping system. The stream contains a large quantity of woody debris, and is well shaded by the trees in the canyon. The steepness of the canyon and the rocky nature of the substrate prohibit the growth of emergent wetland vegetation at the water's edge.

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: NEL-1

Riparian Width Determination

Date: 7/16/98 Investigators: JG/PO

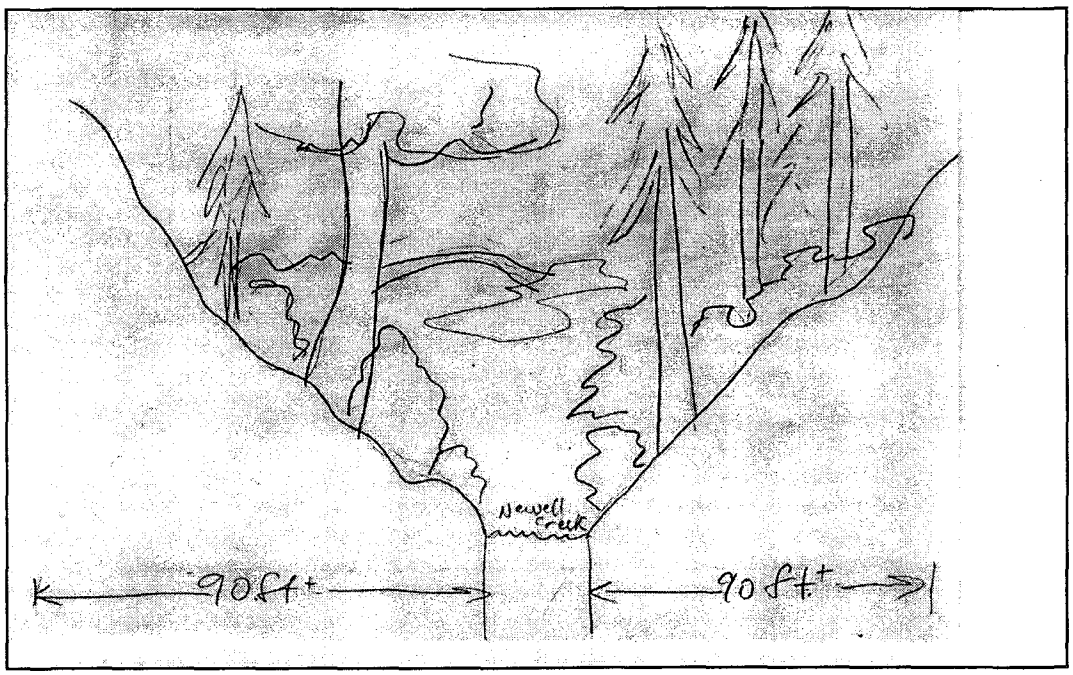
Dominant tree species: Acer macrophyllum

Potential tree height (PTH)/Width of Riparian Area: 90/90
(Width measured horizontally from edge of water resource)

PTH determined by: ☑ On-site vegetation ☐ Reference site Code:

Comments:

Typical Cross Section:



Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: NEL-1

Riparian Characterization Form — Part 1

General Information

Date: 7/16/98

On-site ☑ Office ☐ Reach Length: 1,600

Investigators: JG/PO Hydrologic Basin: Newell Creek

Water Resource Information

Water Resource: Stream/River ☑ Width: 8
Lake/Pond ☐ Width: 0
Wetland ☐ Width: 0

LWI Wetland Code: NE-7

Water present year-round: Yes

Are salmonids present in the adjacent water resource: Yes

Is the water resource listed for temperature on DEQ's 303(d) list: No

Within FEMA-mapped 100-year floodplain: No

Mapped soil series: 8B, 92F

Adjacent Land Uses?

Agriculture ☐ Residential ☑ Undeveloped ☐
Commercial ☐ Roads ☑ Forestry ☐

Woody Vegetation	Herbaceous Vegetation
Acer macrophyllum	Polystichum munitum
Thuja plicata	Hydrophyllum tenuipes
Alnus rubra	Urtica dioica
Acer circinatum	Geranium robertianum
Oemleria cerasiformis	Claytonia sibirica
Rubus ursinus	
Ilex aquifolium	
Vaccinium occidentale	

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: NEL-1

Riparian Characterization Form — Part 2

Average slope in the riparian area: (Question 1)

☐ <10:1 (10%) ☐ Between 10:1 (10%) and 5:1 (20%) ☑ >5:1 (20%)

Extent of impervious surface within the riparian area: (Question 4)

☑ <10% ☐ 10% to 25% ☐ >25%

☐ **The reach is constricted by man-made features.**

☑ **The orientation allows for shading of the water resource at midday in summer.**

Dominant vegetation layer within the riparian area:

☐ Woody vegetation ☐ Herbaceous vegetation ☐ Bare ground

☑ **Woody vegetation hangs over the edge of the water.**

☑ **Large woody debris in riparian area.**

Percent of water resource bordered by vegetated riparian area at least 30 feet wide:

☑ >40% ☐ 10% to 40% ☐ <10%

Degree of development or human cause disturbance:

☑ <25% ☐ 25% to 75% ☐ >75%

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: NEL-1

Riparian Function Assessment Answer Sheet

Water Quality

Question 1:	1
Question 2:	3
Question 3:	3
Question 4:	3
Question 5:	2
Total Points:	12

Function:
- [x] High
- [ ] Medium
- [ ] Low

Flood Management

Question 6:	3
Question 7:	3
Question 8:	3
Total Points:	9

Function:
- [x] High
- [ ] Medium
- [ ] Low

Thermal Regulation

Question 9:	3
Question 10:	3
Question 11:	2
Total Points:	8

Function:
- [x] High
- [ ] Medium
- [ ] Low

Wildlife Habitat

Question 12:	3
Question 13:	3
Question 14:	2
Question 15:	3
Question 16:	3
Question 17:	3
Question 18:	1
Question 19:	3
Total Points:	21

Function:
- [x] High
- [ ] Medium
- [ ] Low

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: NER-1

Riparian Width Determination

Date: 7/16/98 Investigators: JG/PO

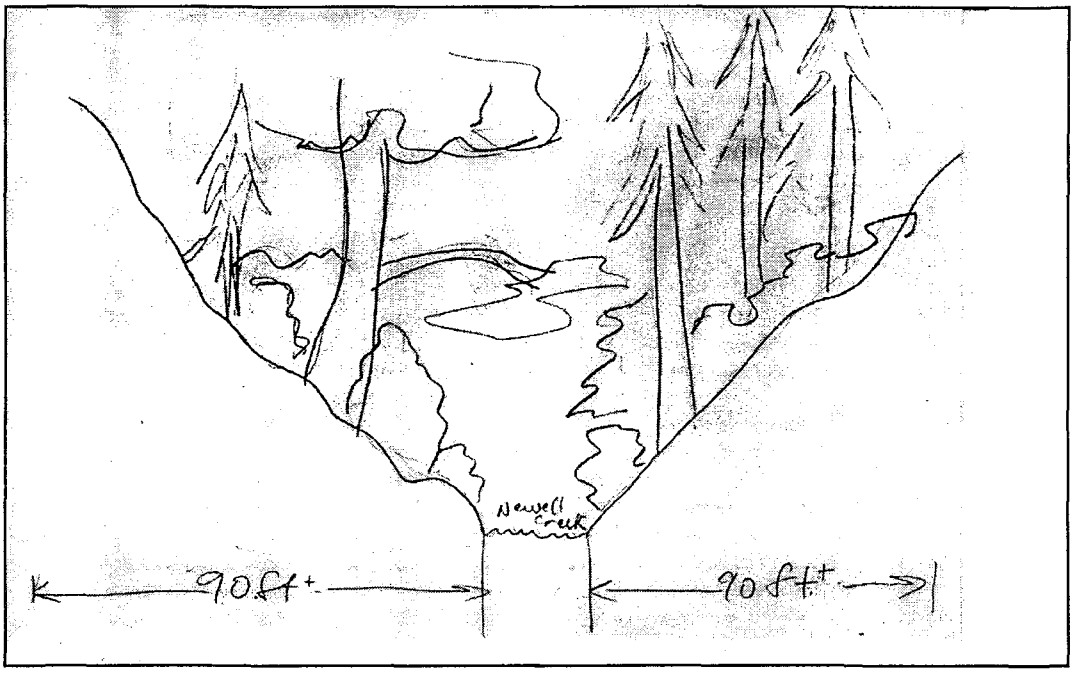
Dominant tree species: Acer macrophyllum

Potential tree height (PTH)/Width of Riparian Area: 90/90
(Width measured horizontally from edge of water resource)

PTH determined by: ☑ On-site vegetation ☐ Reference site Code:

Comments:

Typical Cross Section:



Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: NER-1

Riparian Characterization Form — Part 1

General Information

Date: 7/16/98

On-site ☑ Office ☐ Reach Length: 1,600

Investigators: JG/PO Hydrologic Basin: Newell Creek

Water Resource Information

Water Resource: Stream/River ☑ Width: 8
Lake/Pond ☐ Width: 0
Wetland ☐ Width: 0

LWI Wetland Code: NE-7

Water present year-round: Yes

Are salmonids present in the adjacent water resource: Yes

Is the water resource listed for temperature on DEQ's 303(d) list: No

Within FEMA-mapped 100-year floodplain: No

Mapped soil series: 8B, 92F

Adjacent Land Uses?

Agriculture ☐ Residential ☑ Undeveloped ☐
Commercial ☐ Roads ☑ Forestry ☐

Woody Vegetation	Herbaceous Vegetation
Acer macrophyllum	Polystichum munitum
Thuja plicata	Hydrophyllum tenuipes
Alnus rubra	Urtica dioica
Acer circinatum	Geranium robertianum
Oemleria cerasiformis	Claytonia sibirica
Rubus ursinus	
Ilex aquifolium	
Vaccinium occidentale	

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: NER-1

Riparian Characterization Form — Part 2

Average slope in the riparian area: (Question 1)

☐ <10:1 (10%) ☐ Between 10:1 (10%) and 5:1 (20%) ☑ >5:1 (20%)

Extent of impervious surface within the riparian area: (Question 4)

☑ <10% ☐ 10% to 25% ☐ >25%

☐ **The reach is constricted by man-made features.**

☑ **The orientation allows for shading of the water resource at midday in summer.**

Dominant vegetation layer within the riparian area:

☑ Woody vegetation ☐ Herbaceous vegetation ☐ Bare ground

☑ **Woody vegetation hangs over the edge of the water.**

☑ **Large woody debris in riparian area.**

Percent of water resource bordered by vegetated riparian area at least 30 feet wide:

☑ >40% ☐ 10% to 40% ☐ <10%

Degree of development or human cause disturbance:

☑ <25% ☐ 25% to 75% ☐ >75%

Urban Riparian Inventory and Assessment

Project Number: 7971165
Project Name: City of Oregon City
Riparian Code: NER-1

Riparian Function Assessment Answer Sheet

Water Quality

Question 1:	1
Question 2:	3
Question 3:	3
Question 4:	3
Question 5:	2
Total Points:	12

Function:
- [x] High
- [ ] Medium
- [ ] Low

Flood Management

Question 6:	3
Question 7:	3
Question 8:	3
Total Points:	9

Function:
- [x] High
- [ ] Medium
- [ ] Low

Thermal Regulation

Question 9:	3
Question 10:	3
Question 11:	2
Total Points:	8

Function:
- [x] High
- [ ] Medium
- [ ] Low

Wildlife Habitat

Question 12:	3
Question 13:	3
Question 14:	2
Question 15:	3
Question 16:	3
Question 17:	3
Question 18:	1
Question 19:	3
Total Points:	21

Function:
- [x] High
- [ ] Medium
- [ ] Low

OREGON CITY LOCAL WETLANDS INVENTORY

- Stream Summary Sheet -

Date(s) of Field Verification: 7/21/98

Mapping Code: CA-8

Investigator(s): KC/PO

Size (acres): 0.3

Location

Legal: T3S R2E S15

Other: Glen Oak Rd., W of Beavercreek Rd.

Basin: Caufield Creek

Comments:

OFF-SITE DETERMINATION. Access was denied on the day of the visit (although permission had previously been granted). One of the property owners says there is water in the drainage year-round as a result of construction of the surrounding subdivisions. The stream is piped underground in the subdivisions and flows above ground on three lots for approximately 400 feet. Stream-side vegetation appears minimal from the road side.

OREGON CITY LOCAL WETLANDS INVENTORY

Stream Summary Sheet

Date(s) of Field Verification: 6/14/97 & 7/15/98

Mapping Code: CO-2

Investigator(s): DC/JF/KC/ES

Size (acres): 0.6

Location

Legal: T2S R2E S31, T3S R2E S6

Other: Between Hwy.99 E and Coffee Creek Falls

Basin: Coffee Creek

Comments:

Coffee Creek flows from the south passing through landscaped residential neighborhoods. Where the stream intersects South End Road, it descends an approximately 30 foot waterfall and continues flowing through a culvert under South End Road. As the creek flows north it runs through a steep forested ravine, then enters another residential area, flowing between and under houses. The stream is then diverted under ground to a culvert system on to the Willamette River.

OREGON CITY LOCAL WETLANDS INVENTORY
Stream Summary Sheet

Date(s) of Field Verification: 07/16/98

Mapping Code: JA-1

Investigator(s): KC/ES

Size (acres): 0.1

Location

Legal: T2S R2E S32

Other: SW of intersection of Division and 15th Streets

Basin: John Adams

Comments:

The stream flows through a forested ravine east of the Oregon City High School football field and enters a culvert at the ravine/ball field boundary. The stream channel is incised about 1-2 feet deep and is about 3 feet wide. There is minimal herbaceous growth on the stream banks within 10 feet of the channel (lower 200-300 feet of the ravine). The ravine bottom broadens to the east, where the stream is less incised. The soil adjacent to the stream is moist to saturated in this section. Herbaceous species are also more numerous here (skunk cabbage [Lysichitum americanum] borders the stream).

OREGON CITY LOCAL WETLANDS INVENTORY

- Stream Summary Sheet -

Date(s) of Field Verification: 07/16/98

Mapping Code: JA-2

Investigator(s): KC/ES

Size (acres): 0.1

Location

Legal: T2S R2E S32

Other: SW of 15th and Madison

Basin: John Adams

Comments:

OFF-SITE DETERMINATION. A stream flows through a deep ravine (an estimated 100 feet deep) from the east. The slopes of the ravine are dominated by English ivy (Hedera helix) and bigleaf maple (Acer macrophyllum). Trees provide substantial shading to the stream (>75% closure). There is minimal herbaceous coverage from the stream edge out to approximately 10 feet on both sides. The stream enters a culvert beneath Madison St. flowing west. The ravine west of Madison is similar in character to the eastern side, though bigleaf maple is more dense. The stream was not visible in the western side ravine from the viewpoint on Madison St.

OREGON CITY LOCAL WETLANDS INVENTORY

- Stream Summary Sheet -

Date(s) of Field Verification: 7/21/98

Mapping Code: LI-1

Investigator(s): KC/PO

Size (acres): 0.3

Location

Legal: T2S R2E S29

Other: NE of intersection of Hwy. 213 and Redland Rd.

Basin: Livesay Creek

Comments:

This is a segment of Livesay Creek with its associated floodplain. There is no evidence of wetland characteristics outside the stream channel. The creek has a small, unauthorized dam with an associated irrigation pump. A tarp is stretched across the stream channel. The pump has subsequently been shut down by the Oregon Water Resource Department because of the lack of a water rights permit. The owner of the pump has been asked to remove the tarp as well. The associated floodplain on the northeastern side of the creek is approximately 50 feet wide. The southwestern riparian area has an approximately 60% grade. The stream is highly modified, with an incised channel and the above-mentioned dam system. Enhancement potential for this area increases significantly with removal of the tarp and dam.

OREGON CITY LOCAL WETLANDS INVENTORY

- Stream Summary Sheet -

Date(s) of Field Verification: 7/21/98

Mapping Code: MU-7

Investigator(s): KC/PO

Size (acres): 1

Location

Legal: T3S R2E S7

Other: E of Leland Rd., W of Meyers Rd.

Basin: Mud Creek

Comments:

OFF-SITE DETERMINATION. This drainage is a forested system connected to a ditch that carries runoff from adjacent housing. It appears probable that the ditch was formerly a stream.

OREGON CITY LOCAL WETLANDS INVENTORY

Stream Summary Sheet

Date(s) of Field Verification: 7/9/97

Mapping Code: NE-4

Investigator(s): DC/CM

Size (acres): 0.9

Location

Legal: T3S R2E S5

Other: N of Beaver Creek Rd., E of Mollala Ave.

Basin: Newel Creek

Comments:

This site is a steep, deeply cut stream channel with bare soil or rocky bottom. The stream is in a steeply sloped, forested area. Vegetative cover is scant in the wetland fringe along the stream. The stream may be perennial or may flow late into summer.

OREGON CITY LOCAL WETLANDS INVENTORY

- Stream Summary Sheet -

Date(s) of Field Verification: 6/7/97

Mapping Code: NE-6

Investigator(s): DC/CM

Size (acres): 0.3

Location

Legal: T3S R2E S5

Other: NW of intersection of Beavercreek Rd. & Hwy. 213

Basin: Newell Creek

Comments:

This narrow, intermittent stream is completely shaded by trees and shrubs. The lower (northern) portion of the stream has large boulders and logs dumped into and along it. The stream has a steep gradient and is in a steep-sloped canyon.

OREGON CITY LOCAL WETLANDS INVENTORY

- Stream Summary Sheet -

Date(s) of Field Verification: 9/23/98

Mapping Code: NE-10

Investigator(s): DC, CM, PO, KC

Size (acres): 0.1

Location

Legal: T2S R2E S32; T3S R2E S5

Other: West of Peter Skene Way, east of Cascade St. and north of Barclay Hills Dr.

Basin: Newell Creek

Comments:

This is an intermittent stream with vegetation above on the banks. This stream has a moderate to steep gradient and flows in a steep-sided canyon. The upper part of the stream starts in Scouler's willow (Salix scouleriana) and Himalayan blackberry (Rubus discolor). The lower (northern) portion is in a forest. The riparian buffer adjacent to the stream is broad but steep, with houses on the top of the slope.

OREGON CITY LOCAL WETLANDS INVENTORY

Stream Summary Sheet

Date(s) of Field Verification: 9/16/98

Mapping Code: NE-11

Investigator(s): DC, CM, PO, KC

Size (acres): 0.1

Location

Legal: T2S R2E S32; T3S R2E S5

Other: East of Peter Skene Way, west of Chickaree Dr. and north of Barclay Hills Dr.

Basin: Newell Creek

Comments:

This is an intermittent stream with vegetation on the banks above. This stream has two small tributaries. Soon after they join the stream there is a 25-foot waterfall into the head of a vertical, banked, bowl-shaped canyon. The stream is unvegetated. An old, concrete dam was built across the western tributary, but it failed and the stream now flows underneath it. The vegetation buffer is wide but steep with houses or development near the top of the slope.

OREGON CITY LOCAL WETLANDS INVENTORY

- Stream Summary Sheet -

Date(s) of Field Verification: 07/16/98

Mapping Code: SI-1

Investigator(s): KC/ES

Size (acres): 1.6

Location

Legal: T2S R2E S31,32 T3S R2E S6

Other: Singer Creek Park S of SE Pearl St.

Basin: Singer Creek

Comments:

This stream flows through a steeply sloped ravine with minimal stream bank throughout. The channel bottom is very rocky. Along the upper third of the stream there are discrete pockets of wetland vegetation, where the stream gradient eases and the channel widens. Vegetation includes rushes (Juncus sp.), sedges (Carex sp.), and Pacific ninebark (Physocarpus capitatus). A ravine just south of SE Pearl St. is heavily congested with Himalayan blackberry (Rubus discolor), English ivy (Hedera helix), bigleaf maple (Acer macrophyllum), and morning glory (Convulvulus arvensis).

OREGON CITY LOCAL WETLANDS INVENTORY

- Stream Summary Sheet -

Date(s) of Field Verification: 07/16/98

Mapping Code: SI-2

Investigator(s): KC/ES

Size (acres): 1.3

Location

Legal: T2S R2E S31

Other: North of SE Pearl St.

Basin: Singer Creek

Comments:

This site is a continuation of the ravine in SI-1, but separated from it by SE Pearl St. The site consists of a ravine with a dense primary overstory of bigleaf maple (Acer macrophyllum) and some Douglas-fir (Pseudotsuga Menziesii). Steep slopes are covered with English ivy (Hedera helix), Japanese knotweed (Polygonum cuspidatum), and Himalayan blackberry (Rubus discolor). The streamflow appears intermittent.



Appendix C

DSL OFWAM Manual

APPENDIX C

SUMMARY OF OFWAM ASSESSMENT CATEGORIES

Wetland functions and characteristics assessed by the Oregon Freshwater Assessment Methodology (OFWAM) are summarized below. The results of the assessment are used to determine the significance of each wetland. For complete assessment information, consult the OFWAM document.

Wetland Functions

WILDLIFE HABITAT: Wetlands provide habitat for many wildlife species. A single wetland often cannot satisfy all requirements for wildlife use, so its proximity to other bodies of water or upland areas is important. Buffers and corridors are also essential for this reason, and they reduce human disturbance. Many species also have special habitat requirements. Good water quality is necessary for amphibians and mammals; structural diversity is important for birds; and a combination of open water and grazing areas is important for waterfowl.

OFWAM evaluates the habitat diversity for species usually associated with wetlands, without emphasizing one particular species. Wetlands assessed by OFWAM can provide diverse habitat for wildlife, habitat for some wildlife species, or have a wildlife habitat function that is lost or not present.

FISH HABITAT: Wetlands that contribute to habitat for fish include areas with dense overhanging vegetation. This vegetation provides shade, cover, and food sources to related waterways and lakes. Wetlands also provide spawning, rearing, and resting opportunities for fish. However, a wetland need not actually contain fish to contribute to fish habitat, because wetlands may perform important functions for fish-bearing waters downstream.

OFWAM evaluates how a wetland contributes to fish habitat in streams, ponds, or lakes associated with a wetland. The questions are suitable for both warmwater and coldwater fish, and no particular species is emphasized. Wetlands assessed by OFWAM have a fish habitat function that is intact, impacted or degraded, or lost or not present.

WATER QUALITY (pollutant removal):

Sediment Trapping: During periods of heavy rainfall, water runoff may cause erosion and increase solids suspended in receiving surface waters. The excess sediment entering water systems can damage aquatic ecosystems. Sediment accumulation in stream bottoms can smother spawning areas and kill aquatic insect larvae. It also can reduce the storage capacity of downstream water supply reservoirs.

Wetlands perform an important function by trapping sediment from waters that pass through them. As water flows through the wetlands, it is slowed by vegetation, and

sediment settles to the bottom before the water moves farther downstream. As much as 90% of the solids suspended in the water may be removed as the water moves through the wetland, resulting in cleaner water entering rivers, lakes, and estuaries.

Nutrient Attenuation: Nitrogen and phosphorus are the two nutrients most often associated with water pollution. They are also main ingredients of fertilizers used on agricultural fields and lawns, and both are found in high concentrations in discharges from sewage treatment plants and livestock operations. Excessive amounts of nitrogen and phosphorus in lakes and slow-moving streams can cause algal blooms and subsequent oxygen deficiencies, which may kill fish and reduce water quality. The processes that occur as a result of excess nutrients are combined under the term "eutrophication." Within limits, wetlands can reduce nutrient levels so the effects of eutrophication on downstream areas are prevented or reduced.

OFWAM evaluates the potential of a wetland to reduce the impacts of excess nutrients in stormwater runoff on downstream waters. A wetland assessed by OFWAM can have a water quality function that is intact, impacted or degraded, or lost or not present.

HYDROLOGIC CONTROL (flood control and water supply): Wetlands function as natural water storage areas during periods of high runoff and stream flooding. At times, they act as flood regulators by holding floodwaters, then slowly releasing them downstream. This temporary storage reduces the amount of water downstream during floods, thereby reducing peak flows. Through this flood storage mechanism, wetlands associated with tributaries of streams or rivers can prevent water from all tributaries reaching the stream or river at the same time (this is called desynchronization). Wetlands also can act as floodwater "brakes." For example, water flowing through riverine wetlands during floods is slowed by trees, shrubs, rushes, and other wetland vegetation. Wetlands acting as brakes can reduce flood peaks, thereby reducing flood damage, bank and bed erosion, and other adverse effects caused by fast-moving water.

Wetlands also have long-term water holding abilities. Wetlands may store water for longer periods, sometimes for months. The slow draining of these wetlands to surface water or groundwater as the water level in the wetland recedes may contribute to the maintenance of base flows in streams connected hydrologically to the wetland.

OFWAM evaluates the effectiveness of a wetland to reduce downstream flood peaks and store floodwaters. A wetland assessed by OFWAM can have a hydrologic control function that is intact, impacted or degraded, or lost or not present.

EDUCATION: Field trips to wetlands are an important part of the educational experience, providing students opportunities to learn about ecological principles. OFWAM bases the educational assessment on the accessibility and diversity of the wetlands. Wetlands that provide fish and wildlife habitat and permit access to other natural features allow a broader course of study.

OFWAM evaluates the suitability of a wetland to provide educational opportunity and act as an "outdoor classroom." A wetland assessed by OFWAM can have educational use, potential for educational use, or not be appropriate for educational use.

RECREATION: Many recreational activities take place in and around wetlands. Wetlands associated with open bodies of water also may support boating and fishing. Many people simply enjoy the beauty and sounds of nature and spend time walking in or near wetlands observing plant and animal life.

OFWAM evaluates the suitability of a wetland and associated watercourses for non-powered boating, fishing, and similar recreational activities. A wetland assessed by OFWAM can provide, have the potential to provide, not provide, or not be appropriate for recreational opportunities.

Wetland Characteristics

ENHANCEMENT POTENTIAL: Enhancement potential represents how well a wetland might respond to the mitigation of past environmental impacts. The recovery of a wetland, and in particular its wetland function, depends on the site's hydrology, its soils and substrate, and the presence of environmental buffers surrounding the wetland.

OFWAM evaluates the suitability of a degraded wetland for enhancement. A wetland fulfilling this condition does not provide one or more of the functions assessed by OFWAM. A wetland fulfilling this condition, therefore, would be of lower overall quality than a wetland providing such features as wildlife or fish habitat. A wetland assessed by OFWAM can have high, moderate, or little enhancement potential.

AESTHETIC QUALITY: Although this is a subjective index, it is included to assess the open space and overall pleasing qualities of wetlands to local residents and users. The assessment assumes the user will be visiting the wetland, not just driving by in a car, bus, or on a bicycle. Wetlands can be areas of scenic beauty. Most often they are viewed from along a stream, from a canoe, along a nature trail, or from an overlook. The assessment area may include the entire wetland or only a portion, such as an area clearly visible from a road or stream. Thus, this assessment can be based on an average of several viewpoints or on one outstanding viewpoint.

OFWAM evaluates the visual and aesthetic quality of the wetland. Wetlands can be considered pleasing, moderately pleasing, or not pleasing.

SENSITIVITY TO IMPACT: The wetland's ability to provide ecological function depends on its condition. If past environmental impacts have affected its ability to sustain itself, its ability to recover from future impacts is diminished. Various factors, such as vegetation type, contribute to a wetland's sensitivity. Forested wetland types, for example, are considered particularly sensitive, because their vegetation structure is complex and slow to recover once disturbed. Also, a wetland is considered sensitive to impact if the quantity and quality of its water supply has been altered or degraded, and if

the intensity of adjacent land use suggests the impairment is permanent. Under such circumstances, the wetland will have lost some of its natural capacity to recover form impacts. Small, incremental impacts on sensitive wetlands can cause broader, secondary effects throughout the wetland system. A wetland's resilience depends on whether adverse effects caused by future impacts will be localized or spread throughout the wetland and beyond into other ecosystems. The sensitivity to impact index is an indication of risk to the wetland from future changes in the watershed and land surrounding it.

This index evaluates whether an affected or lost wetland function can be restored at a degraded wetland site. It does **not** evaluate the enhancement potential of changing the vegetation through exotic weed removal, which is considered to be a management issue. Wetland enhancement provides opportunities to connect wetlands and adjacent natural areas, thus creating larger natural systems that provide corridors for animal movement.



Appendix D

DSL Riparian Manual

APPENDIX D

SUMMARY OF RIPARIAN GUIDE ASSESSMENT CATEGORIES

Riparian characteristics and functions assessed by the Urban Riparian Inventory and Assessment Guide (Riparian Guide) are summarized below. For complete assessment information, consult the Riparian Guide document.

Riparian Functions

WATER QUALITY: Erosion risk is directly related to slope: The steeper the slope, the greater the risk of erosion. Vegetation reduces erosion by stabilizing soil and banks through the binding action of roots. Woody vegetation provides the most effective stabilization because of its root mass. Declines in urban water quality can be linked directly to an increase in impervious surfaces. Impervious surfaces increase the frequency and quantity of runoff, contribute pollutants, and reduce natural infiltration provided by soil and vegetation.

FLOOD MANAGEMENT: The ability of the riparian area to provide a flood management function depends on its potential to store or detain floodwaters temporarily. Floodwaters detained in the riparian area infiltrate into the soil and are slowly released downstream. Woody vegetation reduces the velocity of floodwaters by providing resistance, which increases detention time in the riparian area, allowing the water to infiltrate into the soil. Both of these factors reduce downstream flooding. Channelization of streams and armoring of banks (e.g., riprap, walls, concrete) increase the velocity of floodwaters. Although channelization and armoring may reduce local flooding by separating the water resource from its floodplain, these measures often increase the risk of flooding downstream.

THERMAL REGULATION: In Oregon, vegetation on the southern side of an east-west-oriented water resource has the highest potential of providing shade in the summer. The ability of vegetation to provide shade is directly related to the height of the vegetation. In general, tall, woody vegetation provides more shade than herbaceous vegetation. Vegetation overhanging a water resource provides shade, creating microclimates.

WILDLIFE HABITAT: A vegetated riparian area increases the quality of wildlife habitat by providing food, cover, and nesting opportunities. Vertical complexity of vegetation increases the variety of niches available to wildlife. In general, tall, woody vegetation provides more food, cover, and nesting habitat for a variety of wildlife than herbaceous vegetation. Overhanging woody vegetation contributes leaves, woody debris, and insects to the water resource. It also shades the water resource and creates microclimates. Large woody debris in the riparian area provides cover for a variety of small mammals, birds, amphibians, and insects. It can also be transported to the aquatic system in flood events, where it can enhance in-stream fish habitat. More than one type of water resource within or immediately adjacent to the riparian reach increases the

complexity and quality of wildlife habitat. Human-caused disturbance/development within the riparian area directly affects wildlife use. The proximity of human activities may negatively affect sensitive wildlife species that cannot tolerate noise, light, or traffic.



Appendix E

Local Wetland Significance Assessment Sheets

Oregon City
Local Wetland Significance Assessment

WetlandCode: AB-2

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: AB-3

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: AB-4

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: AC-1

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

Yes Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: AC-2

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

Yes Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

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No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: AC-3

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **Yes** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

Yes Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: AC-4

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control. Yes per summary sheet

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

Yes Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CA-1

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

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No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CA-2

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City Local Wetland Significance Assessment

WetlandCode: CA-3

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CA-4

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **Yes** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CA-5

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **Yes** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CA-6a

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CA-7

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

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No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CL-2

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

Yes Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

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No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CL-3

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CL-4

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

Yes Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CO-1

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

Yes Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CO-3

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

Yes Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

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No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CO-4

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CP-1

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: CP-2

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City Local Wetland Significance Assessment

WetlandCode: CP-3

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

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No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: FO-1

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

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No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: LI-2

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **Yes** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

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No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: LI-3

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: LI-4

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: LI-5

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: MU-1

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: MU-2

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: MU-3

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City Local Wetland Significance Assessment

WetlandCode: MU-4

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: MU-5

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: MU-6

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

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No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: MU-8

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: NE-1

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

Yes Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: NE-2

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City Local Wetland Significance Assessment

WetlandCode: NE-3

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

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No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: NE-5

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

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No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: NE-8

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: NE-9

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **Yes** wildlife habitat,
- **Yes** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: PP-1

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: PP-2

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: PP-3

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

City of Oregon City
Local Wetland Significance Assessment

WetlandCode: PP-4

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

B. "IN"

No Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **No** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

No Contains one or more uncommon wetland plant communities including those listed in the Oregon Natural Heritage Program's CLASSIFICATION AND CATALOG OF NATIVE WETLAND PLANT COMMUNITIES IN OREGON as G1-G3 and S1-S3.

No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: SE-1

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City
Local Wetland Significance Assessment

WetlandCode: SE-2

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

Oregon City Local Wetland Significance Assessment

WetlandCode: SE-3

A. "OUT" Test

No Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland MEETS the criteria for identification as a Local Significant Wetland

B. "IN"

Yes Wetlands that score the highest rank for ANY of the four ecological functions addressed by OFWAM or equivalent methodology:

- **No** wildlife habitat,
- **No** fish habitat,
- **No** water quality,
- **Yes** hydrologic control.

No Wetlands that (1) are rated in either the highest or second highest category for water quality (in OFWAM or equivalent) AND that (2) border a water quality-limited stream as listed by DEQ. Dedicated stormwater detention swales not included.

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No Inhabited by any species listed by the federal or state government as a sensitive, threatened or endangered species in Oregon (unless consultation with appropriate agency deems the site not important for the maintenance of the species.

No Wetland is a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or Land Trust.

No Wetland is specifically protected as a wetland resource in a recognized federal, state or local management plan, e.g., for a park, refuge, or scenic river.

No Wetland rates in either the highest or second highest category for Fish Habitat in OFWAM and is located adjacent to a stream segment that is mapped by ODFW as habitat for "Indigenous anadromous salmonids."

No OPTIONAL CRITERION (at discretion of local government): Wetland represents a LOCALLY unique plant community.

No OPTIONAL CRITERION (at discretion of local government): Wetland rates highest rank for education potential and there is documented use for educational purposes by a school or organization.

City of Oregon City
Local Wetland Significance Assessment

WetlandCode: TH-1

A. "OUT" Test

Yes Wetlands artificially CREATED ENTIRELY FROM UPLAND that are:

(a) created for the purpose of controlling, storing, or maintaining stormwater;
(b) active surface mining ponds;
(c) ditches without free and open connection to waters of the state AND without fish;
(d) <1 acre and unintentionally created from irrigation leak or construction activity;
(e) of any size and created for the purpose of wastewater treatment, stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

No Documented as being contaminated by hazardous substances, materials or wastes ("Hazmat sites").

This wetland does NOT meet the criteria for identification as a Local Significant Wetland

ORDINANCE 99-1013
EXHIBIT C

CITY OF OREGON CITY
PUBLIC WORKS STANDARDS
FOR EROSION AND SEDIMENT CONTROL

Adopted by Ordinance #99-1013

Date: October 6, 1999



CHAPTER 1

INTRODUCTION AND DEFINITIONS

The City of Oregon City Public Works Design Standards for Erosion and Sediment Control Drainage Design Standards and Guidelines is included as Exhibit "C" of Ordinance #99-1013.

1.1. PURPOSE

The purpose of this document is to define policies, minimum requirements, minimum standards, and design procedures for erosion prevention and sediment control in Oregon City.

Erosion prevention measures and sediment control practices are required for all development to prevent and restrict the discharge of sediments. Permanent erosion prevention measures are required after development is completed. Erosion prevention techniques shall be designed to protect soil particles from the force of water and wind so that they will not be transported from the site. Sediment control measures shall be designed to capture soil particles after they have become dislodged by erosion and attempt to retain the soil particles on site.

Compliance with these minimum requirements, design and performance standards, and implementation procedures does not relieve the designer, owner, or developer of the responsibility to apply conservative and sound professional judgement to protect the health, safety, and welfare of the general public.

This document is not intended to unreasonably limit any innovative or creative effort which could result in better quality or cost savings. Any proposed departure from this document will be judged on the likelihood that such variance will produce equivalent result, in every way adequate for the user and City residents.

1.2 GOALS

This document is intended to direct development activities to achieve the following goals:

1. To reduce the amount of soil, sediment, and other non-point source pollutants reaching public rights-of-way, stormwater drainage systems, and surface waters;

2. To reduce the amount of airborne dust from development activities;

3. To control water quality degradation from development activities;

4. To prevent or reduce the uncontrolled or irresponsible non-point source pollution discharge to adjoining public or private property;

5. To maintain the integrity and minimize the deterioration of stream channels for their biological functions, as well as for drainage and other beneficial uses;

6. To maintain the integrity and minimize the deterioration of existing culverts, bridges, dams, and other structures;

7. To reduce erosion from development activities through the implementation of Best Management Practices (BMPs);

8. To comply with Oregon City's National Pollution Discharge Elimination System (NPDES) Municipal Separated Sanitary and Storm Sewer (MS-4) permit;

9. To comply with other applicable Oregon State Planning Goals, Federal Clean Water Act, Oregon Department of Environmental Quality (DEQ), Clackamas County, and Metro regulations and existing standards governing water quality management.

1.3 REVISIONS TO THESE STANDARDS

It is anticipated that revisions to these Standards will be made from time to time. The date appearing on the title page is the date of the latest revision. Users should apply the latest published issue to the work contemplated.

1.4 APPLICABILITY

This document shall be applicable as follows:

1. This document applies to development activities that may cause visible or measurable erosion on any property with the City of Oregon City.

2. This document does not apply to work necessary to protect, repair, maintain, or replace existing structures, utility facilities, roadways, driveways, accessory uses, and exterior improvements *in response to emergencies* provided that after the emergency has passed, adverse impacts are mitigated in accordance with applicable standards.

1.5 PENALTIES AND ENFORCEMENT

The City is authorized to make inspections and take such actions as required to enforce the provisions of this document. The City has the authority to enter onto land for the

purpose of inspecting site development activities or related improvements. City staff will make an effort to contact the property owner before entering onto that property.

The City Engineer may require the site owner to: 1) remove any unpermitted or illegal facilities placed, constructed or installed on the site; 2) implement a plan for restoring or stabilizing the site; or 3) correct work that has adversely impacted adjacent or downstream property owners. All costs of such corrective actions shall be borne by the owner.

Any person, firm, or corporation violating any of the provisions of this document, whether they be the property owner, the applicant, the contractor, or any other person acting with or without the authorization of the property owner or applicant, shall be subject to the penalties prescribed in the City of Oregon City Municipal Code.

1.6 HAZARDOUS CONDITIONS

The City Engineer may determine that any excavation, embankment, erosion and sediment control, or drainage facility has become a safety hazard; endangers property; or adversely affects the safety, use, or stability of a public way, critical area, or drainage course. The owner of the subject property and/or the person or agent in control of the property will be required to repair or eliminate the hazard in conformance with the requirements of this document.

At the time that the City Engineer makes the determination that a hazardous condition exists, the property owner and/or person or agent in control of the property will be notified in writing that the hazard exists. The City Engineer will order the specific work to be undertaken or will order that an engineering design be submitted for review and approval by the City Engineer, and will specify the time periods within which the hazardous conditions be repaired or eliminated.

1.7 APPEALS PROCESS

A development engineer or permit applicant shall be allowed to appeal a requirement that is shown in this manual when there is sufficient cause and reason to do so. The appeal shall also be allowed relative to plan review comments provided by City engineering staff. This appeal shall be addressed to the City Engineer in written form on the engineer's or applicant's letterhead and shall describe the details of what is being requested, with references to appropriate sections of this document or the Oregon City Municipal Code.

The City Engineer will meet with the engineer, if necessary, to discuss the issues involved. The City Engineer will provide a verbal discussion at the meeting and the City Engineer will provide a written response to the appeal within 14 calendar days of receiving the appeal. The decision of the City Engineer shall be considered final.

1.8 SEVERABILITY

The provisions of this document are severable. If any part of this document is judged invalid by a court of competent jurisdiction, the decision of that court shall not affect the validity of the remaining portions of this document.

1.9 DEFINITIONS

Unless specifically defined below, words and phrases used in this document shall be interpreted so as to give them the meaning they have in common usage and to give this document its most reasonable application.

Best Management Practices (BMPs) – Activities or structural improvements that help reduce the quantity and improve the quality of stormwater runoff. BMPs include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

City - The City of Oregon City.

City Engineer - The Engineering Manager for the City or his/her authorized representative or the City Manager or his/her authorized representative.

Development - Any manmade change to improved or unimproved real estate, including but not limited to defined as the construction of buildings or other structures, sewers, streets or other structures or facilities, mining, dredging, paving, filling, or grading in amounts greater than ten (10) cubic yards on any lot or excavation. In addition, any other activity that results in the removal of more than 10 percent of the existing vegetation in the Water Quality Resource Area on a lot is defined as development. Development does not include the following: a) Stream enhancement or restoration projects approved by the City; and b) Farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of this Chapter.

Development site - Any lot or lots on any part of which development is taking place.

Disturb - Man-made changes to the existing physical status of the land, which are made in connection with development. The following uses are excluded from the definition:

- enhancement or restoration of the Water Quality Resource Area;
- planting native vegetation, as identified in the Oregon City Native Plant List (as adopted by the Oregon City Commission).

Emergency - Any man-made or natural event or circumstance causing or threatening loss of life, injury to person or property, and includes, but is not limited to, fire, explosion,

flood, severe weather, drought, earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

Engineer - A registered professional engineer licensed by the State of Oregon.

Erosion - The movement of soil particles resulting from actions of water, wind or mechanical means.

Erosion control cover - Means any mulch, straw, hay, chips or other plant residue, vegetation, netting, plastic sheeting or other similar material applied to exposed soil to conserve moisture, prevent erosion, and aid in establishing plant cover.

Excavation - Means any act of development by which soil or rock is cut into, dug, quarried, uncovered, removed, displaced, exposed or relocated.

Fill - Any material such as, but not limited to, sand, gravel, soil, rock or gravel that is placed for the purposes of development or redevelopment.

Manager - Means the City Manager or the City manager's designated representative.

Owner - Means any party, including an owner, part owner or agent that has a legal interest in a piece of real property upon which development is proposed.

Practicable - Means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose.

Sediment - Means any soil, sand, dirt, dust, mud, rock, gravel, refuse or any other organic or inorganic material that is in suspension, is transported, has been moved or is likely to be moved by erosion.

Site Steward – Means individual assigned responsibility and authority for providing effective erosion prevention and sediment control measures at a development site.

Stockpile - Means on-site storage of any soil, sand, dirt, dust, mud, rock, gravel, refuse or any other organic or inorganic material created by development.

Surface water management system - Means all natural and constructed facilities used to regulate the quantity, quality, direction and velocity of surface water, including drainage easement, culverts, storm drains, catch basins, drainage ditches, naturally occurring drainage ways, stream corridors, rivers, ponds, wetland, detention and retention facilities and other impoundments.

Utility facilities - Buildings, structures or any constructed portion of a system which provides for the production, transmission, conveyance, delivery or furnishing of services including, but not limited to, heat, light, water, power, natural gas, sanitary sewer,

stormwater, telephone and cable television. Utility facilities do not include stormwater pre-treatment facilities.

Visible or measurable erosion - Visible or measurable erosion includes, but is not limited to:

a. Deposits of mud, dirt sediment or similar material exceeding one-half cubic foot in volume on public or private streets, adjacent property, or onto the storm and surface water system, either by direct deposit, dropping discharge, or as a result of the action of erosion.
b. Evidence of concentrated flows of water over bare soils; turbid or sediment laden flows; or evidence of on-site erosion such as rivulets on bare soil slopes, where the flow of water is not filtered or captured on the site.
c. Earth slides, mudflows, earth sloughing, or other earth movement that leaves the property.

Wetlands - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands are those areas identified and delineated by a qualified wetland specialist as set forth in the 1987 Corps of Engineers Wetland Delineation Manual.

CHAPTER 2

DISCUSSION - EROSION AND SEDIMENT DEPOSITION, IMPACTS, AND PREVENTION

2.1 OVERVIEW

Each year in Oregon City, sediments are washed from development sites into stormwater systems, ponds, streams, and watercourses. Soil erosion is a source of pollution in surface water draining from watersheds in which development is occurring. This damage to the beneficial uses of our water and natural resources and the consequent cost to the environment and Oregon City taxpayers for cleanup could be largely avoided through the implementation of adequate erosion prevention and sediment control practices.

2.2 EROSION

The likelihood that a given construction area has the potential for serious erosion is largely dependent on several things: on-site soil characteristics, extent and type of vegetative cover, vehicular movement across the site, and site topography.

Soils containing high percentages of fine sands and silts are usually more erodible than soils that have a higher content of clay or organic material. Although clays are more resistant to erosion, they absorb less rainfall and tend to produce more surface runoff, which acts to erode the soil. Once clays have eroded, they are more likely to be carried along in the runoff and are difficult to remove from the surface water. Well-drained and well-graded gravel and gravel-sand mixtures are usually the least erodible soils.

Vegetative cover is very important in preventing erosion by 1) shielding the soil surface from the impact of falling rain, 2) holding the soil particles in place, 3) maintaining the soil's capacity to absorb water, and 4) slowing the flow of runoff over the ground.

The extent of erosion and the time during which erosion can take place is reduced by: 1) minimizing the size of the areas to be cleared; and 2) staging vegetation removal relative to precipitation and associated runoff. Soil erosion and the resulting sedimentation can be significantly reduced by establishing temporary and permanent vegetative cover for disturbed areas.

The simple movement of traffic on and off the site can cause considerable erosion. Once soil is tracked onto roads, the potential increases for non-point source pollution entering stormwater systems, streams, wetlands, and other surface water facilities.

The size and topography of the watershed in which development occurs influences the amount and rate of runoff through the site. If the site is downstream of a large watershed, or if the site itself is sizable, the potential exists for a considerable amount of runoff to be

flowing through the site during a storm. If the site has steep slopes, the velocity of the runoff will be greater, resulting in a higher potential for erosion.

The site's orientation can also be a factor. If the site faces to the north away from the sun (or if the site has poor soils for growing plants), it may be very difficult to establish a permanent vegetative cover following construction. For this reason, it is important to take into consideration the natural development of existing vegetation on a site prior to clearing. Hydro-seeding a site is no guarantee that plant life will become re-established to the extent that erosion protection can take place without costly maintenance and periodic replanting.

2.3 SEDIMENT DEPOSITION

Sediments are carried in surface water. Sediments are eventually deposited after the water has slowed enough for the particles to settle out. Excessive amounts of sediment are generated by erosion during major storm events. Some erosion and sedimentation occurs during all storm events. Sediment is often carried farther downstream with each peak storm event, being picked up from where it was deposited during the previous peak storm. For this reason, it is important to bear in mind that the facilities that are placed on a site to collect sediment (silt fencing, ponds, etc.) are going to be primary sources of sediment in later storms.

2.4 IMPACTS OF EROSION AND SEDIMENT DEPOSITION

Erosion and sediment deposition can cause both economic and environmental impacts:

1. Economic Impacts:
    a. Sediment fills channels and ponds, resulting in the need for more frequent sediment removal and also the increased likelihood of damage to property from flooding.
    b. Cost of topsoil restoration to promote plant growth.
    c. Cost of restoring eroded slopes, channels and roads.
    d. Cost to clean storm sewers, catch basins and other drainage facilities.
    e. Cost to restore beneficial uses of downstream channels, lakes, streams and wetlands.
2. Environmental Impacts
    a. Eroded soil contains nutrients that can trigger algae growth, which reduces water clarity, depletes oxygen, and leads to fish kills.

b. Erosion of stream banks and adjacent areas destroys vegetation that provides aquatic and wildlife habitat as well as the shade to reduce water temperature.

c. Excessive sediment deposits in streams blanket the bottom, destroying fish spawning areas.

d. Erosion removes the fines from topsoil, reducing its ability to support plant growth.

e. Sediment physically damages fish by abrasion and clogging their gills.

2.5 EROSION PREVENTION AND SEDIMENT CONTROL

The best approach to erosion control is to prevent erosion through on-site measures. Once highly eroded, fine-grained soils are in stormwater, they are not easily removed by small, passive-type treatment systems, such as hay bales and silt fences.

The City requires that stormwater discharge points be armored with sediment barriers to minimize off-site migration. These barriers shall be maintained throughout the period of substantial construction activity in the tributary watershed of the stormwater discharge points. These barriers shall be removed using proper abandonment techniques upon substantial completion of construction and upon City approval. Performance standards for downstream turbidity shall be met as barriers and collected sediments are removed.

Techniques to achieve erosion prevention and sedimentation control are presented in Appendix A, Best Management Practices for Erosion Prevention and Sediment Control, a reference from the City of Portland's July 6, 1999 Draft Revised Erosion Control Manual.

2.6 NPDES

The Environmental Protection Agency (EPA) adopted regulations requiring National Pollutant Discharge Elimination System (NPDES) permits for stormwater discharges. The Oregon Department of Environmental Quality (DEQ) is responsible for administering the stormwater program. Since the regulations are complex, contact DEQ for specific information.

Certain industries and construction sites must have discharge permits. DEQ administers NPDES 1200C permits for construction activities that will likely disturb designated sites based on size. EPA regulates what size sites require an NPDES 1200C permit. Oregon City must have a copy of your permit on file, or a notice from DEQ that none is required, prior to approval of construction plans.

For all NPDES permits, the applicant may be any party that is responsible for assuring that the items covered by the permit are implemented and maintained. Enforcement action, if required, is against this applicant (usually the owner). The permit will require

the development of an Erosion and Sediment Control plan. This plan must be approved and implemented prior to beginning any construction activities. This DEQ/NPDES plan may serve as the basis for the Oregon City-required erosion control plan.

The City is a co-permittee with Clackamas County on an NPDES Municipal Separated Sanitary and Storm System (MS4) permit and monitors City streams, surface water, and stormwater conveyance systems for pollution. The City will take appropriate action to prevent soil erosion and maintain stormwater and stream quality.

CHAPTER 3

EROSION AND SEDIMENT CONTROL PERMITS

3.1 EROSION AND SEDIMENT CONTROL PERMITS

An Erosion and Sediment Control permit is required prior to or contemporaneous with approval of development that may cause visible or measurable erosion. The permit will be issued by the Oregon City Community Development Department upon approval of the Erosion and Sediment Control Plan for the project.

3.2 PERMIT FEE

A fee will be charged to obtain an Erosion and Sediment Control permit from the city. The fee will cover review of Erosion and Sediment Control plans and site inspection for compliance.

3.3 EROSION CONTROL CERTIFICATION

Developers and contractors of development activities requiring erosion control permits who have a certified individual on staff with authority over erosion control and who is responsible for erosion control of the site (site steward) are eligible for a discount of erosion control fees.

Certification shall involve training in erosion and sediment control techniques, issues, and implementation strategies. A minimum of four hours of classroom instruction shall be required every two years.

3.4 PERMITS FROM OTHER JURISDICTIONS

The Oregon State Department of Environmental Quality (DEQ) will issue NPDES 1200C permits for projects. No construction permit will be issued for projects requiring the 1200C permit without a copy of that permit being on file with Oregon City. DEQ is responsible for enforcing its own permits, however, if City personnel observe conditions that are believed to be in violation of any such permit, and cannot get corrections made, it will bring such conditions to the attention of the appropriate DEQ representatives.

Projects often require Oregon State Division of State Lands (DSL) and/or United States Army Corps of Engineers (COE) permits. No construction permit will be issued for projects requiring these permits without a copy of that permit being on file with Oregon City. DSL/COE is responsible for enforcing its own permits, however, if City personnel observe conditions that are believed to be in violation of any such permit, and cannot get

corrections made, it will bring such conditions to the attention of the appropriate DSL/COE representatives.

Occasionally, projects may require Oregon State Department of Fish and Wildlife (ODFW) permits. Again, no work will be authorized until the receipt of a copy of the permit. ODFW is responsible for enforcing it's own permits, however if City personnel observe conditions that are believed to be in violation of any such permit, and cannot get corrections made, the City will bring such conditions to the attention of the appropriate ODFW representatives.

CHAPTER 4

EROSION AND SEDIMENT CONTROL PERMITS AND PLANS

4.1 EROSION AND SEDIMENT CONTROL PLAN

The goal of the Erosion and Sediment Control Plan is to:

1. Prevent erosion by employing practices such as non-disturbance, construction schedules, erosion blankets and mulch covers; or

2. Ensure that where erosion cannot be completely avoided, the sediment control measures will be adequate to prevent sediment from entering public rights-of-way, the stormwater system, surface waters, and Water Quality Resource Areas; and

3. To address foreseeable conditions that may result during the development activity and provide for appropriate measures to ensure that minimum performance standards are met under all weather conditions.

4. Show that the permit applicant will actively manage and maintain erosion prevention and sediment control measures and utilize techniques to prevent or control erosion during and following development.

Specific Erosion and Sedimentation Control Plan submittal requirements are presented in Section 4.4.

4.2 DESIGN STANDARDS

Erosion and Sediment Control plans shall comply with the following standards:

1. Erosion and Sediment Control Measures: The following specific methods of soil erosion prevention and sediment control shall be used during construction to prevent visible and measurable erosion. Associated best management practices shall be consistent with those in Appendix A.

   a. All land area proposed for excavation, vegetation removal, soil stockpiling or which will have exposed soil shall be considered part of the development site.

   b. The duration of soil exposure shall be kept to a minimum. Exposed soils shall be treated with an erosion control cover following grading or construction until soils are revegetated or otherwise stabilized. All disturbed soil that remains exposed for 21 consecutive days or more during construction shall be treated with an erosion control cover.

c. Between October 1st and May 30th, all bare soil shall be re-seeded, covered with an appropriate erosion control blanket, and fertilized. Where rapid germination is required, use the grass seed mixes as recommended in Appendix A (Section 3.15).

d. During construction, runoff from the development site shall be controlled, and runoff and sediment resulting therefrom shall be retained on-site. Temporary diversions, sediment basins, barriers, check dams, channels and dikes, or other similar methods shall be employed as necessary to hold sediment and control runoff from the development site.

e. There shall be no tracking of dirt on roads bordering a development site; there shall not be any mud balls, or load drippings, deposited on the roads; and the waters running from the site shall run clear. These minimum performance standards shall occur under ALL weather conditions.

f. Dewatering operations shall include erosion and sediment control measures that filter the discharge water and properly collect sediments from the discharge water so that minimum performance standards (see Chapter 5) are met.

g. Cleaning sediments from holding areas shall be performed in a responsible manner so that turbidity performance standards are not exceeded.

h. A stabilized pad of gravel shall be laid and maintained at all entrances and exits to any development site from which vehicular traffic may track soil or debris onto the public right-of-way. The gravel pad(s) shall be installed and inspected prior to any other development or site preparation. No other vehicular entrance or exit may be used to access the development site.

i. Additional gravel may have to be added periodically to maintain proper function of the entrance pad. If the gravel pad does not adequately remove dirt and mud from vehicle wheels such that mud and dirt tracking is evident off-site, cleanup measures must be taken, such as dry-sweeping and vacuuming the street. Additional prevention measures must be implemented and may include hosing off wheels before vehicles leave the site or other construction techniques/work operations modifications. Wheel washing should be done on the gravel pad and wash water shall drain through a silt-trapping structure prior to leaving the construction site.

j. Vehicle and construction equipment wash-down areas shall be located near all vehicle access points within the development site and shall be illustrated on the plan.

k. Topsoil removed for development shall be stockpiled and reused to the degree necessary to restore disturbed areas to their original or enhanced condition, or to assure a minimum of six inches of stable topsoil for revegetation. Additional soil

shall be provided if necessary to support revegetation. Soil shall be stockpiled so as to not affect existing on-site tree health.

l. The owner or his/her designated representative shall be responsible for the prompt clean-up of all sediments that are carried onto any public or private streets or onto adjacent property as soon as the owner becomes aware of such problems or within the time required by the City in its notice to the owner. The owner or his/her designated representative shall be responsible for cleaning and repairing streets, catch basins, drainage ways, storm water drainage facilities and adjacent properties contaminated or damaged by sediment.

2. Vegetation Restoration. Where vegetation has been removed, the owner or his/her designated representative shall be responsible for revegetating public and private open spaces, utility easements, and undeveloped rights-of-way in accordance with the implementation schedule and consistent with the following standards:

   a. Temporary measures shall be used and maintained until permanent facilities are installed and functional.

   b. Work areas on the development site shall be carefully identified and marked to reduce the potential for accidental damage to trees and vegetation and to avoid soil compaction above the root zone of trees. Tree and vegetation areas shall be fenced off.

   c. Trees not scheduled for removal shall not be used as anchors for stabilizing work equipment or for the placement of signs.

   d. During clearing operations, any property upon which trees and vegetation are placed or allowed to fall shall be deemed to be part of the development site.

   e. In areas designated for selective cutting or clearing, care in falling and removing trees and brush shall be taken to avoid injury to trees and shrubs to be left in place.

   f. Soil, or soil mixed with vegetation, shall not be stockpiled at the development site after inspection and final acceptance of the development by the city.

   g. The owner or his/her designated representative shall be responsible for the seeded areas until vegetation upon them is established. Any additional seeding necessary to establish the vegetation shall be done by the owner or his/her designated representative.

3. Dust Control. Dust control measures shall be included in the plan. Such dust control measures may include, but are not limited to, the following:

   a. Sprinkling access and haul roads and other exposed roadways and dust-producing areas with water;

   b. Applying dust palliatives to access and haul roads;

c. Establishing temporary vegetative cover;

d. Placing wood chips, gravel or other effective erosion control cover on vehicle and pedestrian use areas, maintaining the proper moisture condition on all fill surfaces;

e. Pre-wetting cut and fill surface areas; and

f. Covering the loads in haul equipment.

4. Storage. All erodible materials delivered to a development site shall be covered and protected from the elements in a manner sufficient to prevent erosion of the materials in violation of this chapter and at a minimum shall be subject to the following:

   a. Erodible materials shall not be exposed to the weather during storage;

   b. Waste material, rinsing fluids and other similar material shall be disposed of in such a manner that pollution of groundwater, surface water or air does not occur;

   c. No toxic materials shall be disposed of on site, but shall be stored, handled, transported and disposed of according to state and federal requirements.

5. Additional Standards. If the performance standards of Section 5.3 are not met, the owner or his/her designated representative shall implement additional erosion and sediment control measures to achieve performance standards. Such measures shall be consistent with the Best Management Practices presented in Appendix A. In these instances, the owner or his/her designated representative shall obtain all necessary DEQ permits for water pollution control facilities, wetland impacts and fills required for compliance with this chapter and supply copies of such permits to the City.

4.3 EROSION AND SEDIMENT CONTROL PLAN IMPLEMENTATION

The owner or his/her designated representative shall implement the measures and construct facilities as provided for and according to the implementation schedule in the approved plan. The City Engineer shall be allowed reasonable access to the development site for inspection purposes.

1. The owner or his/her designated representative is solely responsible for protection of all work, adjacent properties and downstream facilities from erosion and sediment deposition during the course of the work.. Any damage resulting from such erosion and sediment deposition shall be corrected.

2. Erosion control measures are only temporary. They shall be installed, repaired, modified, or replaced at the direction of the City Engineer. The boundaries of the clearing limits shown on the grading plan shall be clearly flagged in the field prior to construction. During the construction period, no disturbance beyond the flagged clearing limits shall be permitted. The owner or his/her designated representative shall maintain the flagging for the duration of the clearing activities.

3. The erosion and sediment control facilities shall be inspected, as required and after each storm occurrence, by the owner or his/her designated representative and maintained as necessary to ensure their continued functioning.
4. The erosion and sediment control facilities on inactive sites shall be inspected and maintained a minimum of once a month, or within 48 hours following a storm event.
5. At no time shall more than one foot of sediment be allowed to accumulate within a trapped or sump catch basin. All catch basins and conveyance lines shall be cleaned prior to paving. The cleaning operation shall not flush sediment-laden water into the downstream system.

4.4 STANDARD EROSION AND SEDIMENT CONTROL PLANS - SUBMITTAL REQUIREMENTS

Standard Erosion and Sedimentation Control (ESC) Plans shall be prepared by and be stamped with the seal of, and signed by, either a Professional Engineer or a Landscape Architect, or both, registered in the State of Oregon. The Erosion and Sedimentation Control Plan shall include at least the following information:

1. The plan view shall be no smaller than 1"=100' scale. Recommended scale is 1"=50'.
2. If a plan covers any area in an existing or proposed public right of way, then the plan sheet size shall be 24-inch x 36-inch. Although a 24-inch x 36-inch sheet size is preferred, the maximum plan sheet size for a proposed privately owned stormwater facility shall be 30-inch x 42-inch.
3. The name, address, phone number, fax number, and e-mail address (if available) of the site steward responsible for erosion control at the project site throughout project duration (that is site clearing and grubbing through permanent vegetation establishment).
4. The name, address and 24-hour contact number(s) of the designated emergency contact person.
5. Existing topography, as per the requirements for Engineered Drainage Plan listed in Section 2.3
6. Soil types, together with the location of any soil test pits or infiltration test sites.
7. Clearing and grubbing limits.
8. Finished grade.
9. Locations of all existing and proposed channels, swales, or drainage pipes which either convey offsite stormwater through, or route stormwater around, the construction area. Identify the nearest receiving stream.
10. Locations of all proposed erosion and sedimentation control facilities.
11. Details of all proposed erosion and sedimentation control facilities.

12. Phasing of any erosion and sedimentation control work clearly indicated on the plan.
13. Methods of filtering discharge and controlling sediment from dewatering operations.
14. When sedimentation ponds are proposed, at least one cross section detail shall be shown.
15. Details and notes for mulching and revegetation. Also include detailed planting procedures, topsoil requirements, seed/plant specifications, and plant maintenance specifications.
16. The name, address, and telephone number of the project owner.
17. The name, address, license number, and telephone number of the Project Engineer and/or Project Landscape Architect (who prepared the plan).
18. A detailed listing of the construction sequences, when necessary to define the work.
19. Stormwater discharge points clearly identified with City-approved sediment barriers/traps and maintenance procedures detailed from all project's phases. Subdivisions shall not connect stormwater piping to an off-site system without an effective sediment barrier/trap. Sediment barrier/trap shall remain functional until the final building permit receives final inspection for occupancy and landscaping is substantially complete on 80 percent of the lots within stormwater system's drainage area. Concurrence with the City Engineer is required before abandoning of the sediment barrier/trap function.
21. Two sets of plans shall be submitted for plan reviews. Six sets of plans shall be submitted for final approvals. For final approvals, one plan set shall bear a wet ink signature of the Professional Engineer or a Landscape Architect who prepared the plan. License may not be necessary for ECSP
22. Location of on-site sign posted so that it is visible and readable from the public right-of-way near the main property access. This sign will identify the following project information:

    a. Oregon City permit number or identification.

    b. Name and telephone number of the permit holder.

    c. Name, telephone number, fax number, and e-mail address, if available, of site steward responsible for the erosion control.

4.5 ABBREVIATED EROSION AND SEDIMENT CONTROL PLANS - SUBMITTAL REQUIREMENTS

Abbreviated Erosion and Sediment Control plans may be prepared for the development of a singular, single residential lot of ½ acre (21,780 square feet) and smaller with a valid,

City-issued building permit. This abbreviated erosion control plan is required whenever the issuance of the building permit will result in the creation of more than 1000 feet on impervious area or if the building permit activity will disturb more than 10 percent of the existing vegetation in a Water Quality Resource Area. An Abbreviated Erosion and Sedimentation Control Plan shall include at least the following information:

1. The plan view shall be no smaller than 1" = 50' scale.

2. Building permit number and the name, address and phone number of the person or party to whom the permit is issued.

3. The name, address, phone number, fax number, e-mail address (if available) of the site steward responsible for erosion control at the project site throughout project duration (that is site clearing and grubbing through permanent vegetation establishment).

4. Locations or descriptions of all proposed erosion and sedimentation control facilities.

5. Details of all proposed erosion and sedimentation control facilities.

6. Details and notes for mulching and revegetation.

7. Location of on-site sign that shall be posted at all times so that it is visible and readable from the public right of way near the main property access. This sign will identify the following project information:

   a. Building permit number.

   b. Name and telephone number of the building permit holder.

   c. Name, telephone number, fax number of the site steward responsible for the erosion control.

   This information can be printed on an 8½" x 11" sheet of paper that is placed in a water-resistant plastic covering.

8. The following notes shall be shown on the Abbreviated Erosion and Sedimentation Control Plan

   a. Materials tracked into street shall be cleaned up prior to the close of the workday by means of dry sweeping (e.g., with broom or shovel). Materials shall not be washed down the road into the storm system or water bodies.

   b. The following will result in an enforcement action by the City:

      1. Any observation of visible or measurable erosion resulting in off-site sediment transport.

      2. Failure to maintain the project information in readable condition.

c. Method of protecting nearest downstream catch basin, including maintenance of protection method.

CHAPTER 5

RESPONSIBILITIES, PERFORMANCE STANDARDS, AND ENFORCEMENT

5.1 PURPOSE

Generally, it is easier to prevent an action than to recover from a mistaken action. Therefore, it is the intent of City's municipal code to keep all soils on a development site. If evidence is reported or observed of sediment being transported off site by any means other than by a hauling (trucking, where the soil is carried in the bed of the truck), the job shall be shut down until effective corrective measures are in place and compliance is verified and approved by the City. This section applies whether or not the activity has been permitted by the city.

5.2 RESPONSIBILITIES WITH RESPECT TO PERFORMANCE STANDARDS

It will be the responsibility of the site steward to ensure that persons performing the land disturbing activity implement the Erosion and Sediment Control plan. The Erosion and Sediment Control plan shall endeavor to address all activities and/or phasing. It may not be possible for Erosion and Sedimentation Control Plans to address every possible activity that may occur, and it will be the site steward's responsibility to ensure the persons performing the land disturbing activity achieve the performance requirements for any activity not addressed on the plans. Any additional requirements that are necessary to achieve the performance standards shall be communicated by revising the Erosion and Sediment Control plan.

5.3 PERFORMANCE STANDARDS

Erosion prevention and sediment control in Oregon City will:

- Prevent erosion by implementing prevention practices such as non-disturbance; construction schedules, or temporary or permanent landscaping, erosion blankets, mulching covers, or equivalent; or

- Control sediment transport to prevent sediments from entering the public rights-of-way, stormwater drainage systems, surface waters, and Water Quality Resource Areas.

Erosion prevention and sediment control shall be measured using the following performance standards:

1. No visible or measurable erosion – Visible or measurable erosion includes, but is not limited to:
    a. Deposits of mud, dirt sediment or similar material exceeding one-half cubic foot in volume on public or private street, adjacent property, or into the storm and surface water management system, either by direct deposit, dropping discharge, or as result of the action of erosion.
    b. Evidence of concentrated flows of water over bare soils; turbid or sediment laden flows; or evidence of on-site erosion such as rivulets of bare soil slopes, where the flow of water is not filtered or captured on the site.
    c. Earth slides, mudflows, earth sloughing, or other earth movement that leaves the property.
2. No more than a ten percent cumulative increase in channel turbidities (natural or constructed channel), as measured relative to a control point immediately upstream of the turbidity-causing activity. Where the stormwater runoff from the turbidity-causing activity is served by a piped storm drain system to a discharge point into a channel, the control points of measurement shall be upstream of and down stream of the pipe's discharge point. However, limited duration activities necessary to address emergency or to accommodate essential construction or other legitimate activities and which cause the standard to be exceeded may be authorized by the permitting authority provided all practicable BMPs have been applied. This authorization shall be obtained in advance from the permitting authority.

5.4 ENFORCEMENT OF PERFORMANCE STANDARDS

The City will investigate any reports of visible or measurable erosion or increases in channel turbidities. The City will also conduct periodic inspections of land disturbing activity to ensure that the performance standards are being achieved. These inspections may be conducted on any day of the week at any time of the day.

In the event that the performance standards are not being achieved, the City will take the following actions:

1. Notice of Non-Compliance. The site steward will be advised of non-compliance with the City's erosion control ordinance and given 24 hours to implement effective erosion and sediment control measures.

2. Issue a Stop Work Order. Only work directly related to erosion and sediment control will be allowed. The stop work order will remain in effect until the mitigation measures are implemented that comply with Oregon City performance standards for erosion ontrol

3. Code Violation Citation. In the event that corrective action is not taken within the time period specified on the stop work order, a code violation citation will be issued to the permittee and/or the contractor or persons responsible for carrying out the development work. For each issued citation, or day of violation, a civil penalty will be assessed per the City code.

5.5 EXEMPTIONS FROM PERFORMANCE STANDARDS

There are no exemptions from the performance standards.

5.6 INSPECTION AND ENFORCEMENT PERIOD

The inspections (with the implied enforcement potential) will be conducted from the start of work and will continue until all exposed soil is covered with vegetation, or other permanent cover. The permanent cover will have achieved the performance standards presented in this document. The City Engineer will have the discretion to determine whether the permanent cover is adequate.

APPENDIX A

Erosion Prevention and Sediment Control
Best Management Practices

Source: City or Portland July 6, 1999, Draft Revised Erosion Control Manual, Section 3

APPENDIX A
Erosion Prevention and Sediment Control
Best Management Practices

Site Entry BMP's

3.1 Gravel Construction Entrances

Purpose

To reduce the amount of mud, dirt, rocks, etc., transported onto roads by motor vehicles or storm water runoff by constructing a stabilized pad of gravel at entrances/exits to construction sites.

Conditions Where Practice Applies

At any construction site where traffic will be leaving the site and moving directly onto public roads, other paved areas, or other approved access points.

Design Criteria/Specifications

A. A gravel construction entrance should be the first site BMP installed after clearing.

B. Material should be clean pit run or ¾-inch-minus gravel (or larger, as needed).

C. The gravel pad shall be at least 8 inches thick and 40 feet in length. Width shall be the full width of the vehicle ingress and egress area. (A 20-foot minimum pad length may be acceptable as approved for single family and duplex residential construction sites.) See Site Entry BMP Drawing 3-1.

D. Use subgrade reinforcement geotextile under gravel pads for all but construction of a single family/duplex residence on existing lots of record.

Additional Measures

A. An additional measure is to construct gravel filter berms across on-site traffic wheel paths to capture and retain sediment. Berms shall be 1-foot high with 3:1 side slopes, constructed of ¾- to 3-inch crushed rock with less than 5 percent fines. Berms must be inspected regularly and accumulated sediment removed with rock added or replaced as needed. Berms should be spaced as follows:

- every 300 feet on slopes less than 5 percent,
- every 200 feet on slopes between 5 and 10 percent,
- every 100 feet on slopes greater than 10 percent.

B. If the gravel pad does not adequately remove dirt and mud from vehicle wheels such that mud and dirt tracking is evident off site, additional measures must be taken. Such measures may include washing off wheels before vehicles leave the site or other construction techniques/work operation modifications. Wheel washing should be done on the gravel pad or in an approved wheel wash structure located on-site, adjacent to and on the site interior side of the gravel pad.

C. Wheel wash structures shall be established on a relatively flat grade (1%) with a minimum 50-foot run out area after the wash. The wash itself shall be 18 inches deep with a constant minimum 12-inch-deep water pool – maintain depth at all times. Wheel washes shall be constructed as shown in the detail drawing (a layer of filter fabric covered by 12 inches of compacted, crushed rock, and then covered by 12 feet of reinforced concrete - #5 rebar at 12 inches on center, both directions) or as designed by a licensed engineer. Wash water shall be drained through a silt-trapping structure prior to leaving the construction site. See Detail Drawing 3-1B for details of a typical wheel wash structure.

Maintenance/Removal Guidance

Additional gravel may need to be added periodically to maintain proper function of the pad. Replace gravel when the subsurface becomes plugged with soil and becomes ineffective, or when surface voids in the gravel are visible. At a minimum, wheel washes shall be cleaned when accumulated sediment is over 4 inches deep. Once construction activities have ceased and construction vehicles no longer enter the area, the pad and wash may be removed and the area reestablished.

Primary Purpose

- To contain sediments on-site.
- To provide access without the use of gravel ramp.
- To prevent vehicles from tracking dirt onto improved roadways.

SHALL NOT be used:

- When paved on-site access is available.
- Across streams and other drainage channels.

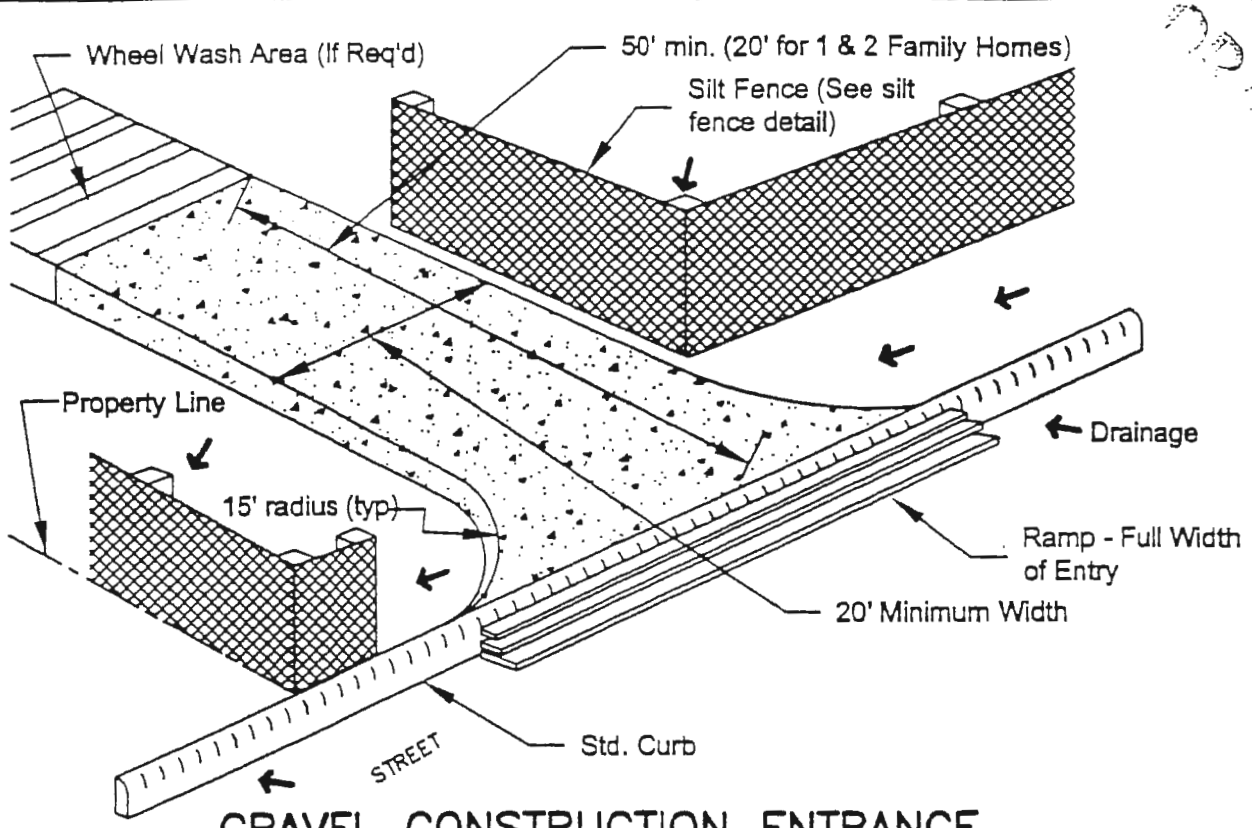
Installation Tips

- Implement as first site BMP.
- Evacuate to finish drive subgrade so that fabric and gravel may remain permanently in place. Remove contaminated material adequate to pave driveway.

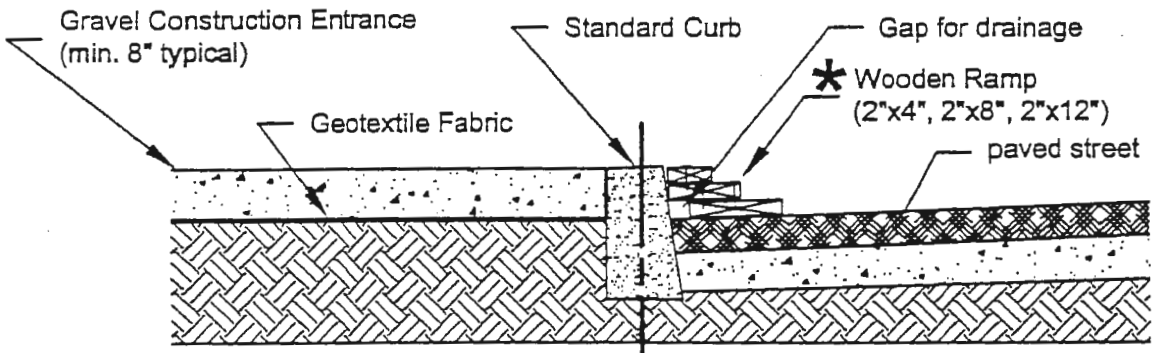
- Locate entry on upslope side of lot if possible to avoid concentrating and diverting runoff into the street.
- Consider use of multiple entries to access large or difficult sites.
- Add a wheel wash area as required (see text page x).

Signs of Failure

Signs of Failure	Cause	Solution
Tracking mud into the street	▪ Gravels are contaminated or insufficient ▪ Lack of proper maintenance	▪ Add additional gravel ▪ Add a wheel wash facility
Dust generation	▪ Lack of moisture on site roads ▪ Friable soils on-site	▪ Add additional gravel or lengthen drive. ▪ Use a water truck to keep dust down. Control amount and type of spray to minimize erosion. ▪ Use a wetting agent on roadways.



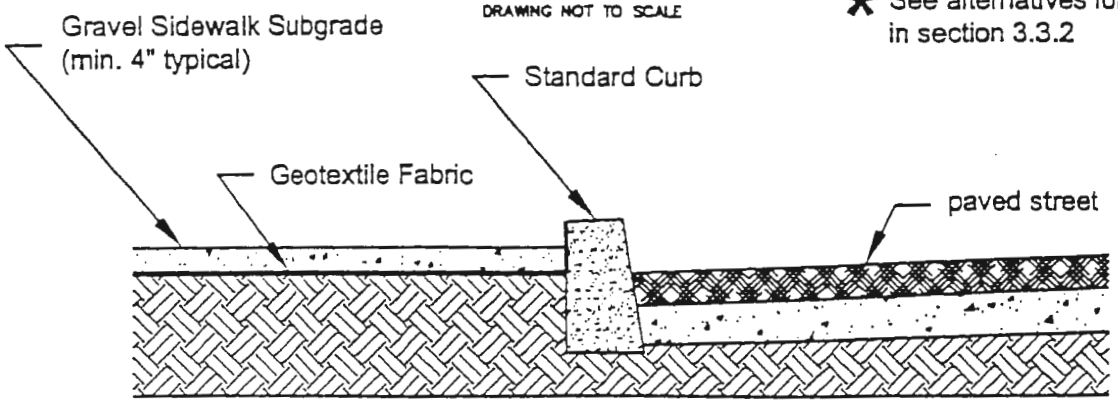
GRAVEL CONSTRUCTION ENTRANCE



CONSTRUCTION ENTRANCE ⟷ WOODEN CURB RAMP

DRAWING NOT TO SCALE

* See alternatives for wood ramp in section 3.3.2



SIDEWALK SUB-GRADE

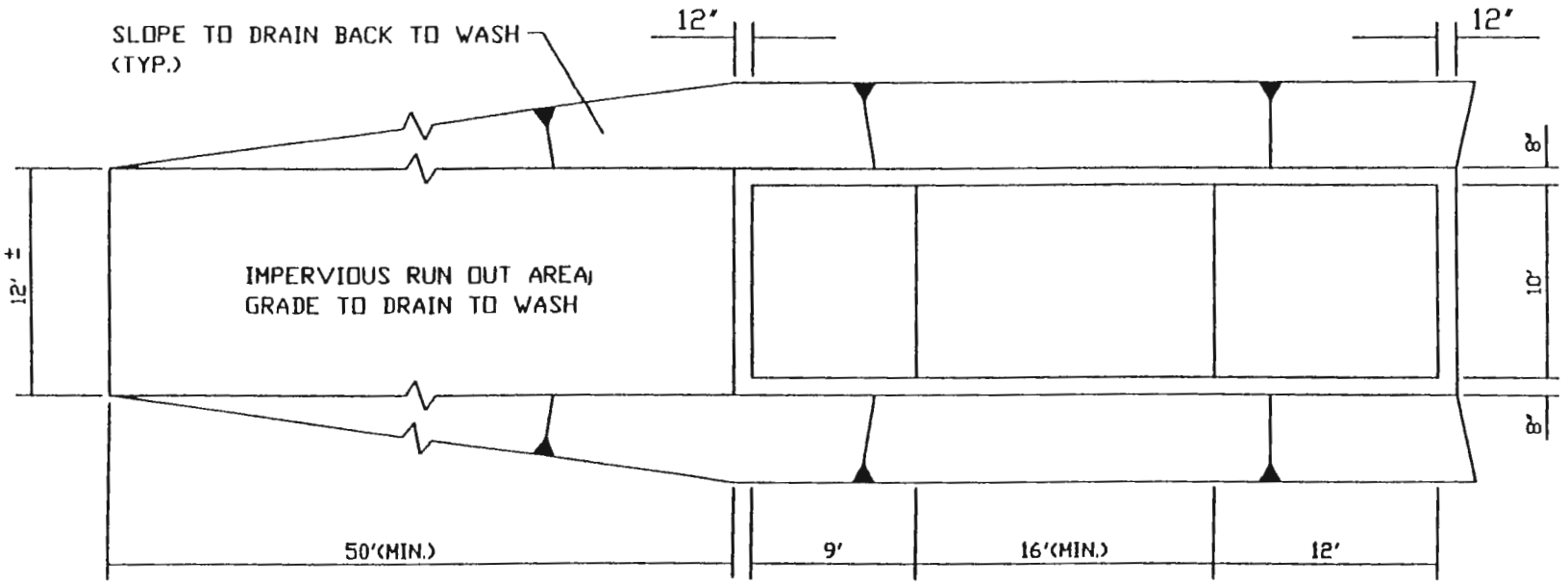
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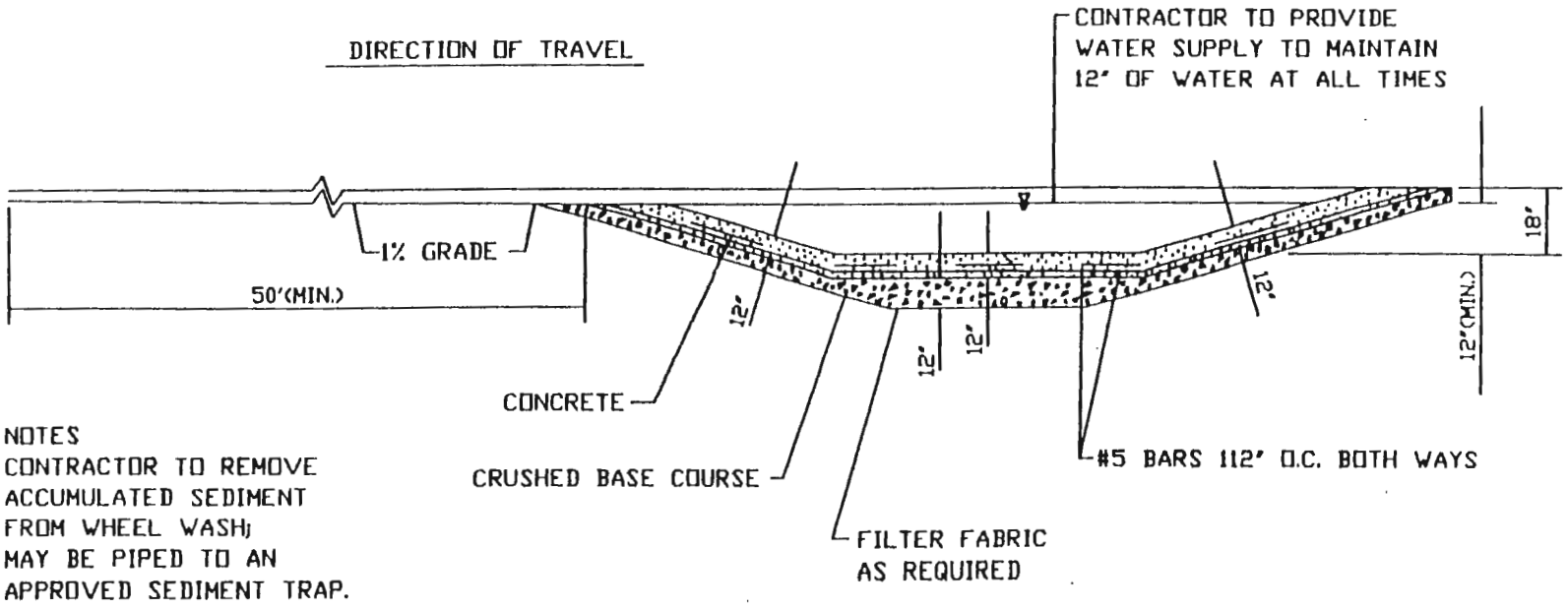
TECHNICAL GUIDANCE HANDBOOK	GRAVEL CONSTRUCTION ENTRANCE Detail Drawing 3.1

FILE DRAFT:INSPECTORS GRAPHICS DRAWING DR 3.21 PLOT 1:1

WHEEL WASH

Detail Drawing 7.10





NOTES
CONTRACTOR TO REMOVE
ACCUMULATED SEDIMENT
FROM WHEEL WASH;
MAY BE PIPED TO AN
APPROVED SEDIMENT TRAP.

3.2 Wooden Curb Ramp

Purpose

To provide ramp access to stabilized construction entrance without blocking flow or adding sediment to curb runoff.

Conditions Where Practice Applies

A. Any area needing access from a paved surface to a gravel site entrance.

Design Criteria/Specifications

A. No gravel or road base allowed.

B. A wooden ramp shall be built from three or more planks of increasing size wood, offset to allow for drainage.

C. Materials shall be untreated wood of 2x4 to 4x12 dimensions and shall be attached using nails, screws, adhesive or other approved fastening system.

D. A minimum 2-inch gap for drainage shall be cut or left in the offset stack adjacent to the curb.

E. Larger, long-term projects may use hot mix asphalt ramps that will be removed when a permanent drive is installed. Cold asphalt is not allowed because of its durability. Asphalt shall be poured for a minimum 2–foot gradual slope between curb and street level and have sanded connection joints.

Maintenance/Removal Guidance

A. Remove sediment and other debris when it begins to accumulate behind or upslope from the ramp.

B. Inspect frequently to assure nails, screws or adhesives are in good working order. Replace any wood pieces that become cracked or damaged where they can no longer provide structural support.

C. Remove wooden ramp after construction has ceased or when a permanent driveway has been installed.

3.3 Sidewalk Subgrade Barrier

Purpose

To reduce the transport of sediment from a construction site by using the sidewalk subgrade gravel as a temporary trap for sediment-laden runoff.

Conditions Where Practice Applies

Single family/duplex residential construction sites, where the site slopes to a street with planned but unconstructed sidewalks and site slopes are less than 5 percent..

Design Criteria/Specifications

A. See Detail 3-1 for specifications.

B. Excavate a minimum of 8 inches behind existing curbing. Line with a geotextile fabric. Backfill with a minimum of 4 inches of gravel, leaving a 4-inch capture depth behind the curb.

C. Sidewalk subgrade gravel must be in-place during the entire construction period, from the time of initial site clearing/grading through establishment of permanent site cover. If the sidewalk concrete is to be poured prior to establishment of permanent site cover, approved sediment barriers must be installed prior to pouring concrete.

Maintenance/Removal Guidance

A. Remove sediment when it accumulates within 2 inches of the top of the curbing. Replace gravel when surface voids in gravel are visible.

B. If the sidewalk subgrade gravel does not provide an effective filter and sediment is leaving the construction site, additional measures must be applied. These may include replacement of gravel or installation of sediment barriers.

C. Subgrade gravel may not meet the local jurisdiction's specifications for sidewalk concrete placement if too much sediment has infiltrated the rock. The permittee must therefore weigh the benefits of eliminating sediment barriers versus the possibility that the subgrade gravel may be rejected by the local jurisdictions.

Primary Purpose

- To contain sediments on-site.

SHALL NOT be used:

- By itself on slopes >5%.
- In areas of high runoff volume.

Installation Tips

- Evacuate to finish drive subgrade so that fabric and gravel may remain permanently in place. Remove contaminated material adequate to pave driveway.
- Use with silt fence at the back of the curb or at the property line.
- Use mulch or gravel behind the curb.
- For cross slopes >5%, add winged sections to the silt fence behind the curb.
- Add winged silt fence sections at property corners.

Signs of Failure

Sign of Failure	Cause	Solution
Silt in Road	▪ Silt has overtopped silt fence. ▪ Lack of proper maintenance. ▪ Concentrated storm water flow from above subgrade area.	▪ Remove silt buildup. ▪ Mulch or prevent erosion from contributing areas. ▪ Pipe away concentrated flows. ▪ Use a spreader to disperse concentrated flows evenly across site.

3.4 Temporary Sediment Control (Silt) Fences

Purpose

To reduce the transport of sediment from a construction site by providing a temporary physical barrier to sediment and reducing runoff velocities.

Conditions Where Practice Applies

A. Down slope of disturbed areas where runoff occurs as sheet runoff.

B. At the toe of soil stockpiles.

C. At intervals as indicated on Table 3-x along the contours of large disturbed areas.

D. At grade breaks exceeding 20% up to 50% only (see matrices).

E. Sediment fences shall not be installed across streams.

Silt fences are most effective for trapping granular/coarse materials and should not be relied on to reduce turbidity.

Design Criteria/Specifications

A. See Detail 3-4 for details.

B. A trench shall be cut along slope contours and around stockpiles for sediment fence installation. Filter fabric fence shall have a minimum vertical burial of 6 inches. All excavated material from filter fence installation shall be firmly redeposited along the entire trenched area on the uphill side of and against the fence.

C. Standard or heavy-duty filter fabric fence shall have manufactured stitched loops for 2"x 2" post installation. Stitched loops shall be installed on the uphill side of the sloped area, with posts spaced a maximum of 6 feet apart.

D. Where practical, the filter fabric shall be purchased in a continuous roll to the length of the barrier to avoid use of joints. When joints are necessary, 2"x2" posts shall be interlocked with each other and be attached securely together.

E. Maximum sheet or overland flow path length to sediment fence as shown in Table 3-x. Ends of fence lines shall be angled upslope in an arcing fashion. Wings may need to be added for long lines running downslope to allow for slowing of surface flows.

F. The physical integrity of all materials shall be sufficient to meet the requirements of their intended use and withstand normal wear and tear. Selection of filter fabric

tensile and bursting strength depends on the slope characteristics. The use of standard or heavy-duty filter fabric shall meet design standards. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 degrees F to 120 degrees F. Selection shall be based on standard engineering principles for design.

G. Silt fences may also be used in combination with chain link, haybales and bio-bags for additional structural support and/or sedimentation effectiveness. Chain link fencing shall be placed directly behind temporary silt fence for additional structural control. Haybales may be used in front of the silt fence for sedimentation or behind the silt fence for structural improvement. Biobags or coarse mulch are most effective in front of the silt fence, either adjacent to or upslope within 3 feet of the silt fence.

Maintenance/Removal Guidance

A. Sediment fences shall be inspected by applicant/contractor immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs, relocations or additions shall be made immediately.

B. At no time shall more than 1-foot depth of sediment be allowed to accumulate behind a sediment fence. Sediment should be removed or regraded into slopes, and the sediment fences repaired and reestablished as needed.

C. Fences shall be removed only when upslope areas are permanently stabilized. This may require a post construction completion visit to remove fencing.

Primary Purpose

- To divert or provide a barrier to surface flows and slow flows coming off a project.
- To contain sediments on-site.
- Limited capacity to filter sediment from flows.

SHALL NOT be used:

- Sediment fence should never be used on steeper than 2:1 slopes (see Table 3-x for slope run limitations).
- Across streams and other drainage channels.

Installation Tips

- Dig trench and backfill at least 6 inches on top of fabric. Compact soil well. **DO NOT** lay the bottom fabric flap on the ground surface and pile soil onto it.

- Install sediment fence on horizontal contours. **DO NOT** install fence down the slope unless needed as a wing arm or to divert flow (see top view detail).
- Place mulch or Biobags along the upslope side of the sediment fence to provide additional sediment capture. This practice will keep silt from reducing the porosity of the fence fabric.

Signs of Failure

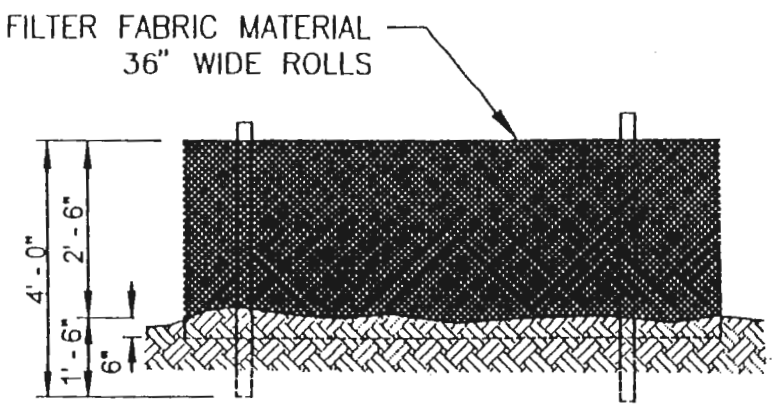
Sign of Failure	Cause	Solution
Concentrated runoff is coming from under the fabric of the fence.	▪ The bottom flap is not properly buried. ▪ Fence not installed on contour.	▪ Reinstall on contour with bottom fabric in trench and compact soil on top of the fabric.
Sediment fence is tipping over.	▪ Lack of penetration of stakes into a strong subgrade. ▪ Stake pockets are downslope, causing fence to fall when stake pocket fails.	▪ Reinstall correctly or add additional layer of silt fencing or install additional staking.
Excessive sediment buildup.	▪ Lack of timely maintenance. ▪ Spacing of fencing is too great – too long or too steep of slope.	▪ Clean out sediment from behind fence. ▪ Add additional fencing lines (see detail). ▪ Add groundcover, mulch, tackifier or other erosion prevention products upslope. ▪ Add winged sections to help divert and control flow.

TECHNICAL GUIDANCE HANDBOOK

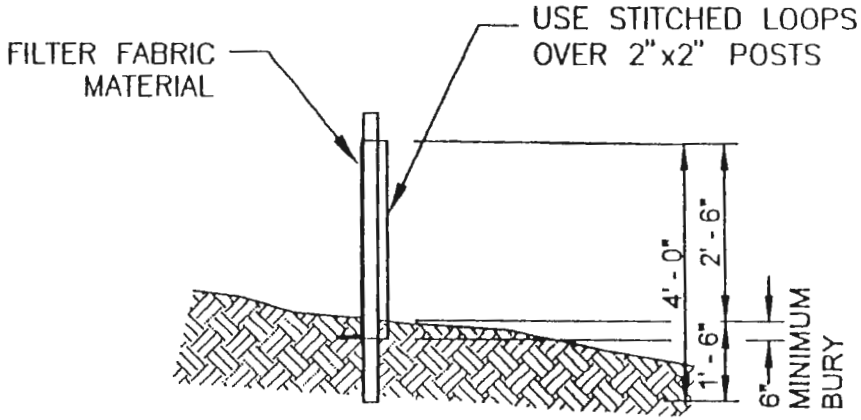
TEMPORARY SEDIMENT FENCE

Detail Drawing 3.4

p. 12

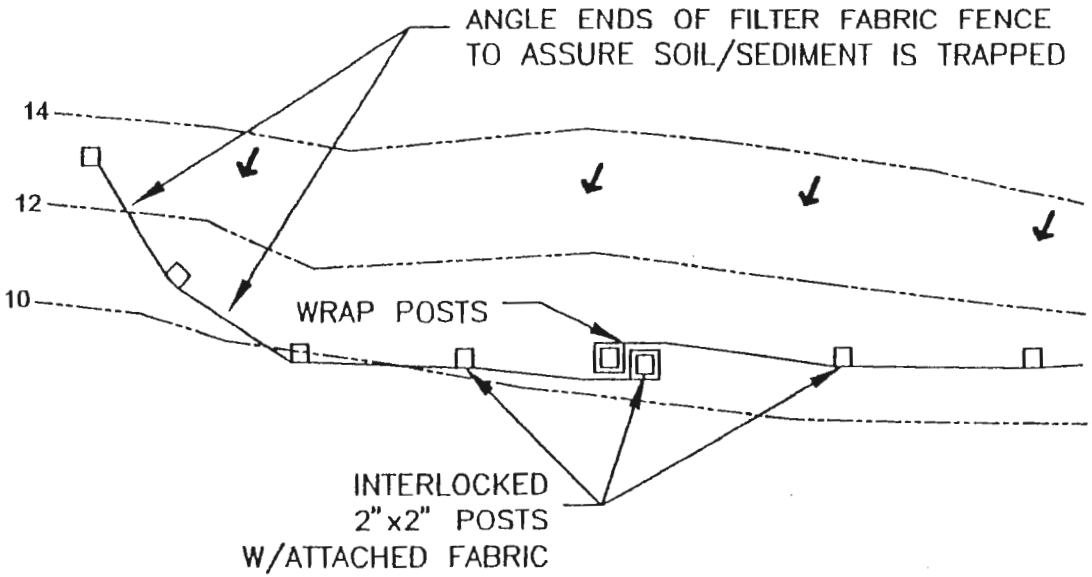


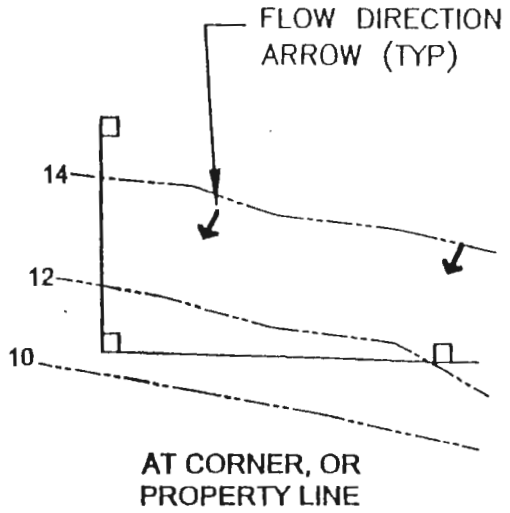
SIDE VIEW



SIDE VIEW

DRAWING NOT TO SCALE





TOP VIEW

DRAFT

3.5 Bio-Filter Bags

Purpose

To reduce the transport of sediment from a construction site by providing a temporary physical barrier to sediment and reducing runoff velocities.

Conditions Where Practice Applies

A. May be used for slope protection on single family or site development activities on existing lots of record, as approved, or as prescribed in the Erosion Control Matrix.

B. At toe of soil stockpiles.

C. On the upslope or downslope side of a silt fence line.

D. Bio-filter bags can be used in all newly constructed or existing drainage ditches and/or swales.

E. See the Detail Drawing for Bio-Filter Bag Catch Basin Protection.

Design Criteria/Specifications

A. See Detail 3-5 for details of bio-filter bag installation recommendations.

B. Bio-filter bags shall be clean, 100% recycled wood product waste. Size of bag can vary but generally are 28 to 20 inches long and weigh approximately 45 pounds, and made of ½-inch plastic mesh.

C. Stakes for bio-filter bags shall be installed as shown in the Notes on Detail Drawings 3-5A through 3-5C.

Maintenance/Removal Guidance

A. At no time shall more than a 6-inch depth of sediment be allowed to accumulate behind bio-filter bags. Sediment should be removed or regraded into the slope, or new lines of barriers installed uphill of sediment-laden barriers.

B. Once the upslope area is stabilized, bio-filter bags shall be removed or reused on-site. Bio-filter bags can be incorporated as mulch after completion of site work if approved by the jurisdiction. Removal may necessitate a post construction site visit.

Primary Purpose

- To contain sediments on-site.
- To slow surface water flow coming off a project.

SHALL NOT be used:

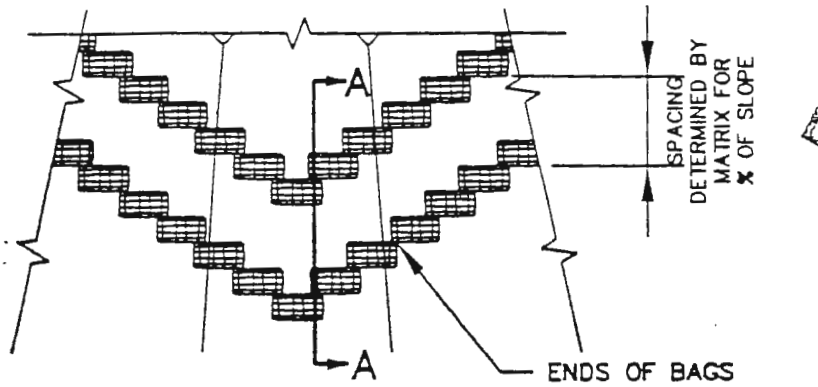
- Cross-streams and other drainage channels.

Installation Tips

- Use bio-filter bags in front of or behind the sediment fence to provide added sediment-holding capacity.
- Maintenance is critical. Empty, replace or add additional BMPs when 1/3 capacity of bags is full.
- Check flow rates often since high flows can limit performance and damage bags.
- Best used in low exposure/low sediment load areas.
- Check placement and performance often to avoid impacts from vehicle damage and/or vandalism.

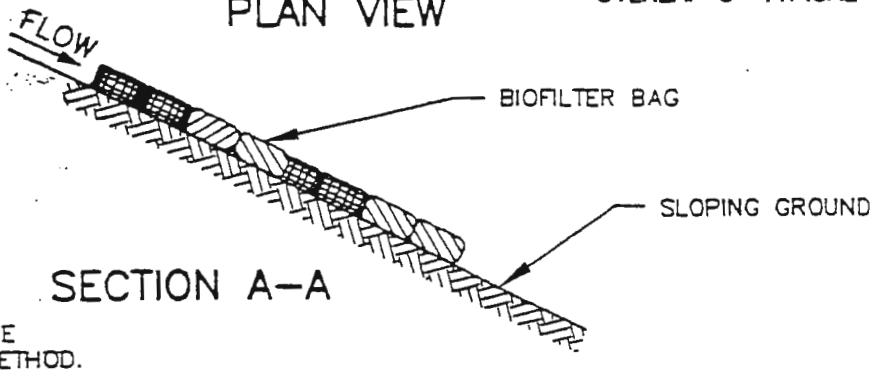
Signs of Failure

Sign of Failure	Cause	Solution
Concentrated runoff or sediment flows are coming around or under bags.	▪ Insufficient materials. ▪ Insufficient stake down during installation.	▪ Add additional materials and align to contain flows. ▪ Reinstall with proper staking and inset.
Sediment is overwhelming bags.	▪ Lack of upslope measures. ▪ Inadequate maintenance.	▪ Add erosion prevention or other sediment control BMPs. ▪ Clean out sediment from behind bags.



PLAN VIEW

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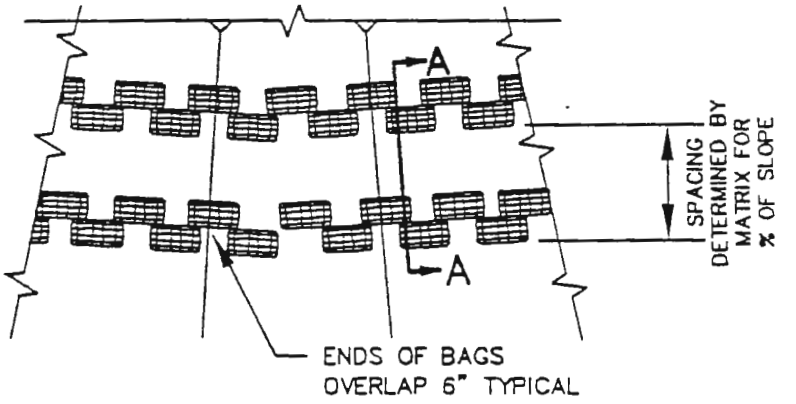


SECTION A–A

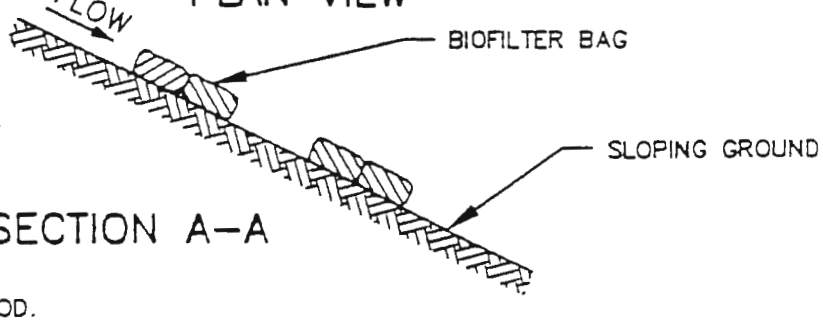
NOTE:
STAKING OF BAGS MAY BE REQUIRED WITH EITHER METHOD. USING (2) 1"x 2" WOOD STAKES OR APPROVED EQUAL PER BAG.

ALTERNATE #2

NTS



PLAN VIEW



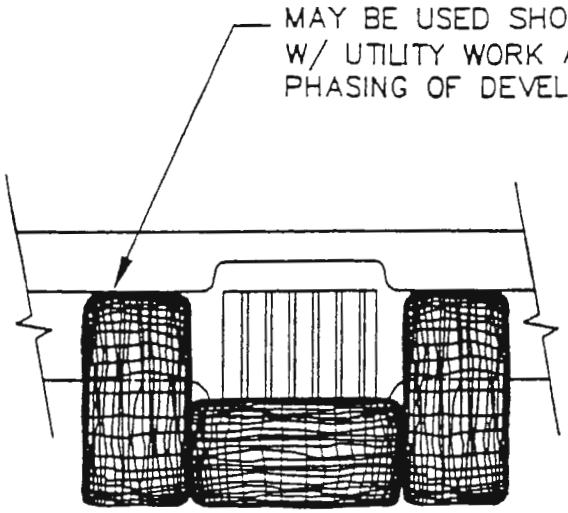
SECTION A–A

NOTE:
STAKING OF BAGS MAY BE REQUIRED WITH EITHER METHOD. USING (2) 1"x 2" WOOD STAKES OR APPROVED EQUAL PER BAG.

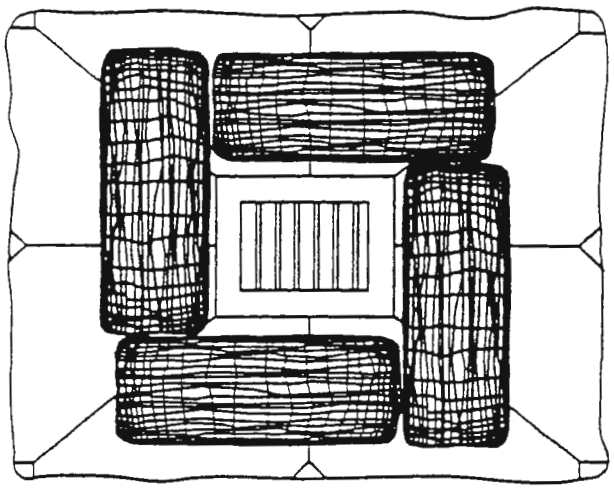
ALTERNATE #1

NTS

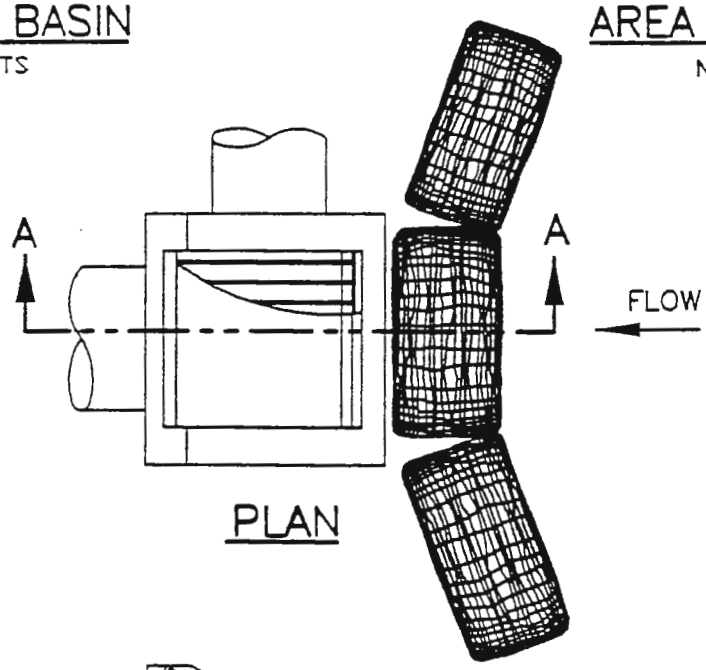
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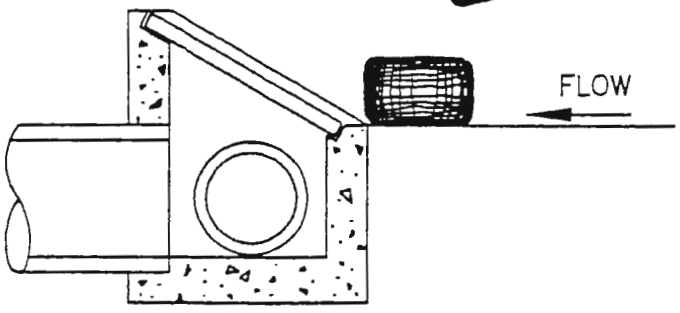
CATCH BASIN
NTS



AREA DRAIN
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PLAN



SECTION A–A

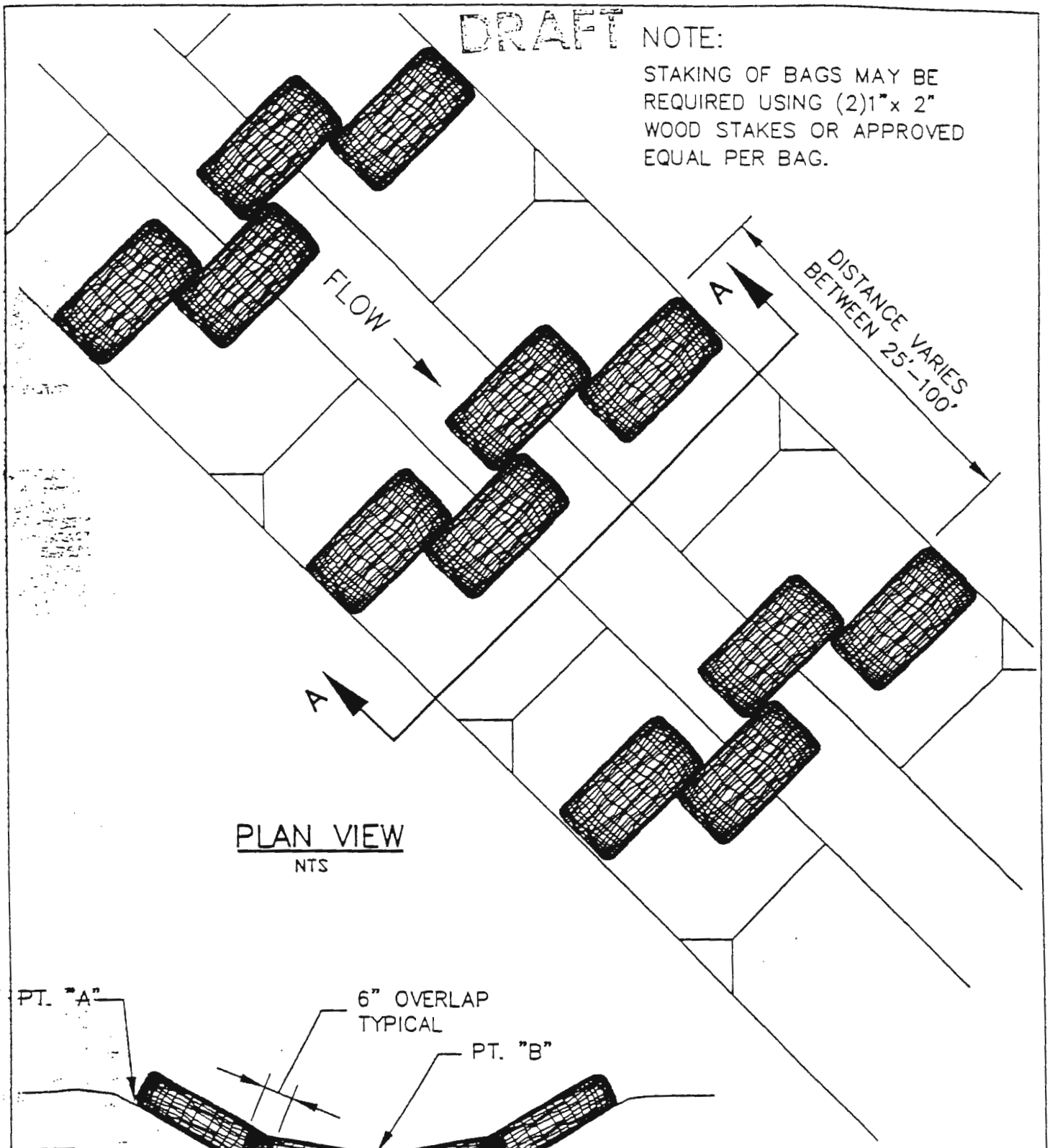
DITCH INLET
NTS

TECHNICAL GUIDANCE HANDBOOK	BIO–FILTER BAGS TEMPORARY Detail Drawing 3.5B p.16

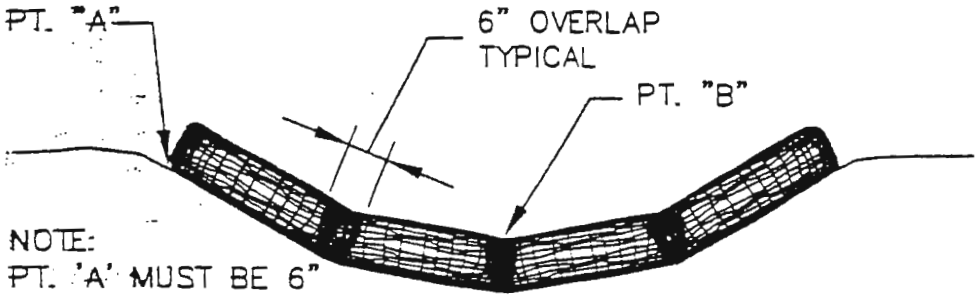
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NOTE:

STAKING OF BAGS MAY BE REQUIRED USING (2)1"x 2" WOOD STAKES OR APPROVED EQUAL PER BAG.



PLAN VIEW
NTS



NOTE:
PT. 'A' MUST BE 6" MIN. HIGHER THAN PT. 'B'

SECTION A–A
NTS

TECHNICAL GUIDANCE HANDBOOK	BIOFILTER BAG DITCHES AND SWALES Detail Drawing 3.3.5C

FILE DRAFT:INSPECTORS GRAPHICS DRAWING PLOT 1:1

3.6 Undisturbed Vegetated Buffers

Definition

Undisturbed buffers are swaths of preserved or established vegetation that act as perimeter controls for a project site. The rooted vegetation holds soils, acts as a wind break, and filters runoff that may leave the site. Vegetation should be at least 1-inch in height and provide 80% ground coverage.

Purpose

To reduce soil movement off-site by wind or rain. May act as an alternate, or in certain cases, a supplemental measure to sediment barriers or silt fences.

Conditions Where Practice Applies

An undisturbed buffer may be used as approved as an alternate to a sediment barrier at the toe of the site slopes if the buffer meets the following criteria:

A. The buffer is an undisturbed grassy area or covered with other approved dense vegetation.

B. The buffer is downhill and in the drainage path of the construction/disturbed area.

C. There are no concentrated flows from the disturbed site entering the buffer.

D. The buffer area is owned by the applicant or approved for such use in writing by the owner.

Design Criteria/Specifications

Before creating a temporary site control buffer, consider placement of permanent site vegetation. There may be an opportunity to install permanent site vegetation areas during construction to act as temporary sediment control measures.

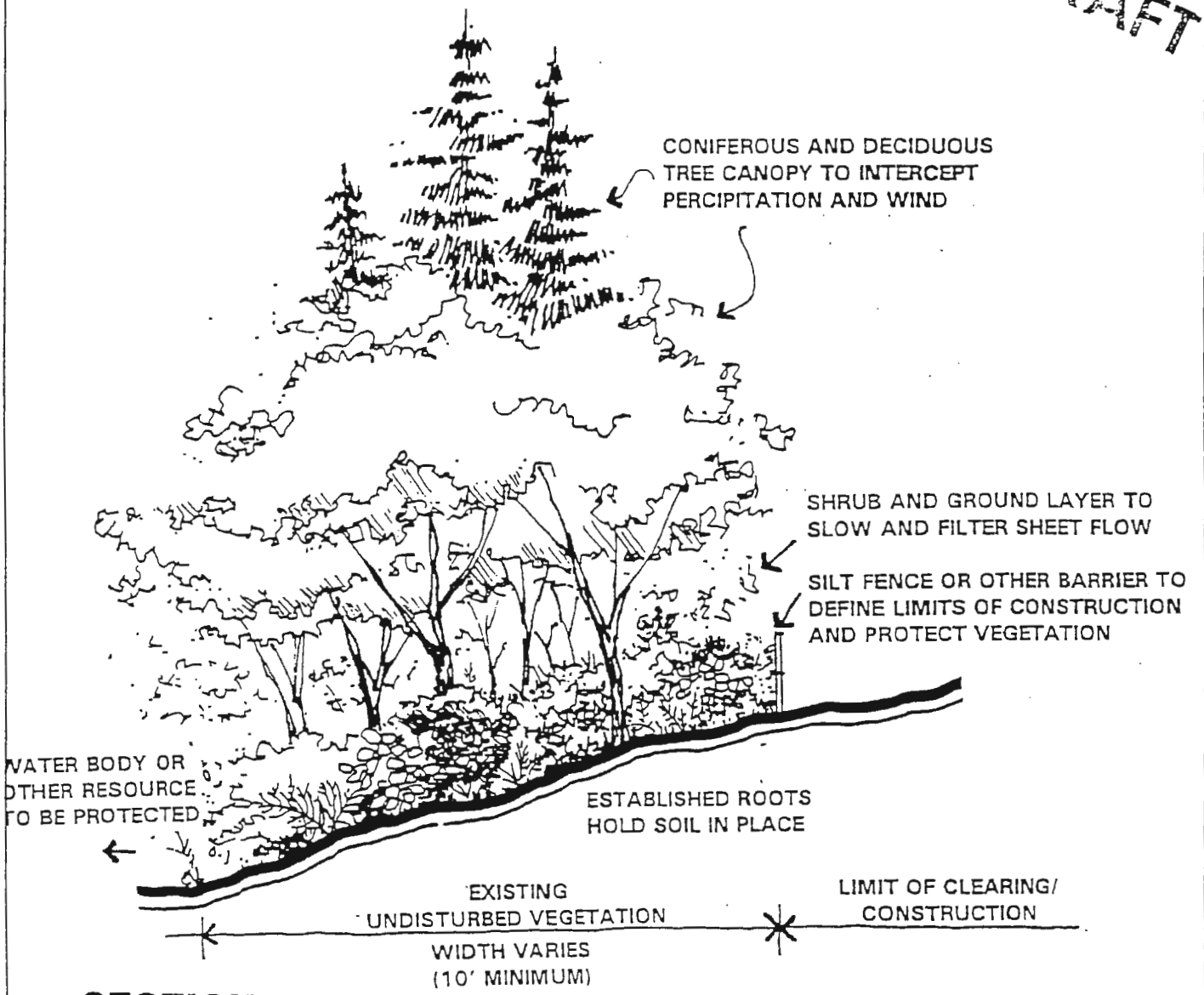
A. For preservation buffers, designate areas of no disturbance. Clearly mark these areas with flags, fencing or other visible method. Assure all site workers understand the meaning and use of these areas.

B. Buffers shall be sized according to the table below:

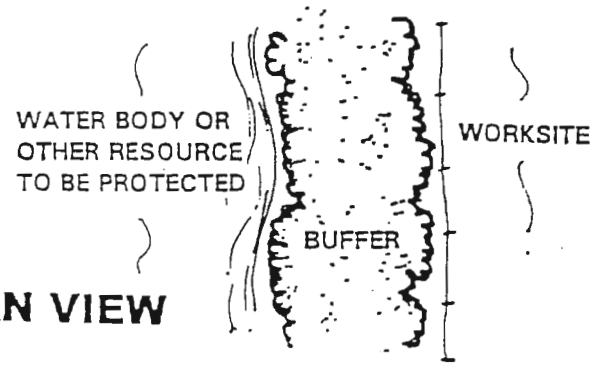
Buffer Width Requirements

[illegible]	[illegible]
Infill/flat site (<10%) slope	10 feet
Adjacent to waterways or other natural resources	The size of Environmental Zones or 25 feet
Steep slopes (>10%)	10 feet + 2* (% of slope)

DRAFT



SECTION



PLAN VIEW

TECHNICAL GUIDANCE HANDBOOK	VEGETATIVE BUFFER Detail Drawing 3.6

FILE DRAFT\INSPECTORS GRAPHICS DRAWING PLOT 11

3.7 Storm Drain Inlet Protection

Purpose

To reduce sediment from entering storm drain systems prior to permanent stabilization of disturbed areas.

Conditions Where Practice Applies

A. Where interior site storm drain inlets are operational before permanent stabilization of the disturbed drainage area, as approved by jurisdiction.

B. Adjacent to and immediately downhill of utility type construction in existing paved areas with catch basin drainage.

C. In public right-of-way areas for use during approved flushing operations.

Design Criteria/Specifications

A. Design criteria and specifications for four recommended alternative methods of storm drain inlet protection are presented on Detail Drawings 3-7A, B, C and D.

B. Berms may be required to direct drainage to flow through the filters and prevent bypassing of the inlets.

C. All gravels shall be no larger than 1-1/2-inch to ¼-inch rock and shall be larger than any mesh opening. Rock minus mixture should not be used unless washed in an appropriate location to get rid of fines.

D. Wrapped grates shall have fabric ends secured under the grate in such a manner as to not lift the grate allowing flows to bypass.

Maintenance/Removal Guidance

A. At no time shall more than six inches of sediment be allowed to accumulate against storm drain inlet protection measures. Sediment must be removed and inlet protection measures restored, as needed, to maintain their sediment trapping and filtering capability.

B. All facilities shall be removed after all construction is complete. Inlet protection should be the last BMPs removed from the site.

C. All catch basins shall be cleared of any sediment or debris that bypassed filter during site development.

Primary Purpose

- To act as a secondary perimeter, sediment control measure.

SHALL NOT be used:

- Alone without other site control BMPs.
- In high traffic areas.

NOTE: Inlet inserts may be preferable to these BMPs.

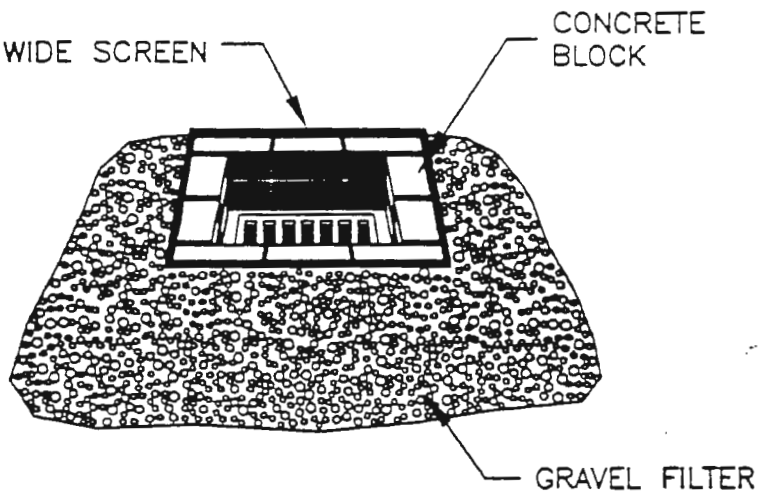
Installation Tips

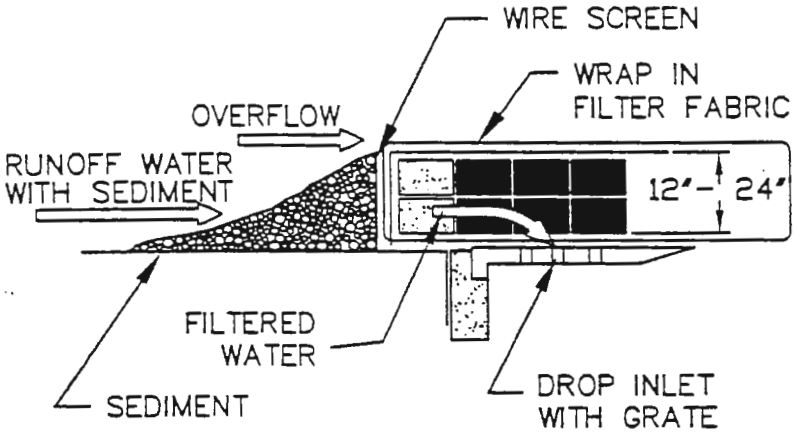
- For inlets using silt fence protection (3-7A), use more than one set to provide for enhanced protection from construction vehicles.
- Assure overlap joints in silt fence fabric pieces are appropriately welded or wrapped.
- For block inlet barriers (3-7B) and wire mesh barriers (3-7C), flag or otherwise mark block or gravel edges for easy identification under submerged conditions.
- Wrap blocks used for barrier in filter fabric before applying gravel to enhance filtration.
- For bio-filter bags, assure that no gaps exist under or between bags that could bypass flows. Bags shall be overlapped wherever possible.

Signs of Failure

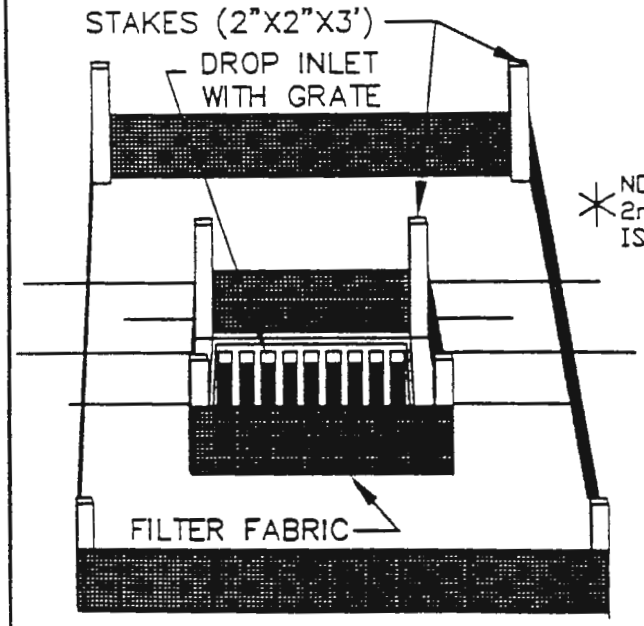
Sign of Failure	Cause	Solution
System not filtering.	▪ Fabrics or gravel have clogged.	▪ Remove, adequately clean and replace filter materials. ▪ Provide additional upslope erosion prevention or sediment control features.
Gravel has moved or Bio-Filter Bag has broken.	▪ System is impacted by traffic flows. ▪ Runoff has too high a flow rate or flow volume.	▪ Flag or redirect construction traffic away from inlet. ▪ Provide upslope check dams or other flow control and energy dissipaters.

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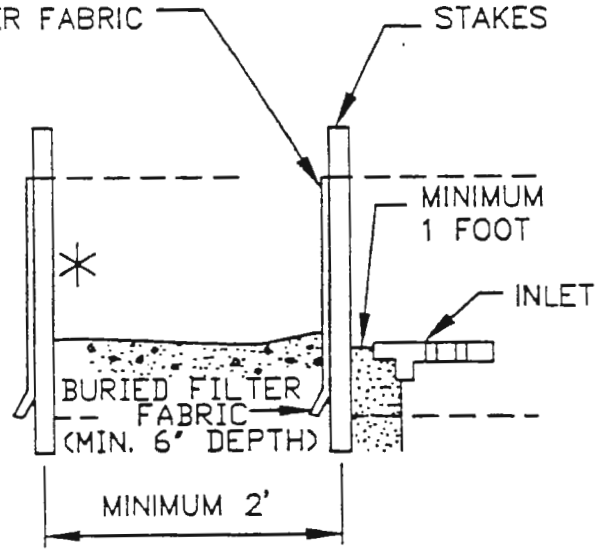




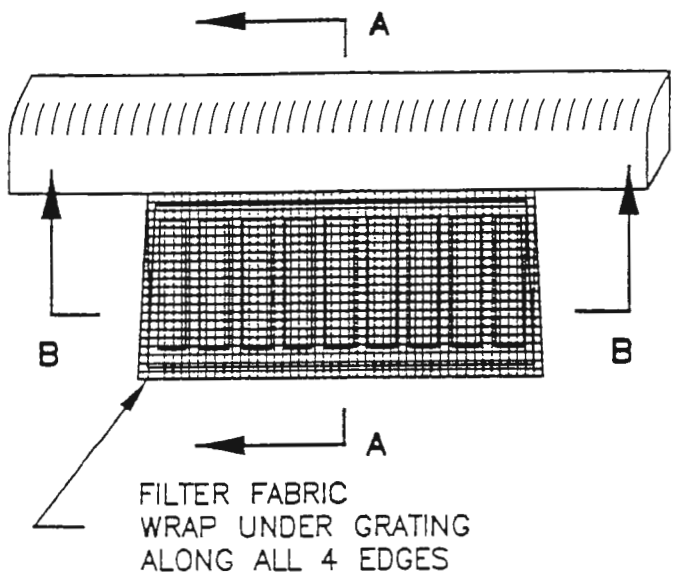
BLOCK & GRAVEL INLET BARRIER

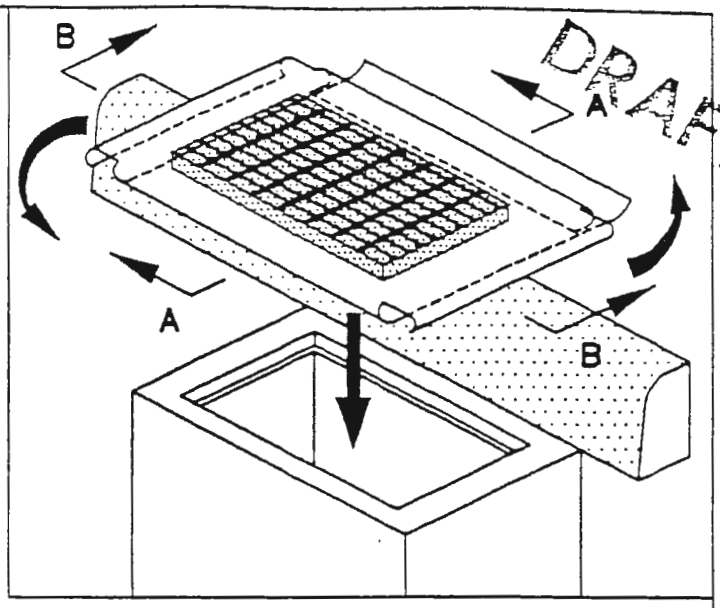


NOTE- 2nd FENCE SET IS RECOMMENDED

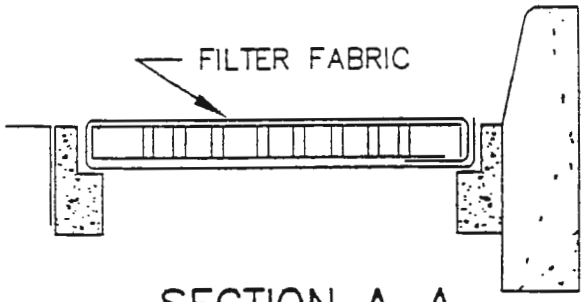


FILTER FABRIC INLET BARRIER (BEST FOR FIELD INLETS)

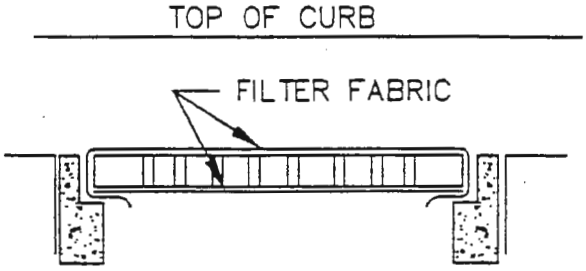




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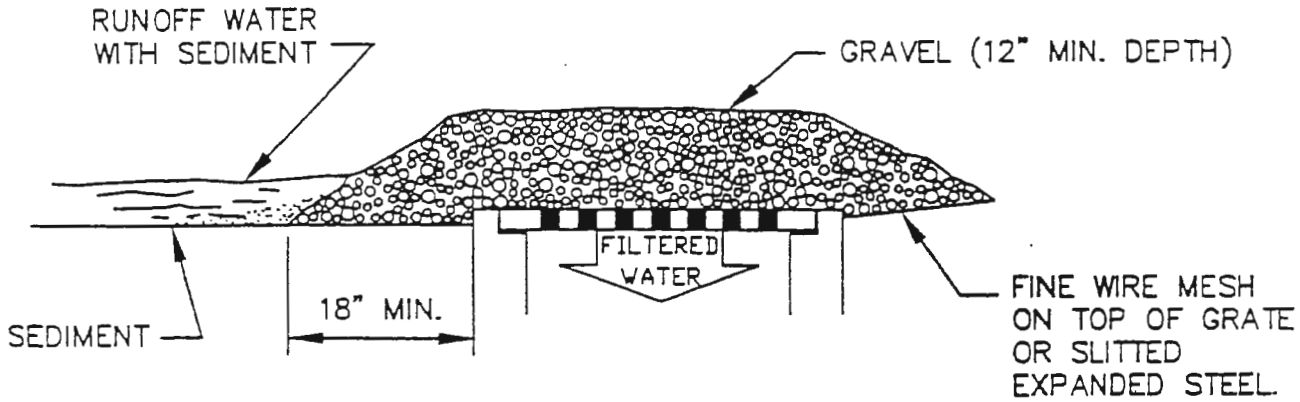


SECTION A–A



SECTION B–B

FABRIC WRAPPED INLET GRATE



GRAVEL & WIRE MESH INLET BARRIER

TECHNICAL GUIDANCE HANDBOOK	INLET PROTECTION MEASURES Detail Drawing 3.7B

3.8 Inlet Inserts

Description

Inlet inserts are a series of devices designed to trap and/or filter construction and storm water flows leaving a site. Inserts can include bags, racks, baskets and other materials that hang down into a catch basin or inlet. Inserts are made from filter fabric, wire mesh, metal plates, various types of plastic products and combinations of these and other materials.

Purpose

To trap and/or filter sediment and other materials from site runoff and to prevent clogging of catch basins and inlets.

Conditions Where Practice Applies

Any field or street inlet or catch basin that may receive permanent or construction related site runoff.

Note: These devices require additional upslope BMPs to be effective.

Design Criteria/Specifications

Devices shall be installed as per the manufacturer's instruction meeting the following criteria:

A. Devices shall be installed as a point protection or in series as a perimeter sediment control BMP prior to any site grading activity.

B. Installation shall not block flows from filtering into the inlet or catch basin.

C. Fabrics or other materials shall be sized to handle projected site runoff and sediment load flows.

D. Devices shall be installed without protruding parts that could be a traffic worker or pedestrian hazard.

E. Retrieval edges, cords, bars, chains or other mechanisms shall be flagged or marked for retrieval under submerged conditions.

Maintenance/Removal Guidance

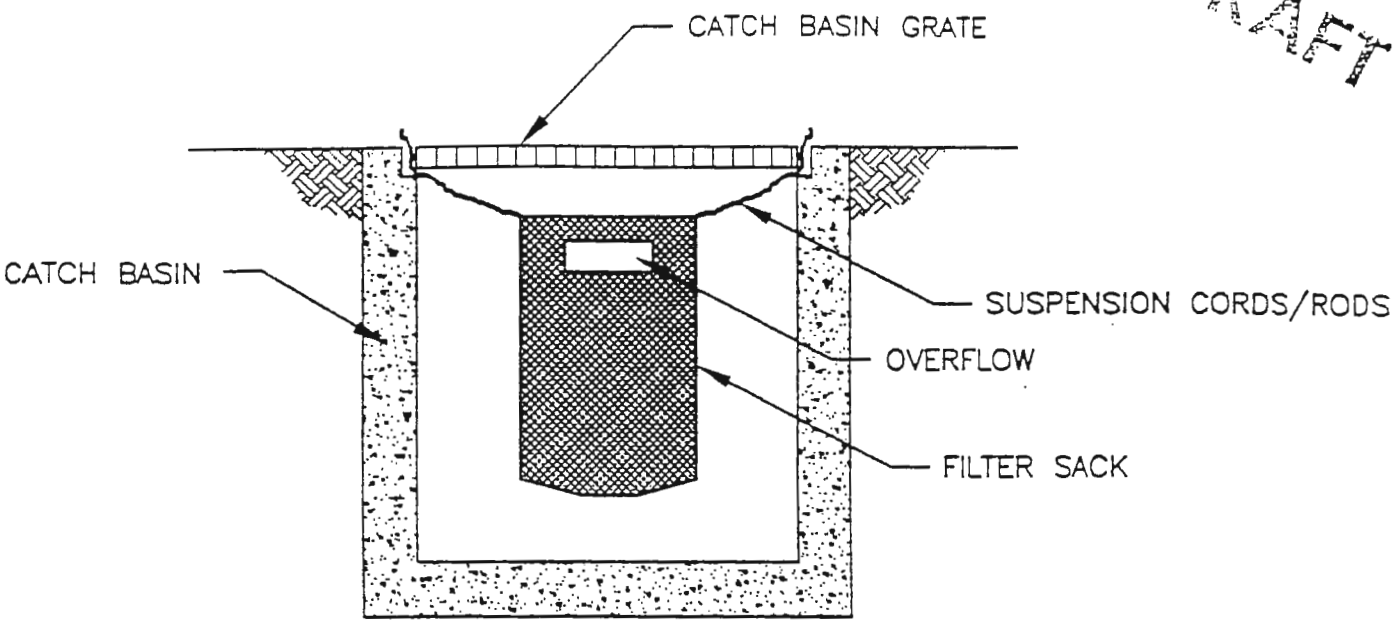
A. Inlet devices shall be inspected after every major rainstorm. During dry weather, devices shall be inspected every 2 to 3 weeks.

B. Like other sediment control devices, inserts shall be maintained when sediment consumes 1/3 of device or design capacity.

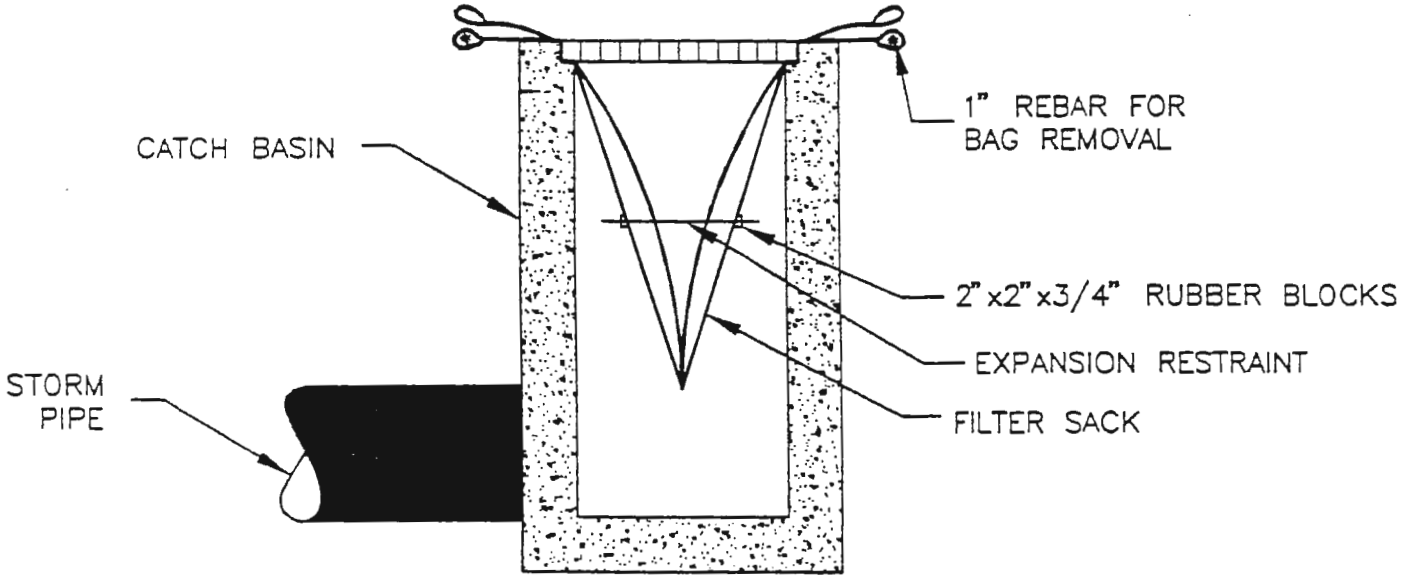
C. Replacement shall be per manufacturer's instructions or when device no longer drains. At no time shall devices be punctured or otherwise modified to bypass flows due to clogging.

D. Unless cleaned for reuse as a permanent site control, all devices shall be removed after construction is completed (or after permanent vegetation is established).

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INSERT SACK
FRONT VIEW



INSERT SACK
SIDE VIEW

NOTE:

RECESSED CURB INLET MUST BE BLOCKED WHEN USING FIILTER FABRIC INLET SACKS. SIZE OF FILTER FABRIC INLET SACK TO BE DETERMINED BY MANUFACTURER.

FILE: DRAFT/INSPECTORS GRAPHICS DRAWING

3.9 Temporary Interceptor Dikes and Swales

Purpose

To intercept storm runoff from drainage areas above unprotected slopes and direct to a stabilized outlet. To intercept storm runoff from a disturbed site and direct it to a sediment trap or pond. To be installed as a permanent site drainage feature and used for conveyance of temporary construction flows.

Conditions Where Practice Applies

A. Diversion of drainage around or away from work areas.

B. Where the volume and velocity of runoff from disturbed slopes is erosive and must be reduced or redirected. When an interceptor dike or swale is placed above a disturbed slope, it collects and conveys flows away from the slope reducing the volume of water reaching the disturbed area.

C. Interceptor dikes and swales can be used to direct site runoff to a sediment trap or pond, if applicable.

Design Criteria/Specifications

A. Flows shall be estimated for the drainage areas to be collected and/or conveyed by the dike or swale.

B. Interceptor dikes and swales shall be stabilized with approved cover before being put into use. Such cover may include grass, rock or erosion blankets.

C. Intercepted runoff must be directed to a stabilized area such as a pond, trap or other holding area. This diversion shall be designed in such a manner that no erosion occurs from the movement of the additional water volume and flow rate.

D. See Detail Drawing 3-9 for details.

E. Spacing between interceptor dikes and swales along slope contours is as follows:

Slope	Spacing
<5%	300 feet
5-10%	200 feet
10-40%	100 feet

F. Minimize construction traffic over dikes and swales. When unavoidable, provide for underdrains to ensure diverted water does not cross traffic areas.

G. The upslope side of interceptor dikes shall provide positive drainage to the dike outlet. Provide energy dissipation measures as necessary to minimize erosion at dike outlet.

H. Grades for drainage parallel to interceptor dikes shall be between 0.5% and 1.0% with a maximum flow velocity of 2 FPS (feet per second).

I. Maximum grade of interceptor swales shall be 5% and provide positive drainage to outlet.

Maintenance/Removal Guidance

A. Inspect after every major rainstorm for side, bottom, inlet and outlet scour.

B. Remove sediment and other debris when 1/3 of conveyance or design capacity is met.

C. Temporary dikes and swales shall be graded out at the completion of construction, when permanent vegetation has been established, unless they are designed for post development pollutant removal. If for permanent use, the dike or swale shall be refurbished prior to site close out.

Primary Purpose

- To convey flows away from work areas or exposed slopes.
- To collect flows at the bottom of work areas and convey them to a stabilized facility.
- To provide permanent pollution control and temporary construction flow management.

SHALL NOT be used:

- On slopes >5%.

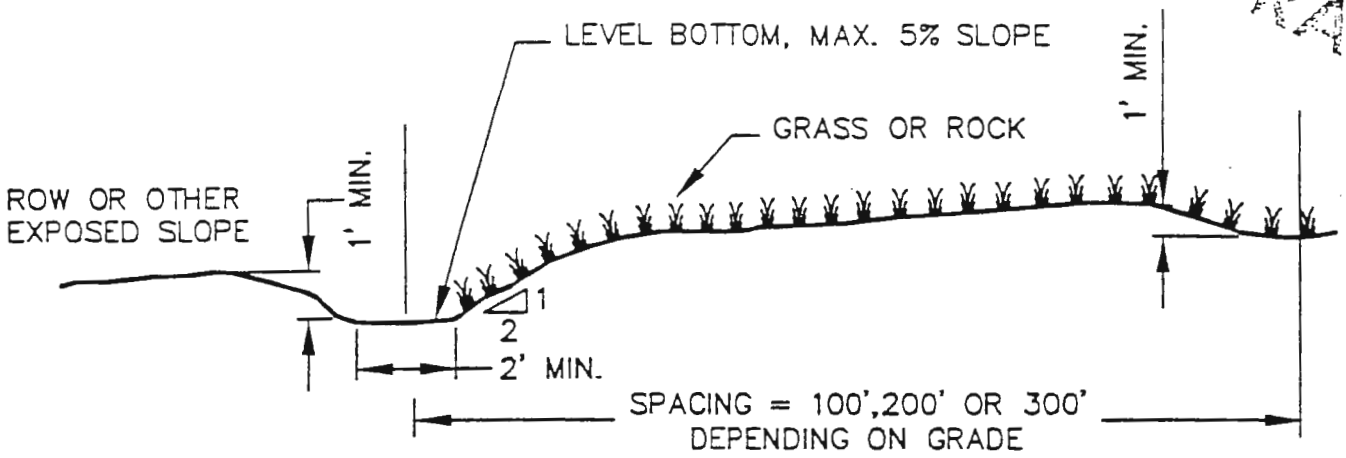
Installation Tips

- Consider installing dike or swale as a permanent water quality or conveyance feature for post development runoff control.
- Establish dike or swale layout early in site design and development process.
- Site swales and dikes on terraces of steep slopes and on contour. Allow enough room in the terrace to access for maintenance.
- Visibly mark locations and swales to help protect from construction traffic.
- Use check dams or other measures to control flow rate within dikes and swales.

Signs of Failure

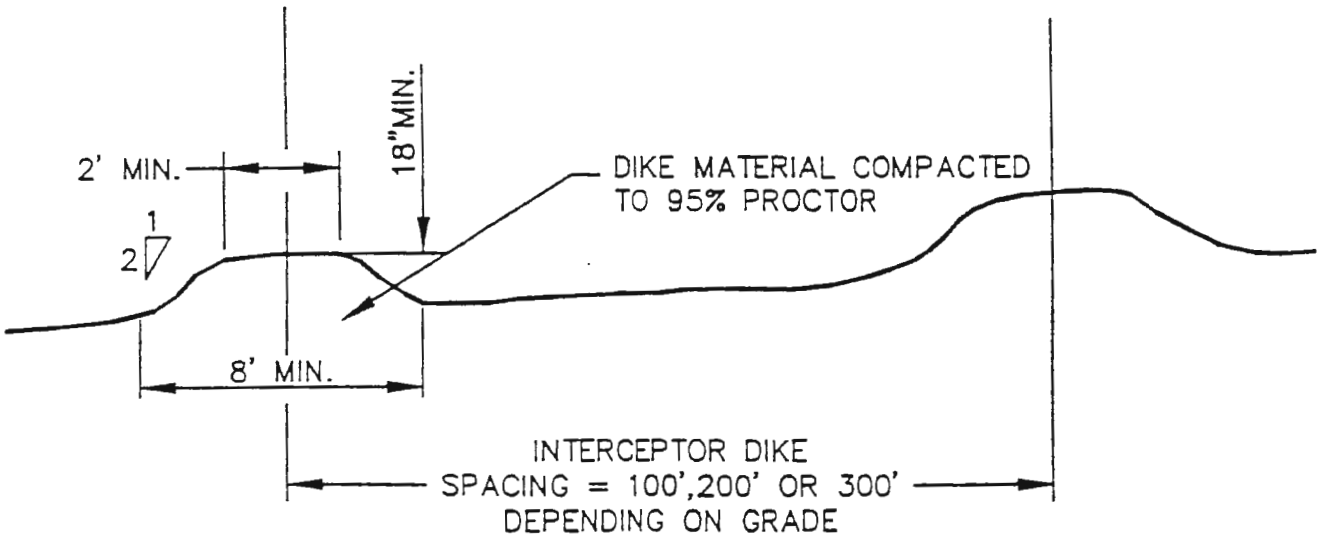
Sign of Failure	Cause	Solution
Erosion from dike or swale.	▪ Flows are flushing sediments out of system. ▪ Flows are eroding dike or swales themselves.	▪ Install additional check dams or energy dissipaters. ▪ Add additional vegetative mat or armoring cover to sides and bottom of swale or dike.

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BOTTOM, WIDTH	2 FEET MINIMUM, THE BOTTOM WIDTH SHALL BE LEVEL
DEPTH	1 FOOT MINIMUM
SIDE SLOPE	2H : 1V OR FLATTER
GRADE	MAXIMUM 5 PERCENT, WITH POSITIVE DRAINAGE TO A SUITABLE OUTLET (SUCH AS SEDIMENTATION POND)

INTERCEPTOR SWALE



TEMPORARY INTERCEPTOR DIKES

3.10 Check Dams

Purpose

To reduce the velocity of concentrated flows, reducing erosion of the swale, dike or ditch, and providing for sedimentation of suspended soil particles and other site pollutants. Check dams should not be used as permanent installations.

Conditions Where Practice Applies

A. In new or disturbed ditches, dikes or swales to reduce velocities and erosion.

B. In interior site ditches, dikes or swales conveying runoff from disturbed areas.

C. No check dams may be placed in streams.

Design Criteria

A. See Detail Drawing 3-10 for details

B. Check dams shall be construction of rock, coir/coconut fiber logs or tree logs. Check dams may also be constructed of straw bales or other materials as approved.

C. Construct a 1-foot-deep trench immediately upstream of check dams for storage of settled sediment.

D. Check dams shall be spaced such that the toe of the upstream dam is at the same elevation as the top of the next downstream dam.

E. Rock check dams shall be constructed of rock. The rock must be placed by hand or mechanical placement in a manner that completely covers the ditch or swale. Ensure that the center of the dam is lower than the edges.

F. Log check dams shall be constructed 4- to 6-inch-diameter logs (See Detail 3-10). The logs shall be embedded into the bottom channel at least 18 inches. Logs shall be keyed into side slopes at least 18 inches. Log check dams for higher velocity (>2FPS) channels shall have a licensed engineers design.

G. Check dams should be designed to have an armored scourpool on the downstream side of the check dam.

Maintenance/Removal Guides

A. Check dams shall be checked for sediment accumulation after each significant rainfall. Sediment shall be removed upon filling 1/3 of trapping height.

B. Temporary ESC check dams shall be removed when drainage is diverted to the permanent conveyance system or prior to construction site closeout. In no situation shall the same check dam remain in-place without significant restructuring for period of over 2 years.

Primary Purpose

- To reduce velocities in a ditch, dike or swale.
- To provide sedimentation behind the dam for construction site flows.

SHALL NOT be used:

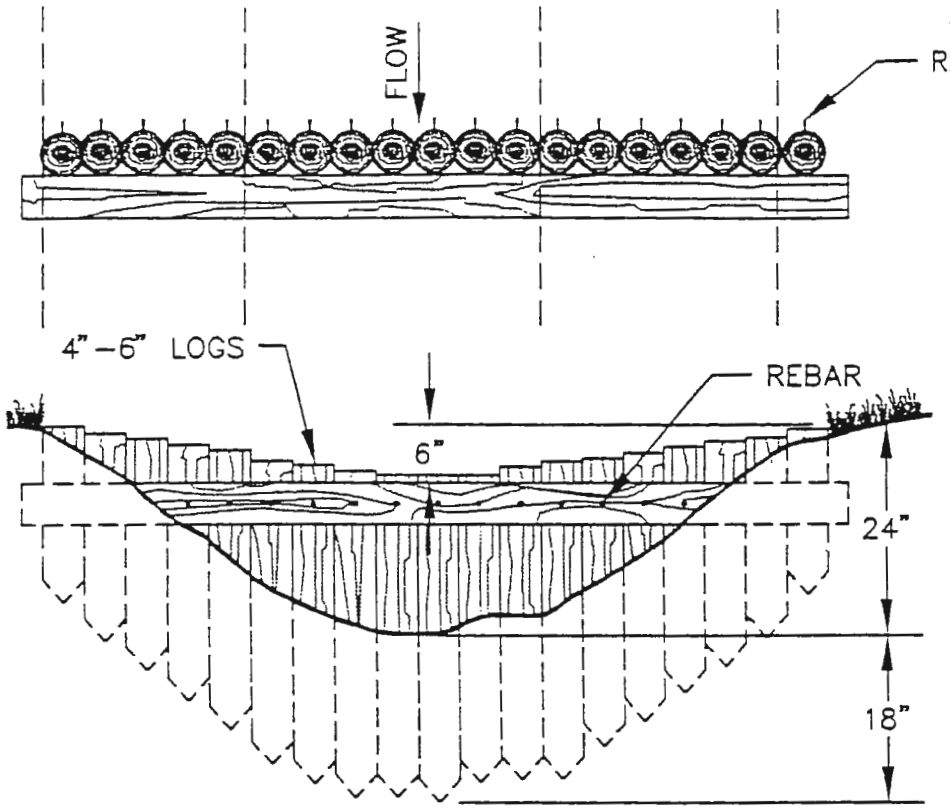
- Across natural channels (unless authorized/permitted).
- On slopes >30%

Installation Tips

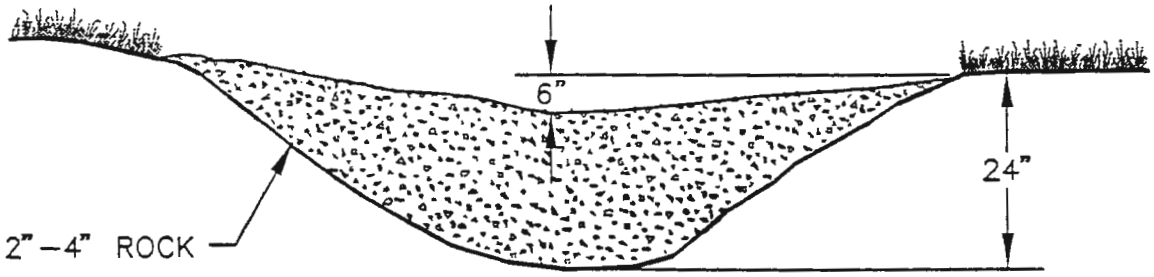
- Assure check dams are adequately keyed into side slopes to withstand flows and prevent end round washout.
- Assure materials make adequate contact with or are imbedded in the channel bottom.
- Consider using materials found locally on the site or that can be reused for another site purpose (i.e. mulch).
- Maintain check dams often.

Sign of Failure

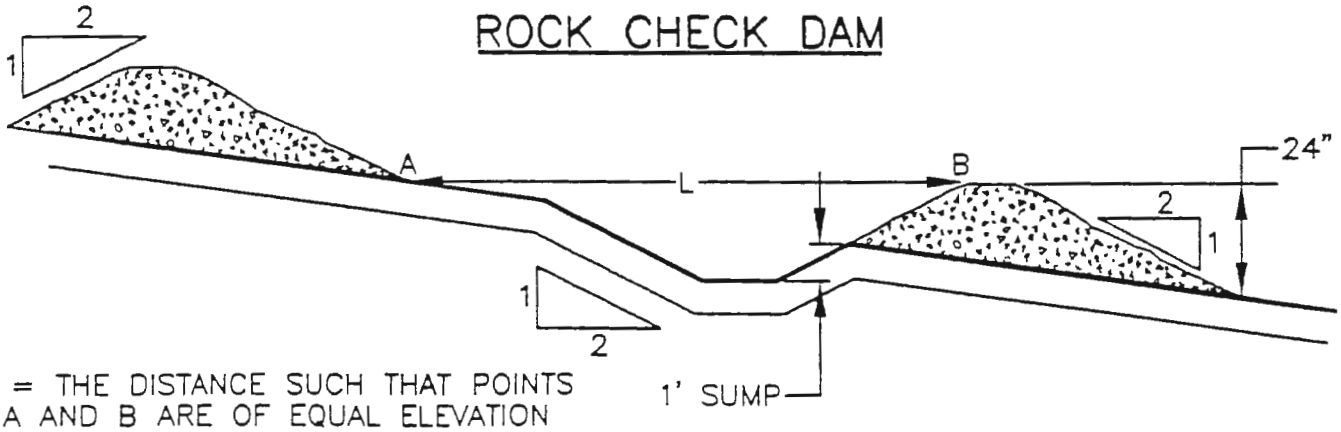
Sign of Failure	Cause	Solution
Check dam has blown out or material is displaced	▪ Materials not adequately anchored. ▪ Insufficient number or too much space between check dams.	▪ Replace materials with adequate anchoring ▪ Install additional or maintain upstream check dams.
Erosion is released from system	▪ Upstream check dams at or over capacity for sedimentation. ▪ Flows are scouring channel sides or bottom.	▪ Maintain check dams. ▪ Add additional check dams or other energy dissipaters. ▪ Add soil protection measures like vegetation mats or armoring.



LOG CHECK DAM



ROCK CHECK DAM



L = THE DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION

SPACING BETWEEN CHECK DAMS

TECHNICAL GUIDANCE HANDBOOK	CHECK DAMS p. 34 Detail Drawing 3.10

FILE DRAFT:INSPECTORS GRAPHICS DRAWING 3.55

3.11 Pipe Slope Drain

Description

Pipe slope drains are temporary conduits, usually of flexible piping, that are placed from the top of the slope to the bottom of the slope to contain and convey runoff without coming in contact with bare slope soils causing erosion.

Purpose

To convey concentrated run off down steep slopes without causing erosion or saturating slide-prone soils.

Conditions where practice applies:

A. Where concentrated runoff must be conveyed down a slope or around a work area to prevent erosion.

B. To be combined with interceptor dikes or swales, to convey storm water from the entire drainage area above a slope to the base of the slope.

C. Especially useful prior to permanent drainage system installation.

Design Criteria/Specifications

Proper installation, pipe sizing and entry flow control are key to pipe slope drain success. Failure of the facility usually results in severe gully erosion.

A. See Detail Drawing 3-11 for details.

B. The collection and conveyance system shall be designed to handle site runoff generated from a 10-year, 24-hour peak flow events. In general, minimum recommendations for pipe sizing are as specified in the table below.

Recommended Slope Drain Size	
Maximum Drainage Area (ac.)	Pipe Diameter (inches)
0 - 0.5	12
0.5 – 0.75	15
0.75 – 1.5*	18
1.5 – 3.5*	24
3.5 – 5.0*	30

* *Inlet design becomes increasingly complex beyond this size. Engineered system required.*

C. Pipe slope drains shall be constructed from heavy-duty flexible materials such as nonperforated, corrugated plastic pipe or specifically designed flexible tubing.

D. Pipe slope drains shall be placed directly on the ground or buried under the surface. The soil around and under the pipe entrance shall be thoroughly compacted to prevent undercutting. In addition, exposed soils shall be vegetated to prevent gully erosion from occurring beneath the pipe.

E. The inlet/entrance to the pipe shall be a standard flared end section with a 6-inch metal toe plate or approved equal, to prevent runoff from undercutting the pipe. The slope of the pipe entrance shall be at least 3% and oriented at an angle to collect flows.

F. Interceptor dikes, swales, berms or sediment barriers shall be used to collect and direct runoff into a slope drain. The height of any dike berm or barrier shall be at least 1-foot higher at all points than the top of the inlet pipe.

G. All pipe sections shall be watertight and anchored with hold-down grommets and/or stakes with cross wire straps. Anchors shall occur at intervals not to exceed 10 feet.

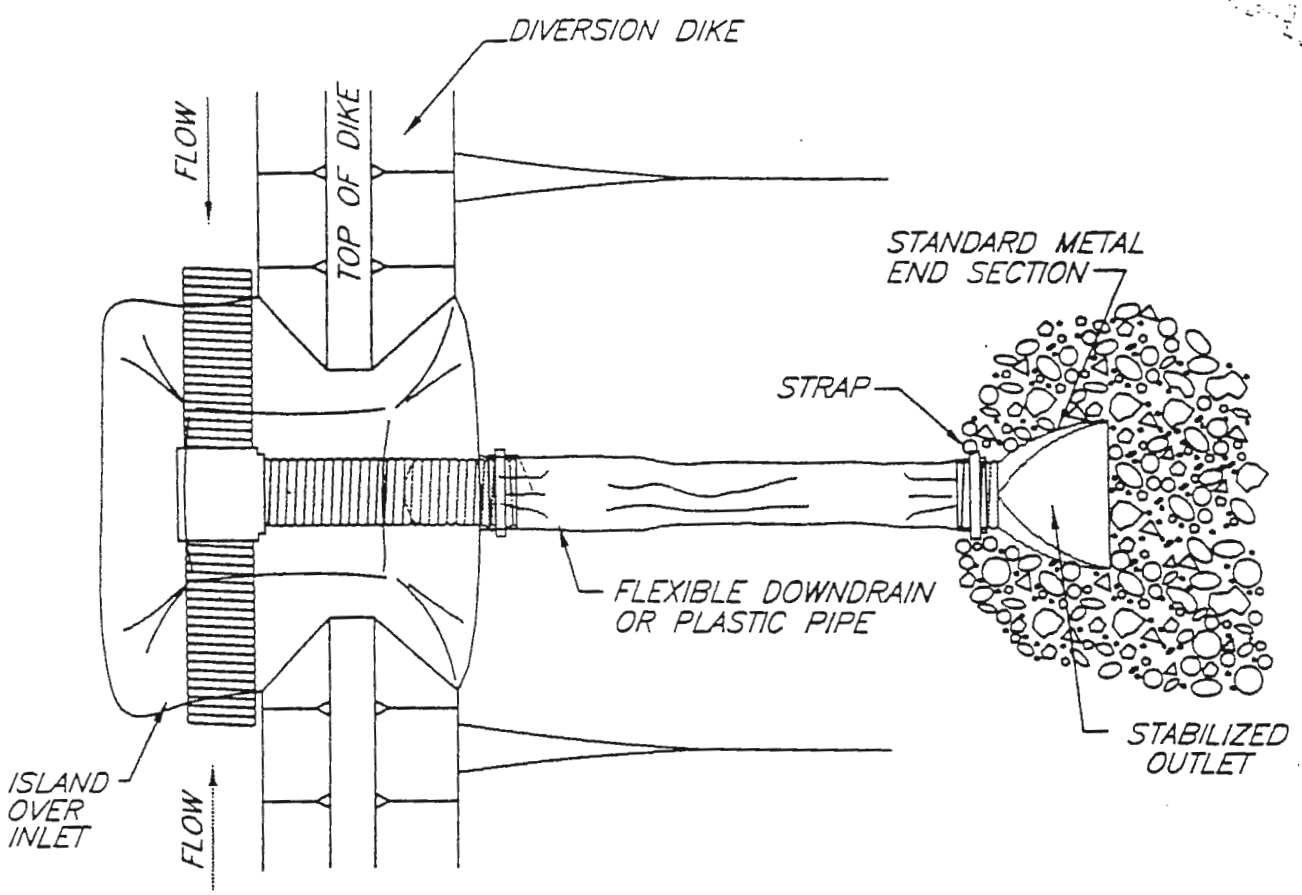
H. Pipe slope drains shall discharge into approved storm water management facilities. The area below the outlet must be stabilized with armoring and/or planned scour hole.

I. If the pipe slope drain is conveying sediment-laden water, measures to trap the sediment in the runoff must be used before the water is conveyed off-site.

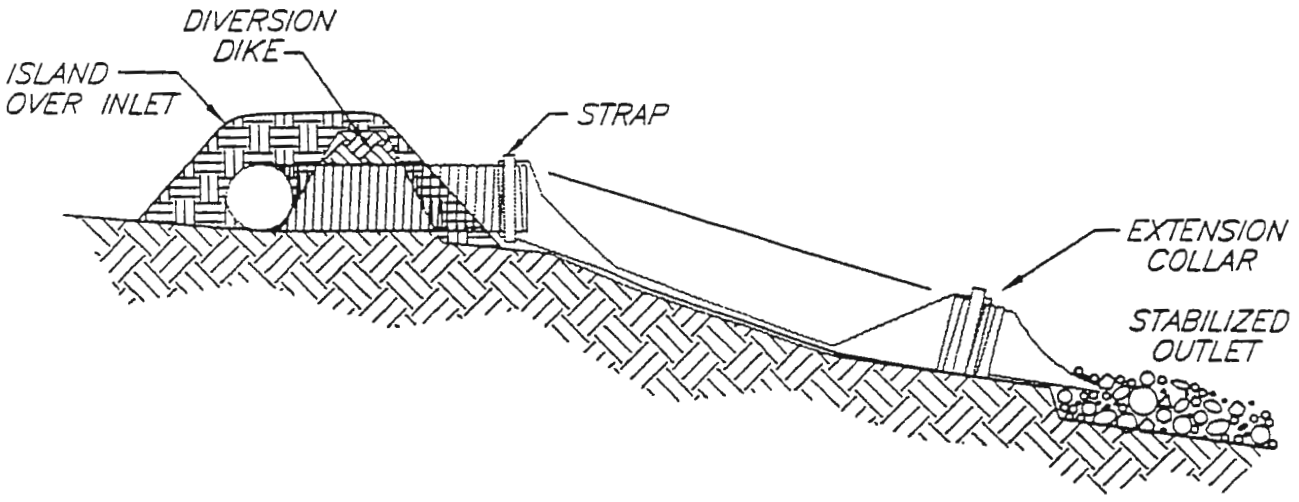
Maintenance/Removal Guidance

A. Check inlet and outlet points regularly, especially after heavy storms. The inlet should be free of undercutting and no water should be going around the pipe inlet. If erosion problems exist anywhere along the slope drain, any holes, rills or gullies shall be filled with soil, compacted and protected as necessary with appropriate materials such as erosion control blanks or rocks.

B. Temporary pipe slope drains shall be removed only after slopes have been stabilized, a permanent collection and conveyance system has been established, or when the conveyance of runoff down the slope is no longer needed to prevent erosion.



PLAN VIEW



SECTION

Detail Drawing 3.11

Pipe Slope Drain

3.12 Storm Water Barriers

Description

Storm water barriers are a group of portable materials, including hay bales, foam triangles, plastic dams, rock sack berms and other materials, meant to impound storm water and mud slows. These systems are many times manmade, can be modular and, therefore, replaced by sections, and may have sediment control abilities.

Purpose

To block or divert storm water or erosional flows from entering or exiting a site.

Conditions Where Practice Applies

A. As a dam for flow going off-site.

B. Emergency flow diversion or flow blockage.

C. Some products can be used to develop settling basins

D. Some products can act as inlet protect.

Conditions Where Practice Does Not Apply

A. Storm water barriers shall not be used in newly constructed or existing ditches, swales, streams, and creeks.

B. Straw bales shall not be considered as a means of filtering sediment and can be used alone only in emergencies. Straw bales shall not be used for catch basin protection.

Design Criteria/Specifications

A. For manmade products, install as per manufacturer's instruction's.

B. Straw bales shall be standard 40- to 60-pound rectangular bales of cereal grain or seed straw.

C. Stakes shall be wood of size shown on Detail Drawing 3-12A and driven through bales and into ground to a minimum depth of 12 inches.

D. Straw bales shall be keyed into existing ground 2 to 4 inches.

Maintenance/Removal Guidance

A. At no time shall more than 1/3 design depth of sediment be allowed to accumulate behind storm water barriers. Sediment should be removed or regraded into the slope, or new lines of barriers installed upstream of sediment-laden barriers.

B. Once the upslope area is stabilized, storm water barriers shall be removed for disposal or reuse, or for straw bales and other organic barriers, reused onsite. Straw and other organics can be incorporated as mulch after completion of site work if approved by the jurisdiction. Removal may necessitate a post construction site visit.

Primary Purpose

- Temporary impoundment of storm water or erosion laden flows.
- Straw barriers – for emergency sediment control or flows diversion.

SHALL NOT be used:

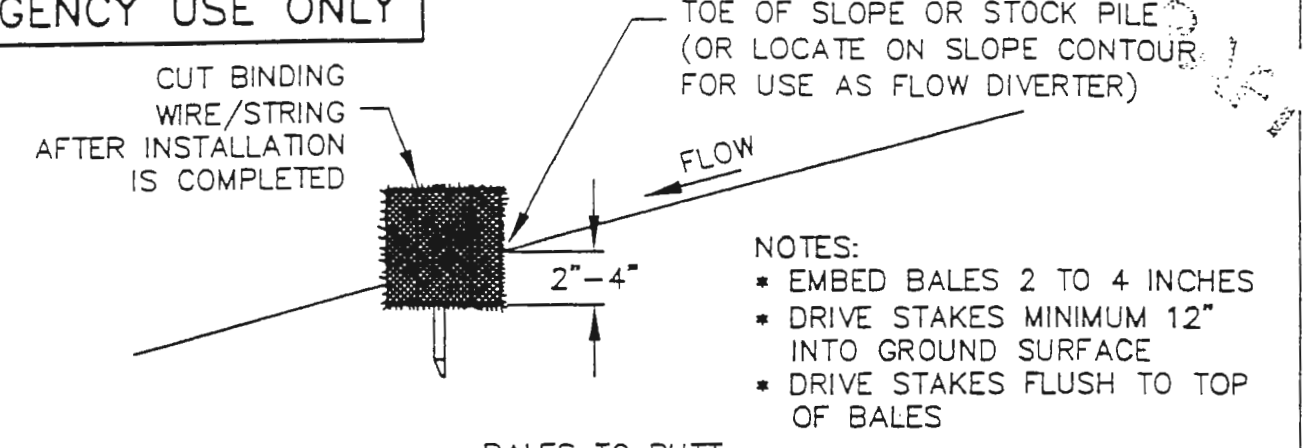
- Install per manufacturer specifications.
- Some may be good for use on impervious surfaces
- Use straw bales and other barriers in front of or behind sediment fence to provide added structural support and sediment holding capacity.
- Maintenance is critical. Empty, replace or add additional BMP's when 1/3 of capacity behind barrier is full.
- Check flow rates often since high flows can limit performance and damage the barrier.
- Check placement and performance often to avoid impacts from flows and/or vandalism.

Preferred BMP's – more permanent type sediment control (ponds, traps) and flow diversion structures (temporary swales) are better choices for long term projects.

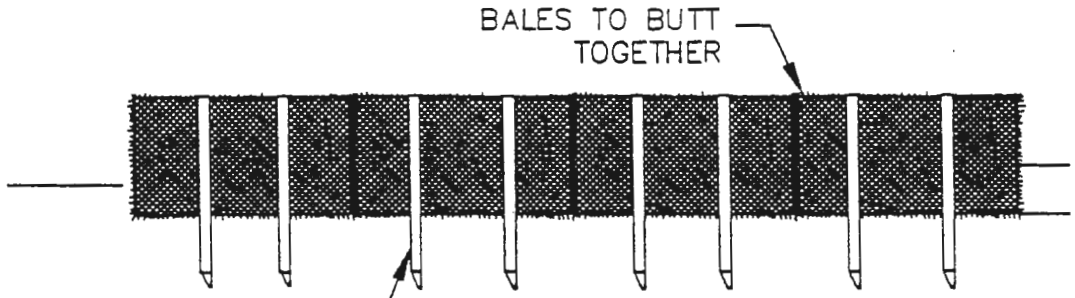
Signs of Failure

Sign of Failure	Cause	Solution
Concentrated runoff or sediment flows are coming around or under BMP	▪ Insufficient materials. ▪ Insufficient stake down during installation.	▪ Add additional materials and align to contain flows. ▪ Reinstall with proper staking and inset.
Sediment is overwhelming BMP	▪ Lack of upslope measures. ▪ Inadequate maintenance.	▪ Add erosion prevention or other sediment control BMP's. ▪ Clean out sediment from behind BMP's.

EMERGENCY USE ONLY

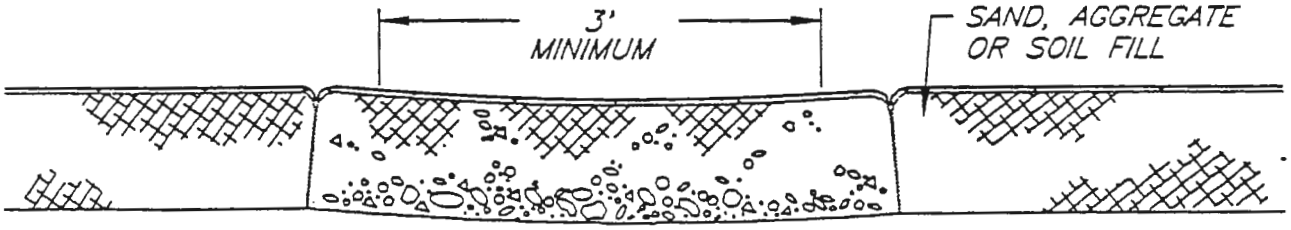


NOTES:
* EMBED BALES 2 TO 4 INCHES
* DRIVE STAKES MINIMUM 12" INTO GROUND SURFACE
* DRIVE STAKES FLUSH TO TOP OF BALES



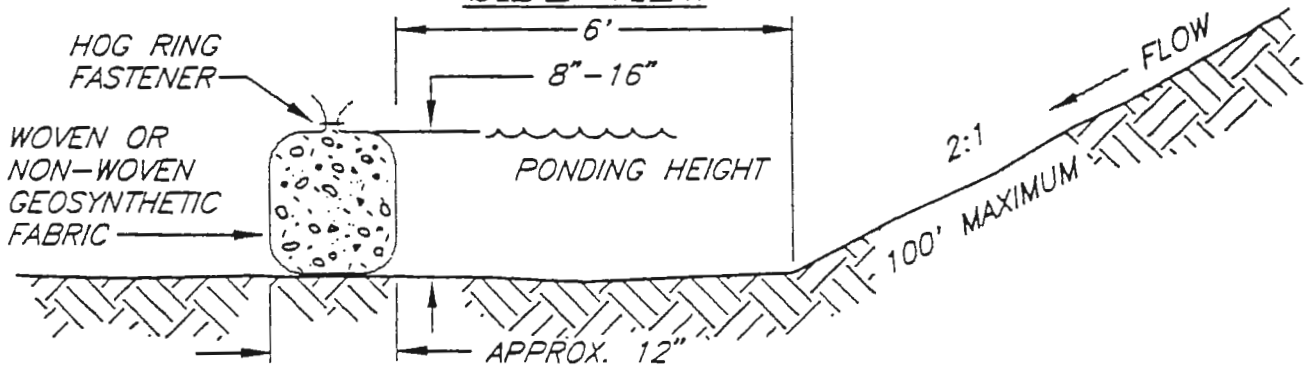
STRAW BALE

FRONT VIEW

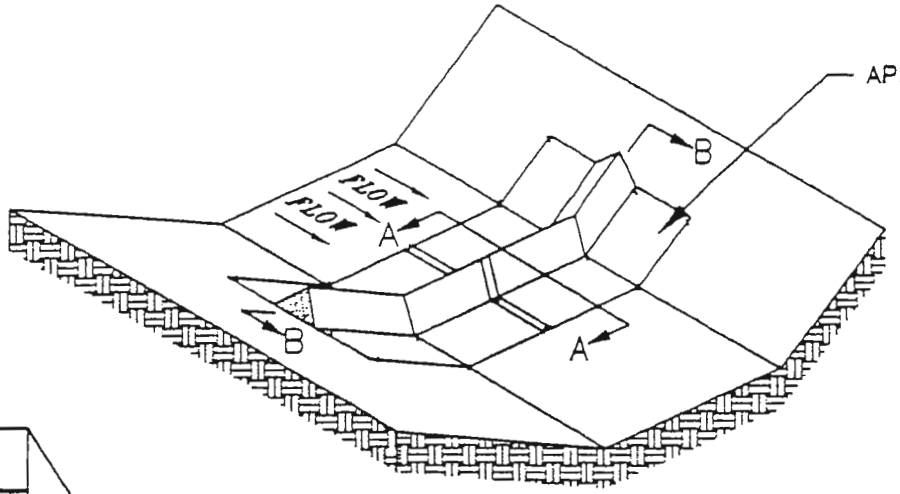


LOCATE DRAINAGE CHAMBER AT LOW SPOT FOR ADEQUATE DRAINAGE OF PONDED STORM WATER

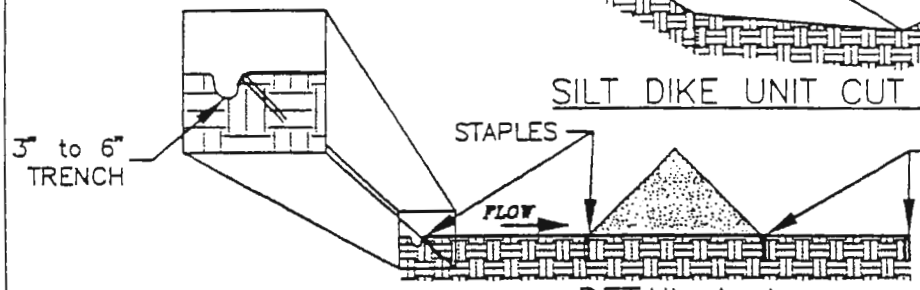
SIDE VIEW



CONTINUOUS BERM

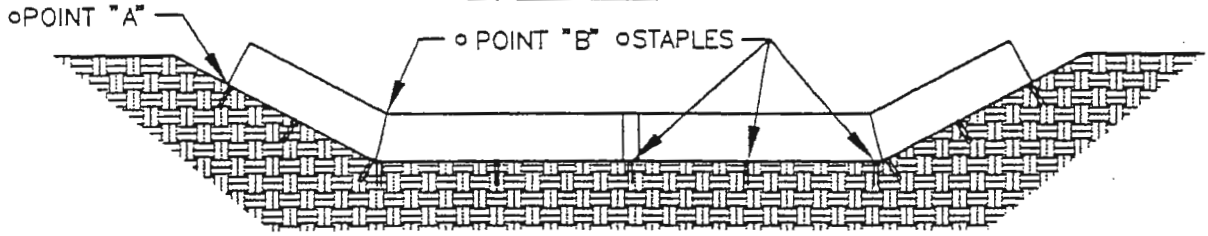


SILT DIKE UNIT CUT SECTION



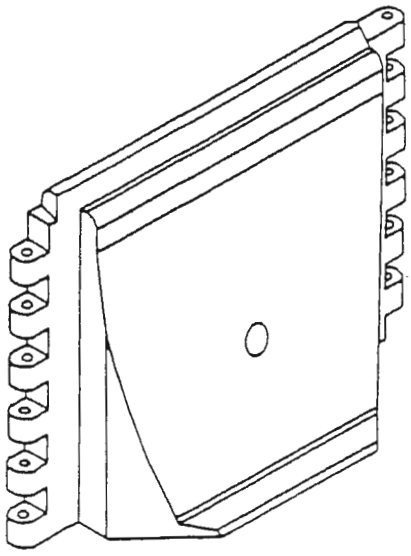
DETAIL A–A

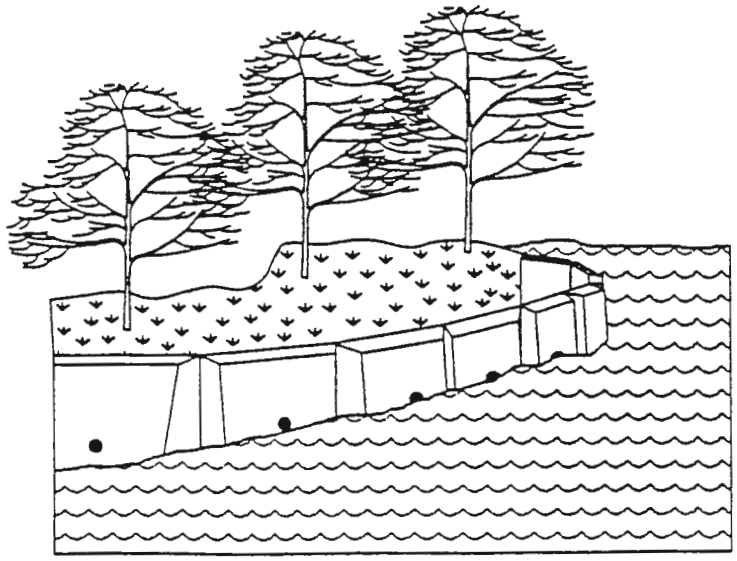
STAPLES SHALL BE PLACED WHERE THE UNITS OVERLAP AND IN THE CENTER OF THE 7' UNIT AS SHOWN ON THE DIAGRAMS



DIKE SECTION DETAIL B–B

TRIANGULAR SILT DIKE INSTALLATION FOR ROADWAY DITCH OR DRAINAGE DITCH





EROSION BARRIER

TECHNICAL GUIDANCE HANDBOOK	TRIANGULAR SILT DIKE AND EROSION BARRIERS Detail Drawing 3.1∂B

FILE DRAFT:INSPECTORS GRAPHICS

3.13 Sediment Traps and Ponds

Purpose

To collect and store sediment eroded from exposed ground surfaces disturbed during the construction period. Designers are encouraged to consider if ponds created to control sediment and other pollutants during construction could be used to control post development pollution.

NOTE: Given the NW climate and clay soils, most sediment traps and ponds, when used by themselves, will not meet "clear water" discharge standards.

Conditions Where Practice Applies

A. Downhill of areas with exposed soils.

B. Sediment Traps: Each trap shall have a tributary drainage area limited to 3 acres or less (but not including single-family and duplex residences constructed individually, on existing lots of record), and slopes of less than 50 percent.

C. Sediment Ponds: Each pond shall have a tributary drainage area of 10 acres or less and slopes are less than 50%.

Multiple traps or ponds may be needed to control sediments from leaving the site.

Design Criteria/Specifications

Because of site and soil variability, traps and ponds must be designed to meet specific site conditions. Facility size, configuration and flow limits vary based on particle size and settleability of site soils. In general, these facilities should be designed with adequate holding time to settle fine soils. Designers are encouraged to use multi-cell systems.

Temporary interceptor dikes or swales may be constructed to divert runoff to sediment traps or ponds.

Siting

The designer should consider sediment control needs during design – especially the need for sediment traps and ponds. In general, these facilities should be:

- Located off line from any natural site drainages;
- Located at the end of a site drainage control structure;
- Located on the lowest portion of the site; and
- Have no groundwater flows that could limit facility effectiveness;

- Shall have stabilized inlet, outlet and side slope structures capable of withstanding predicted flows prior to the facility receiving flow;
- Contain depth markers on the spillway and within the sediment basin to easily measure sediment deposits;
- Shall have a drainage system that dewaters the pond within 24 hours for maintenance;
- Have adequate access for maintenance procedures; and
- Be demarcated or otherwise flagged or fenced to protect the pond from construction vehicles.

The designer is also encouraged to consider use of any post development storm water management facilities for storm water control and/or partial sediment control during the site's construction phase. Post development storm water management facilities are not sufficient to handle flows during the site construction phase. They may be used for polishing of flows, but not for primary storm water and sediment control.

Inlets/Outlets

A. All inlet and outlet structures shall be adequately stabilized for predicted flows. The designer is encouraged to use armoring or erosion control blankets rated to withstand predicted flows. All inlet and outlet structures shall be completely stabilized prior to receiving any site flows. See storm water design manuals of your local jurisdiction for more guidance.

B. The design is encouraged to use a floating skimmer or a perforated riser with a gravel jacket, or an equivalent, to further filter outlet discharge from the trap or pond.

Sediment Traps

The sediment trap may be formed completely by excavation or by construction of a compacted embankment. It shall have a sediment storage depth not to exceed 1.5 feet, topped by a maximum 2-foot deep settlement zone. Sediment trap side slopes shall be 3:1 or flatter. The outlet of the trap should be a weir/spillway, providing a minimum 1-foot overflow depth between the spillway and embankment.

A turbidity curtain, fabric wrapped outlet or similar filter must be constructed to filter runoff from the trap prior to discharge from the construction site.

A. See Detail Drawing 3-13A for details.

B. Calculate the required sediment storage volume using the SCS Universal Soil Loss Equation as described in Appendix C and assuming a minimum one year sediment accumulation period for design purposes. For the purposes of this calculation, assume 1-cubic-foot of sediment weighs 100 pounds.

C. Determine the bottom surface area of the sediment trap using the calculated sediment volume and the maximum 1.5-foot depth and 3:1 side slope requirements.

D. Determine the total trap dimensions by adding an additional 2 feet of depth for settling volume (before overtopping of spillway) above the sediment storage volume, while not exceeding 3:1 side slopes. Consider free board within the spillway design.

E. A 3:1 ratio of trap length to width is desirable. Length is defined as the average distance from the inlet to the outlet of the trap as the average distance from the inlet to the outlet of the trap. Residence time will be likely soils dependent and should be sufficient to allow for adequate settling. A good rule of thumb is 36 hours of residence time with the system.

Sediment Ponds

A sediment pond may be formed by partial excavation and/or by construction of a compacted embankment. It may have one or more inflow points carrying polluted runoff. Baffles to spread the flow throughout the pond should be included. A securely anchored riser pipe is the recommended principal discharge mechanism, with an emergency overflow spillway. The riser pipe should be perforated and covered with filter fabric and gravel "cone" for filtration; or solid with a 1-inch-diameter dewatering hole and perforated drain pipe. Outlet protection shall be provided to reduce erosion at the pipe outlet. A turbidity curtain, fabric wrapped outlet or similar filter must be constructed to filter runoff from the pond prior to discharge from the construction site.

A. The sediment pond shall have a sediment storage depth no greater than 3 feet, topped by a 2-foot (minimum) to 4-foot (maximum) deep settlement zone and an additional 1-foot minimum of freeboard. The pond side slopes shall be 3:1 or flatter. Fencing of the facility may be required.

B. See Detail Drawing 3-13B for details.

C. The sediment storage volume is determined in the same manner as mentioned above for sediment traps.

D. The pond riser pipe and outlet pipe shall be sized to carry the 10-year design storm or shall meet the sizing criteria otherwise required by the local jurisdiction.

E. A 3:1 ratio between the pond length and width is desirable. Length is defined as the average distance from the inlet to the outlet of the trap. Use baffles in the pond to help prevent short-circuiting and to increase the effective pond length where site conditions prohibit constructing a pond with direct 3:1 length to width ratio.

Maintenance/Removal Guidance

Traps and ponds shall remain in place until an adequate portion of the site is stabilized or addressed adequately by other erosion prevention and sediment control BMP's. If the applicant wished to remove these facilities prior to complete site stabilization, the permitting authority shall determine when and under what conditions these traps and ponds may be removed.

Primary Purpose

- To control sediment laden flows leaving the site.

SHALL NOT be used:

- Alone without upslope clean storm water diversion and erosion prevention measures

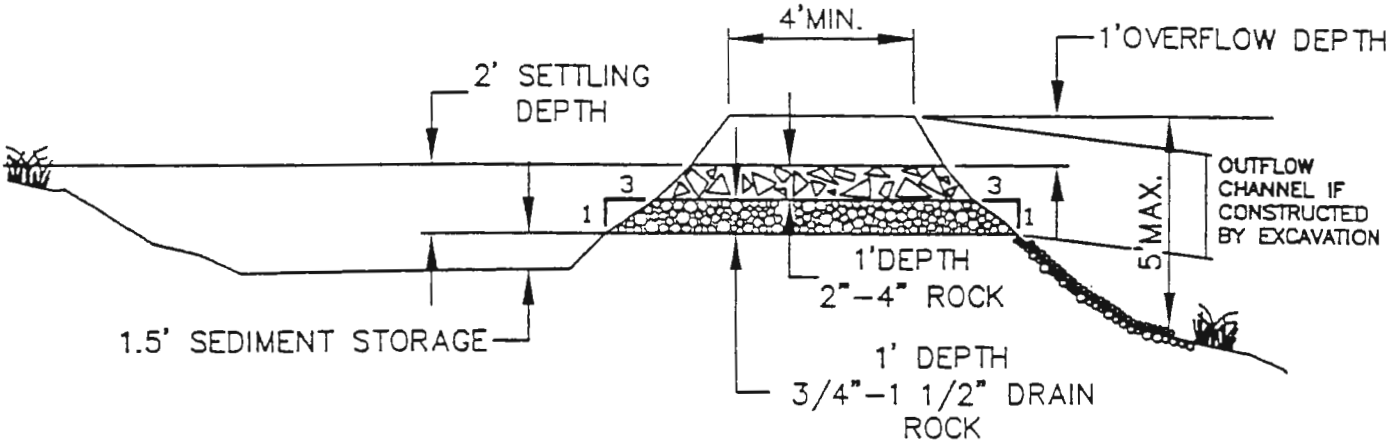
Installation

- Assure at the bottom of the drainage, sited on well-compacted and stabilized soils.
- Assure inlet and outlet structures are adequately designed for predicted flows.
- Do not route all storm water through pond. Segregate and divert clean storm water to approved receiving system.
- Consider using post development storm water management facilities as polishing facilities after the sediment pond or trap.

Sign of Failure

Sign of Failure	Cause	Solution
Muddy water exits pond	▪ Upstream erosion prevention controls are insufficient. ▪ Residence time in insufficient ▪ Outlet system does not adequately filter flows.	▪ Provide additional erosion prevention BMPs ▪ Recalculated sizing design, and upsize facility if needed. ▪ Alter outlet or cover with filter fabric to help filter flows.
Pond is overflowing	▪ Outlet is plugged ▪ Clean flows are running into the facility. ▪ Facilities are inadequately sized.	▪ Maintain system ▪ Divert any clean storm water flows around work site and facility, to approved receiving system. ▪ Review sizing criteria – upsize facility if needed.

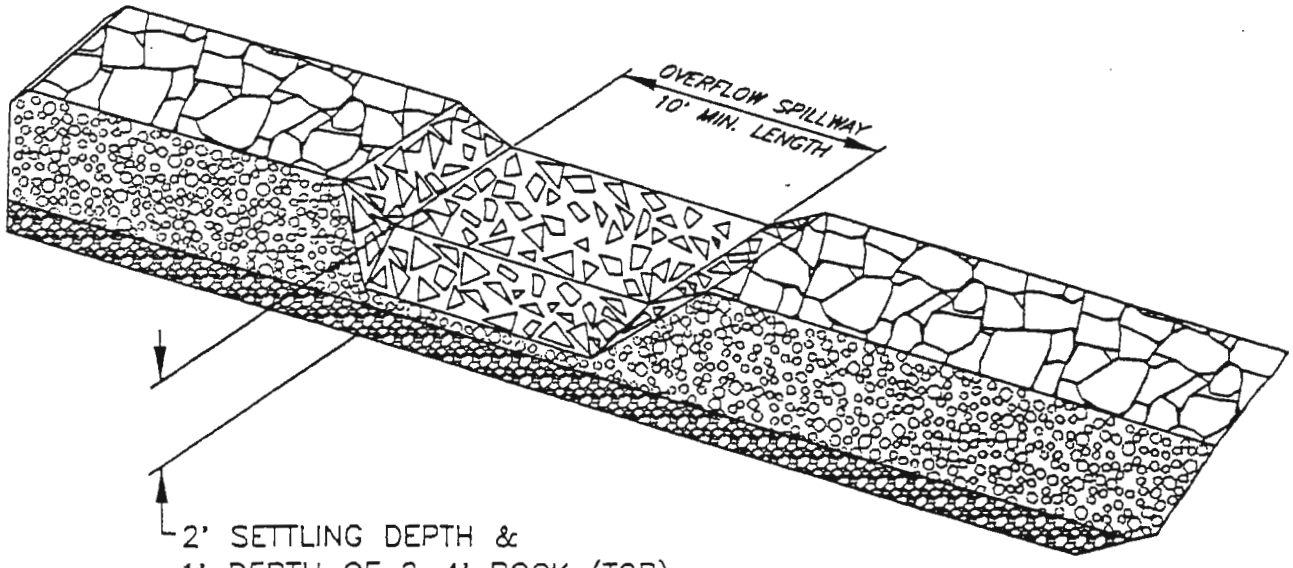
DRAFT



CROSS SECTION

NTS

NOTE: MAY BE CONSTRUCTED BY EXCAVATION OR BY BUILDING A BERM.

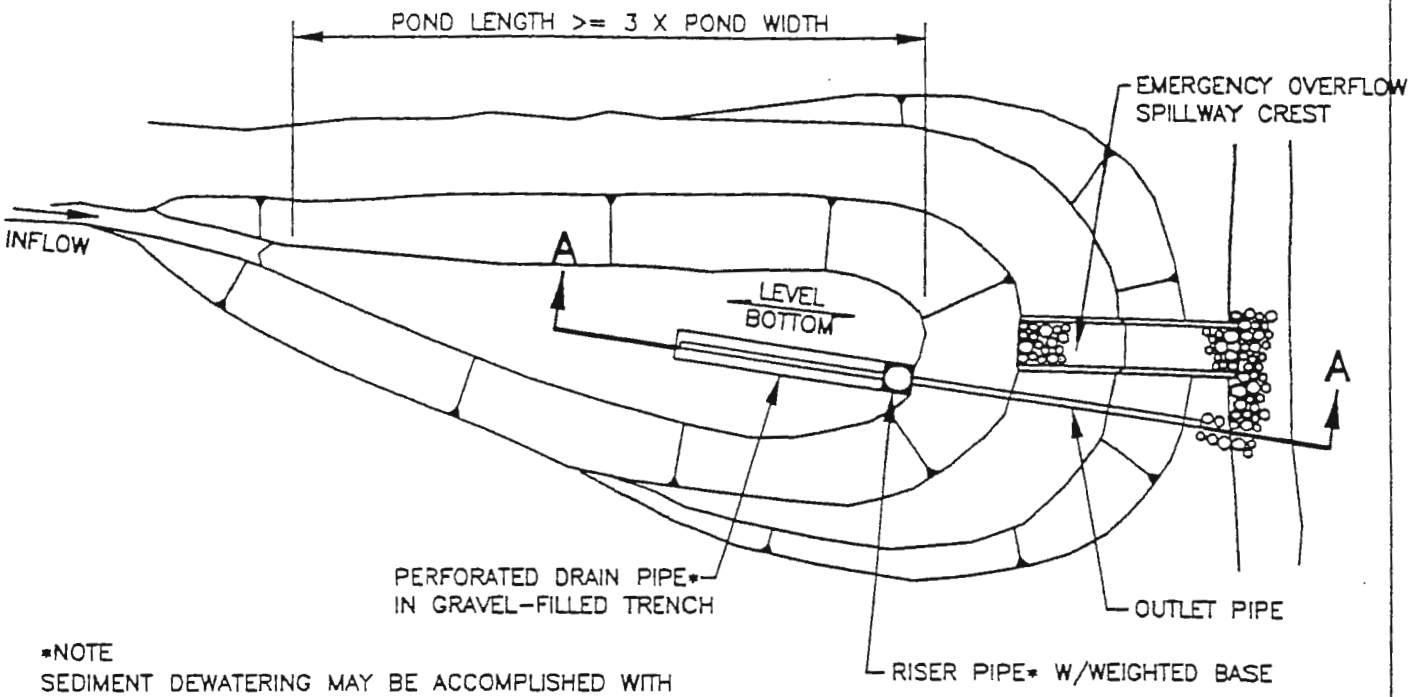


2' SETTLING DEPTH &
1' DEPTH OF 2–4' ROCK (TOP)
1' DEPTH OF 3/4"– 1 1/2" DRAIN ROCK (BOTTOM)

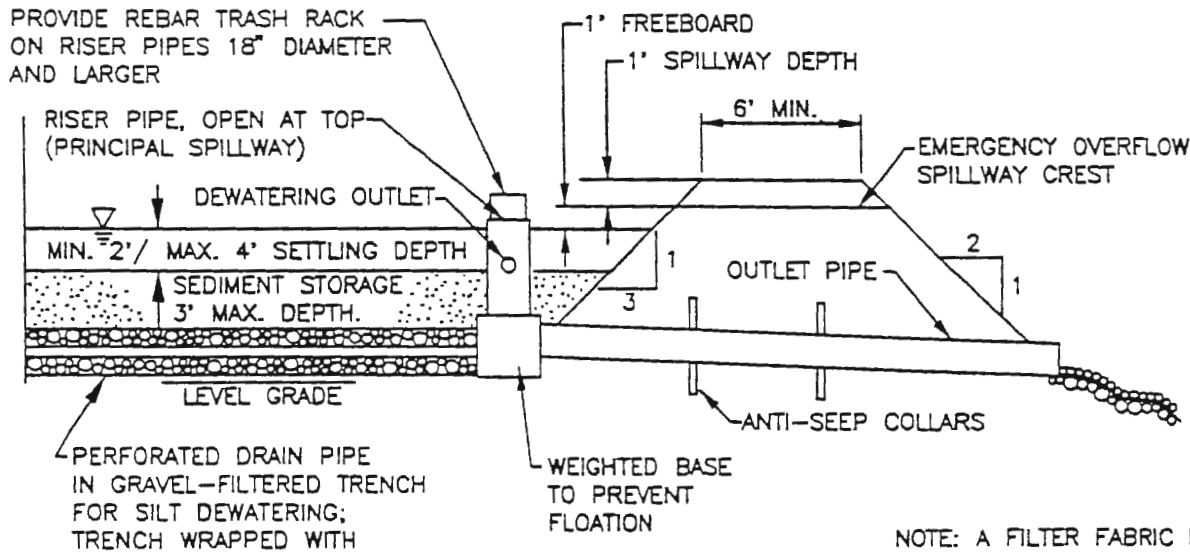
SEDIMENT TRAP OUTLET

NTS

NOTE:
A FILTER FABRIC FENCE OR SIMILIAR FILTER MUST BE CONSTRUCTED TO FILTER RUNOFF FROM THE SEDIMENT TRAP PRIOR TO DISCHARGE FROM THE CONSTRUCTION SITE.



*NOTE
SEDIMENT DEWATERING MAY BE ACCOMPLISHED WITH PERFORATED DRAIN PIPE IN TRENCH AS SHOWN OR WITH A PERFORATED RISER COVERED WITH FILTER FABRIC AND GRAVEL "CONE".



SECTION A-A

NOTE: A FILTER FABRIC FENCE OR SIMILIAR FILTER MUST BE CONSTRUCTED TO FILTER RUNOFF FROM THE POND PRIOR TO DISCHARGE FROM THE CONSTRUCTION SITE.

TECHNICAL GUIDANCE HANDBOOK	SEDIMENT POND Detail Drawing 3.13B

FILE DRAFT\INSPECTORS GRAPHICS DRAWING

Erosion Prevention BMPs

3.14 Surface Roughening

Purpose

To aid in the establishment of vegetative cover and to prevent erosion and allow for infiltration and sedimentation by reducing runoff velocity.

Conditions Where Practice Applies

A. All slopes steeper than 3:1 and greater than 5 vertical feet.

B. Any bare soil needing at least some erosion prevention measures.

Design Criteria/Specifications

There are different methods for roughening the soil surface, and the selection of an appropriate method depends on the type of slope. The major consideration when using this BMP is to develop grooves or furrows that lie perpendicular to (across) the slope. Other factors to consider are slope steepness, mowing requirements, and whether the slope is formed by cutting or filling

A. All vegetation sites require some surface roughening: stair step, grooving, furrowing or tracking.

B. Disturbed areas that will not require mowing may be stair-step-graded, grooved or left rough after filling. Areas that will be mowed (slopes<3:1) may have small furrows parallel to contour left by disking, harrowing, raking, or other grooves (across the slope) left by seed planting machinery operated on the contour.

C. Slopes steeper than 2:1 should be stair stepped with benches. Stair step grading is also particularly appropriate in soils containing large amounts of rock. Each step catches material that sloughs from above, and provides a level site to convey or detain drainage or establish vegetation. Stairs should be wide enough to work with standard earth moving or maintenance equipment (12 feet minimum with no more than 15% slope).

D. Excessive compaction of soils during scarifying should be avoided. Tracking can compact soils, reducing infiltration. Tracking with a bulldozer is the least preferred method of roughening, but is better than not roughening at all. Tracking should be done up and down the slope to leave track tread indentations across the slope.

E. Roughened soil surfaces should be seeded and mulched as quickly as possible. If conditions are not appropriate for seeding, then the area should, at a minimum, be mulched or covered with an erosion control blanket.

Maintenance/Removal Guidance

A. Roughened areas without other cover shall be inspected after every rainstorm. If grooves or stairs fill in leaving less than 1/3 of the original groove or stair depth, then the sediment shall be removed and the site re-roughened if necessary.

B. Roughening is a permanent site feature

Primary Purpose

- Reduce runoff velocity and allow for infiltration.
- Sediment trapping
- Support the establishment of vegetative cover

SHALL NOT be used:

- On site with slide or safety hazards – up to the discretion of the contractor or other site professional.

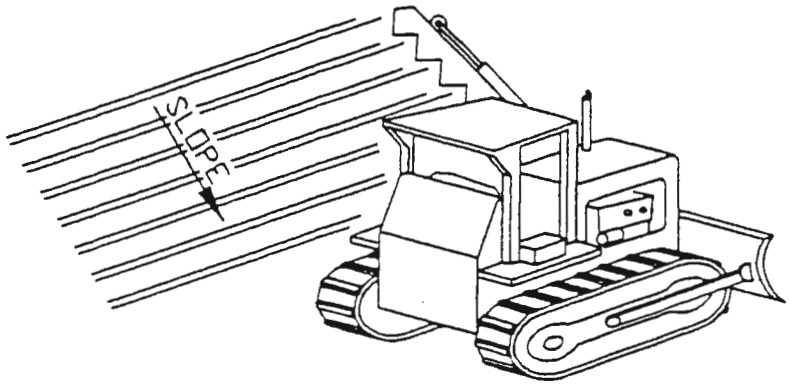
Installation Tips

- Track up and down slopes so tread furrows are perpendicular to the slope (see drawings).
- Use proper equipment for installation of furrows
- Cut furrows a minimum of 1-inch in depth.
- Avoid excessive compaction of soils.
- Control concentrated flows to slope. Divert flow away from the top of the slope.
- Tracking with bulldozer treads is the minimal acceptable practice. Other roughening forms (i.e. discing, benching, and terracing) are more effective.
- Seed and ground cover shall be in place as soon as possible and shall provide adequate cover prior to the beginning of the wet season.

Companion BMPs – mulching, vegetative cover, tackifier, and plastic sheeting.

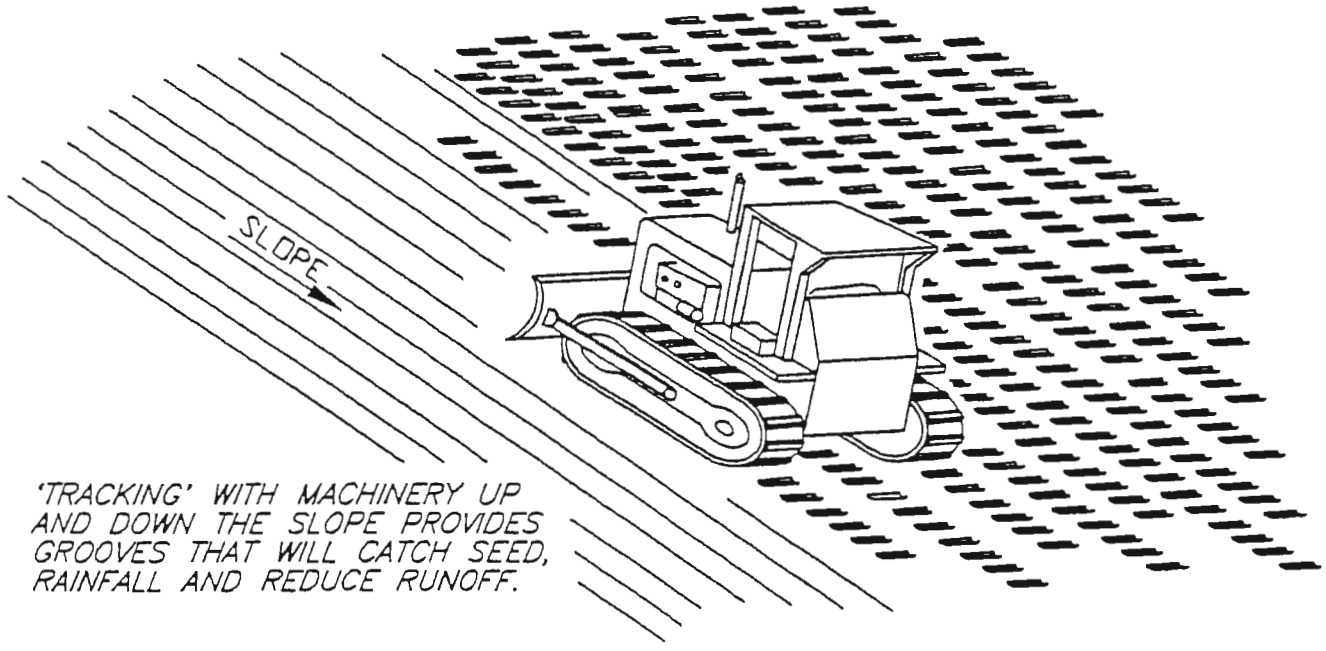
Signs of Failure

Sign of Failure	Cause	Solution
Bare Soil in Wet Season	▪ Lack of adequate cover.	▪ Mulch or appropriately cover to prevent rainfall contact.
Rill Erosion	▪ Lack of penetration of furrows. ▪ Mulch migrated.	▪ Re-grade and recover.
Slope Failure	▪ Concentration of runoff from top of slope. ▪ Groundwater emergence ▪ Unstable soils. ▪ Over compaction of soils.	▪ Provide adequate collection and conveyance system. i.e. pipe slope drain. ▪ Install trench drain to collect and infiltrate drainage. ▪ Remove and replace fill slope.



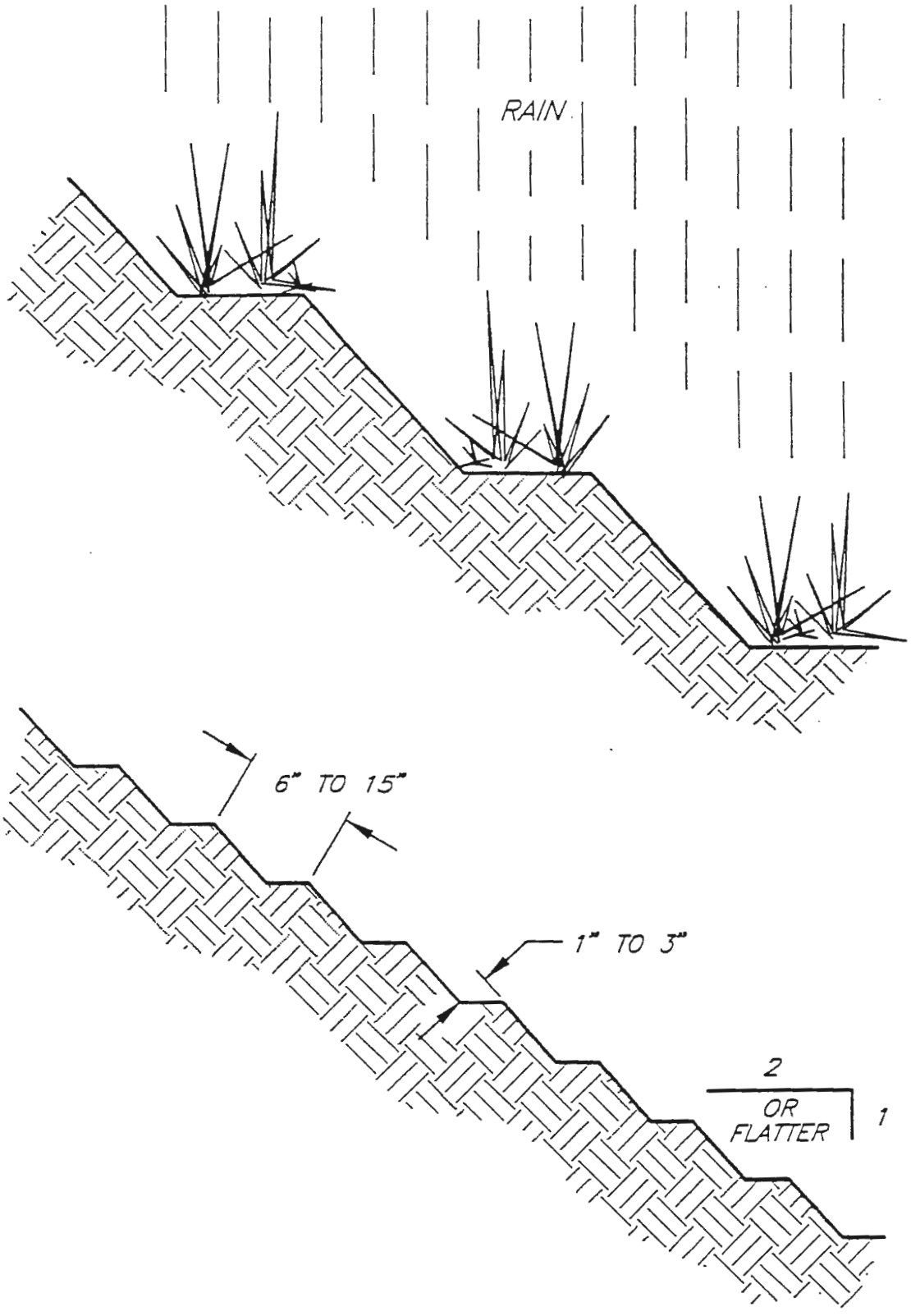
NOTE:

GROOVE BY CUTTING SERRATIONS ALONG THE CONTOUR. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER, SEED, MULCH AND FERTILIZER.



'TRACKING' WITH MACHINERY UP AND DOWN THE SLOPE PROVIDES GROOVES THAT WILL CATCH SEED, RAINFALL AND REDUCE RUNOFF.

TRACKING



NOT TO SCALE

TECHNICAL GUIDANCE HANDBOOK

GROOVED OR

3.15 Temporary Grasses and Permanent Vegetative Cover

Purpose

To reduce erosion and sedimentation by stabilizing exposed soils with vegetation ad mulching.

NOTE: Temporary establishment may differ from permanent vegetated cover (the best erosion prevention technique) but uses many of the same design and implementation principles as set out below.

Conditions Where Practice Applies

A. Ground surfaces likely to be exposed during the wet season (November 1 through April 30) or surfaces likely to be exposed for more than 3 weeks during dry season.

B. Areas that will not be subjected to heavy wear or are not working piles used by on-going construction traffic.

C. Exposed ground surfaces at end of construction period (permanent cover must be established prior to removal of any erosion control measures).

D. Temporary or permanent stabilization of new or disturbed ditches, ponds, trenches, filters or swales.

Design Criteria/Specifications: Temporary Erosion Control Grasses

A. All vegetation sites require some surface roughening: stair step, grooving, furrowing or tracking.

B. Temporary grass cover measures must be fully established by October 1 or other cover measures (mulch, blankets, etc.) will have to be implemented until adequate grass coverage is achieved. To establish an adequate grass stand for controlling erosion by October 1, it is recommended that seeding and mulching occur by September 1.

C. Soil Preparation – Topsoil should be prepared according to landscape plans, if available, or recommendations of grass seed supplier.

D. Seeding – Recommended erosion control grass seed mixes are as specified below. Similar mixes designed to achieve erosion control may be substituted if approved by jurisdiction. The designer or contractor is encouraged to use mixes of native grasses that can be incorporated into a permanent vegetative cover.

Dwarf Grass Mix (low height, low maintenance):
Dwarf Perennial Ryegrass, 80% by weight
Creeping Red Fescue, 20% by weight
Application Rate: 100 pounds per acre

Standard Height Grass Mix
Annual Ryegrass, 40% by weight
Turf-type Fescue, 60% by weight
Application Rate: 100 pounds minimum per acre

Grass	Common Name	Shade Tolerance	Seeding Rate (lbs/acre)
Tall Grasses			
Wetter			
Agrostis exerata	Spike Bentgrass		10
Beckmannia sygachne	Sloughgrass		40
Glyceria elata	Mannagrass	++	30
Glyceria occidentalis	Western mannagrass	+	30
Hordeum brachyantherum	Meadow Barley		30
Leersia oryzoides	Rice cutgrass	+	30
Drier			
Agropryon caninum var majus			40
Bromus sitchensis (including sp. Carinatus)	Sitka brome	+	40
Bromus vulgaris	Columbia brome	++	50
Elymus glaucus	Blue wildrye	+	40
Fastuca californica	California fescue		40
Trisetum canescens			50

Grass	Common Name	Shade Tolerance	Seeding Rate (lbs/acre)
Shorter Grasses			
Wetter			
Alopecurus geniculatus	Water foxtail		30
Deschampsia cespitosa	Tufted hairgrass		10
Deschampsia elongata	Slender hairgrass		10
Drier			
Danthonia califonia	California oatgrass		40
Fesuca occidentalis	Western Fescue	+	40
Fesuca rubra var rubra	Red Fescue		30
Melica geyeri	Onion grass	++	20
Melica subulata	Onion grass	++	20
Stipa occidentalis	Stipa		40

E. Seed may be applied in three differing methods:

1. Broadcast – by hand or machine, seed is scattered on the soil surface. Mostly used for smaller areas.

2. Hydroseed – applied as a mixture of water, seed, and sometimes fertilizers or mulch, this mixture is sprayed onto exposed soils. Best for sites over 5,000 square feet in size.

3. Drilled – seed is tracked down by equipment to inject seeds into exposed soils. Best for sites greater than 2 acres.

F. Fertilization for grass seed only as needed or specified in accordance with supplier's recommendations. Development areas within 50 feet of water bodies and wetlands must use a non-phosphorus fertilizer.

G. Mulch shall be spread uniformly immediately following seeding. Dry, loose, weed free straw used as mulch shall be applied at double the hydromulch application requirement (4000 lb./acre). Anchor straw by working in by hand or with equipment (rollers, cleat tracks, etc.)

H. Hydromulch shall be applied with grass seed at a rate of 2000 pounds per acre or as specified by supplier. On slopes steeper than 1%, hydroseed and mulch shall be applied with a bonding agent (tackifier). Application rate and methodology to be in accordance with seed supplier recommendations.

I. Netting and Anchors, as needed – For disturbed areas on slopes and in ditches/swales, erosion control blankets, biodegradable netting or jute is desirable

and may be used instead of bonding agents to provide a stable area for seeding. Netting should be anchored in accordance with manufacturer's recommendations.

J. Watering – Seeding shall be supplied with adequate moisture to establish grass. Supply water as needed, especially in abnormally hot or dry weather or on adverse sites. Water application rates should be controlled to provide adequate moisture without causing runoff.

K. Re-seeding – Areas which fail to establish grass cover adequate to prevent erosion shall be re-seeded as soon as such areas are identified and all appropriate measures taken to establish adequate cover.

Maintenance/Removal Guidance – Permanent Vegetative Groundcover

A. At the end of site construction, approved permanent site landscaping or establishment of a healthy stand of grass (or alternative vegetation as approved) must occur prior to removal of site erosion control measures.

3.16 Mulch

Definition

Mulch is a name given to a group of organic and inorganic (natural or synthetic) materials that are spread on the soil surface to prevent movement of soil by wind and rain. Mulches slow downslope flow, increase heat and moisture content for seeding and other vegetation, and when adequately anchored can provide slope stabilization.

Purpose

To prevent erosion by providing a protective cover over disturbed, bare or reseeded soils. Also is best used to enhance success of seeding/revegetation. Thicker layers are more effective.

Conditions Where Practice Applies

A. As a cover on ground surfaces and stockpiles exposed during the wet season (November 1 through April 30).

B. As a mulch to enhance vegetation establishment in areas that have been seeded.

Conditions Where Practice Does Not Apply

A. On slopes steeper than manufacturer or supplier guidelines.

B. No organic mulches shall be used on streams or water quality/quantity facility banks below high water line.

Design Criteria/Specifications

A. All materials shall be loose, weed-free and free of significant sediment loads

B. Mulches shall be spread uniformly throughout the entire area and integrated into the top layer of soil – if appropriate.

C. Mulches are most effective when anchored. Anchoring can include punching materials into the soil, mixing mulches with tackifier products, or covering with adequately anchored netting or blankets.

D. Organic mulches must be stabilized in place by hand or machine punched into the soil, spraying it with a tacking agent, or covering it with an erosion blanket or other netting. See Section 3.3.8 " Erosion Blankets" for appropriate design criteria for such coverings.

E. Mulches shall be applied at the rates specifies in the following Mulch Comparison Matrix.

Maintenance/Removal Guidance

A. Additional mulch applications shall be made when the current mulch layer has migrated or is no longer uniform depth.

B. Mulches may be left in place permanently – either as part of the final landscaping plan or integrated into the topsoil as a soil amendment.

Mulch Application Rates and Notes

Mulch Material	Specific Standards	Min. Application Rate (Volume)	Min. Application Rate (Weight)	Min. Depth of Application	Considerations
Straw (or Hay)	▪ Air Dried ▪ Free from seeds and coarse material	90-100 lbs (2-3 bales)	2 – 2 1/2 tons (80-130 bales)	2-in. minimum	▪ May be windblown or moved by flows – need to be anchored.
Compost	▪ Well composted ▪ Free of coarse foreign matter (plastics, metal, etc.) ▪ Size dependent on use.	9 yds. (3 cy)	400 yds. (120 cy)	2 in. minimum	▪ Courser grades from more erosion prone areas. ▪ Finer grades may be windblown ▪ All grades good for landscaping and as a soil amendment. ▪ Durability dependent on grade and type of compost.
Wood Chips	▪ Green or air-dried ▪ Free of coarse material	3-9 yds (2-3 cy) 185-275 lbs	130-400 yds (40-120 cy) 4-6 tons	1-3 in.	▪ Durable, but subject to movement on >6% slopes. ▪ Add 12 lbs organic compost or nitrogen fertilizer per ton of chips. ▪ Not for use in fine turf areas ▪ Apply with mulch blower, chip handler or by hand.
Bark Chips/ Shredded Bark	▪ Air Dried ▪ Free of coarse matter	3-6 yds (1-2 cy)	150-280 yds (50-70 cy)	1-3 in,	▪ Durable, but subject to movement on 6 % slopes. ▪ Typically used in areas of permanent landscaping. ▪ Not for use in fine turf areas. ▪ Apply with mulch blower, chip handler or by hand.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wood or Cellulose Fiber	▪ Dyed visible color ▪ Should contain no growth inhibiting factors.	25-35 lbs	1500-2000 lbs.	N/A	▪ Apply with hydromulcher or with hydroseed. ▪ Second application in different direction to avoid shadowing. ▪ Double application rate, in two layers, on critical areas. ▪ Use tackifer as recommended by manufacturer. ▪ Do not use in hot/dry weather. ▪ Packaged in 100 lb bags.
Crushed Rock	• 1 ½ inch fractured face rock. • Clean, with less than 10% fines	12 tons	410 tons	1-2 in	• Use of landscape rock in permanent landscape areas.

Primary Purpose

- To prevent erosion from exposed soils.

SHALL NOT be used:

- On slopes steeper than manufacturer's recommendation.
- No organic mulches on stream or water quality/quantity facility banks.

Installation tips

- Complete required grading and roughen underlying surface (see page ___) prior to application of mulches.
- Use in conjunction with a perimeter sediment control barrier.
- Disc, punch, or use other approved anchoring method to bind mulches to the soil.
- Assure 2-inch uniform across entire site.

Signs of Failure

Signs of Failure	Cause	Solution
Silt in Road	▪ Mulch has gone bare or is no longer 2"-inch uniform thickness. ▪ Mulch has migrated from site.	▪ Clean up migrated mulch. ▪ Add more mulch. ▪ Disc or punch in.
Soil Migration Off Site	▪ Mulch has gone bare or is no longer 2-inch uniform thickness.	▪ Clean up migrated soil. ▪ Repair in rills or gullies. ▪ Recover with alternative material – i.e. blanket, tackifier, plastic sheeting or other approved measure.

3.17 Erosion Blankets

Definition

Erosion control blankets are mats comprised of organic fibers or inorganic materials held by synthetic or biodegradable netting. Most blankets are rolled products, but some may be sprayed onto exposed soils.

Purpose

To provide immediate protection and physical stabilization of disturbed soils. Typically used when vegetative cover cannot be achieved due to soils, slopes or time of year, or where slopes are too steep for mulch or other erosion prevention BMPs. Can be used to enhance success of seeding, planting and/or sodding.

Conditions Where Practice Applies

A. As channel stabilization against concentrated runoff flows.

B. On areas of steep slopes (greater than 50%) and areas of moderate slopes that are prone to erosion.

C. As a cover on ground surfaces exposed during the wet season (October 1 through April 30).

D. As supplemental aid to seed and/or mulch treatment on slopes or in ditches or swales.

Conditions Where Practice Does Not Apply

A. No blanket product shall be installed outside of manufacturer specifications.

Design Criteria/Specifications

A. Erosion blankets may be used on level areas and on slopes up to 1:1. Where soil is highly erodible, netting shall only be used in conjunction with an organic mulch such as straw or wood fiber. The blanket must be applied so that it is in complete contact with the soil; if it is not, erosion will occur beneath it. Erosion blankets shall be securely anchored to the slope in accordance with manufacturer's recommendations.

B. Deformed plastic filament matting may be used for stream velocity protection and other special applications when approved by the jurisdiction.

Primary Purpose

- To prevent erosion from exposed soils in channel on slopes, or as a wet weather measure.

SHALL NOT be used:

- On slopes steeper than manufacturer's recommendation
- On rough surface projects where there is not good contact with the ground.

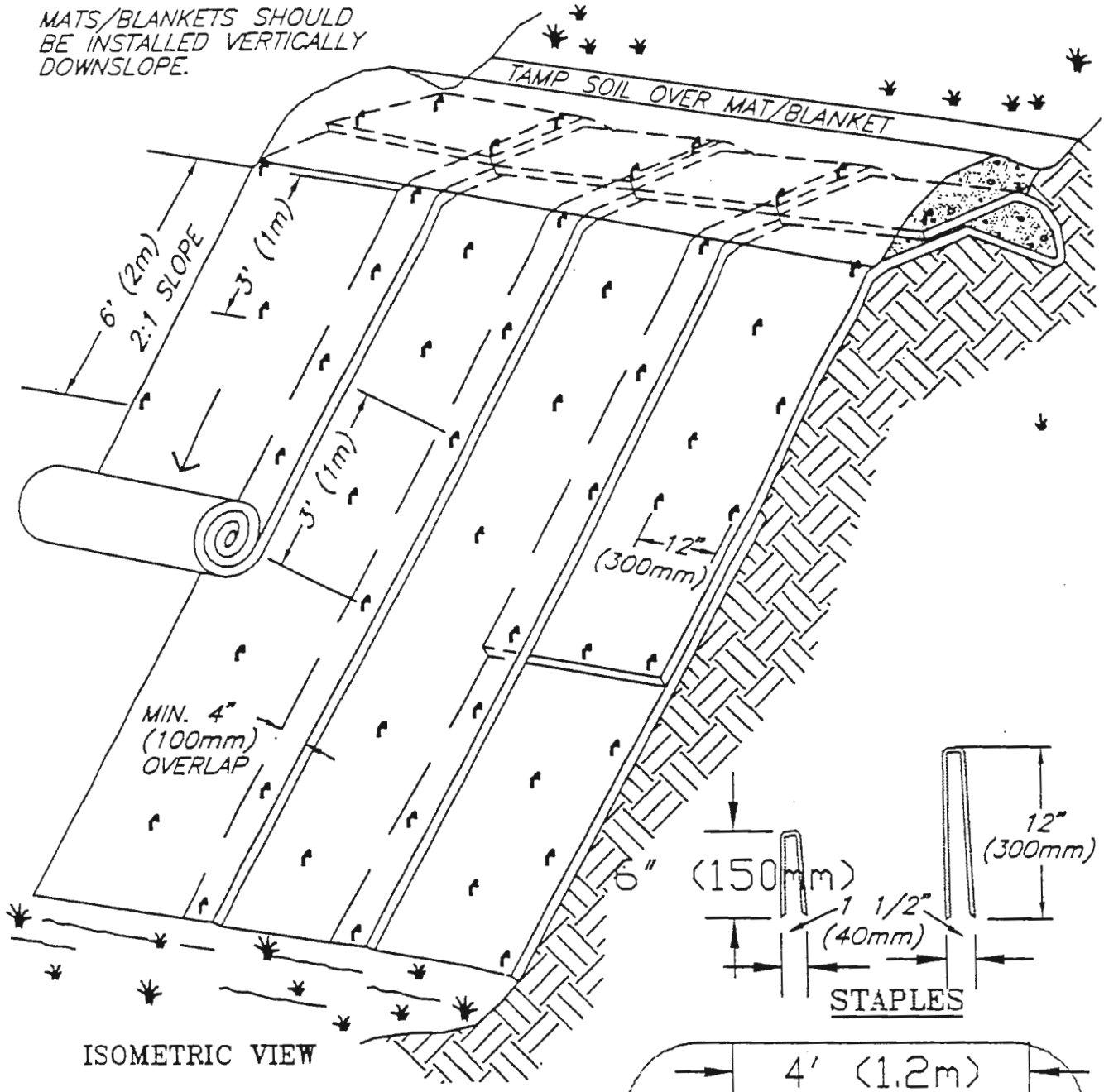
Installation Tips

- Best used for slopes over 2:1 down to 4:1.
- Be sure to use adequate material for overlaps and in trenches.
- Install horizontally across slopes, with overlap of upper blanket over lower blanket.
- Organic and/or thicker materials will provide protection of soils.

Signs of Failure

Signs of Failure	Cause	Solution
Blanket Moved or Deformed	▪ Improperly or inadequately staked. ▪ Joints not properly overlapped or secure. ▪ Concentrated flows are directed into joint or weak stapled areas.	▪ After adequately repairing erosional damage under blanket. ▪ Adjust and re-anchor mat. ▪ Control or reduce upstream flows.
Slope Creep/Undermining	▪ Blanket not making good contact with soils. ▪ Flows directed under blanket edge. ▪ Groundwater or slope failure issue.	▪ After adequately repairing erosional damage under blanket. ▪ Add additional stakes to have blanket conform to contours of soils. ▪ Assure edges are anchored under incoming flows (in trench, under outfall, etc.) ▪ Have Geotech check slope stability.

Sign of Failure	Cause	Solution
Erosion Occurred	▪ Flows too high for type of blanket used. ▪ Blanket not secured.	▪ After adequately repairing erosional damage under blanket. ▪ Choose blanket rated to withstand site flows. ▪ Re-anchor blanket.



ISOMETRIC VIEW

TYPICAL SLOPE SOIL STABLIZATION

NOTES:

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

NOT TO SCALE

3.18 Plastic Sheet Covering

Purpose

To provide immediate erosion protection, for usually small areas, where vegetative cover cannot be achieved due to soils conditions, steep slopes, or time of year. To provide temporary erosion protection on soils, spoils, and other erodible stockpiles.

Conditions Where Practice Applies

A. Disturbed areas which require immediate protection.

B. On steep slopes (greater than 50%) and areas of moderate slopes that are prone to erosion.

C. On disturbed ground surface and stockpiles exposed during wet weather season (November 1 through April 30).

Design Criteria/Specifications

A. Plastic sheeting shall be polyethylene and have a minimum thickness of 6 mil.

B. Covering shall be installed either overlapping side to side or top to bottom. Sheeting shall be maintained tightly in place by using staples, stakes, sandbags, 12-inch-diamter rock, cinder blocks or other rough surface materials. The top of the sheeting shall be laid into a small trench and then backfilled with dirt to prevent runoff from getting under the sheeting. Sheeting should be applied as a continuous sheet whenever possible. All seams shall be taped, appropriately welded, or weighted down for the full length and there shall be at least a 12-inch overlap of all seams. For seams parallel to the slope contour, the uphill sheet shall overlap the downhill sheet. For seams crossing up and down slope, sheet shall be laid so that the top sheet faces from any prevailing wind. No runoff shall be allowed to run under the plastic covering.

C. Collection trenches shall be placed at the top and around the base of any stockpile or other area using sheeting. The top trench shall direct waters away from the sheeting to an appropriate collection and conveyance system (i.e. pipe slope drains or swales). The anchoring trench may be designed and used to assist in conveyance as well as anchoring. The bottom trench shall be sized and stabilized to adequately route and control flows from the sheeting surface. Drainage from areas covered by plastic sheeting shall be controlled such that no discharge occurs directly onto uncontrolled, disturbed areas of the construction site.

D. All sheeting shall be reused or disposed of properly after it has served its purpose.

Maintenance Guidelines

A. Plastic sheeting should be visually inspected every two weeks and after every storm for tears or weak points.

Primary Purpose

- Protect soils from contact with water.

SHALL NOT be used:

- As a first choice for erosion prevention cover. Erosion control matting, mulch or seeding is preferred.

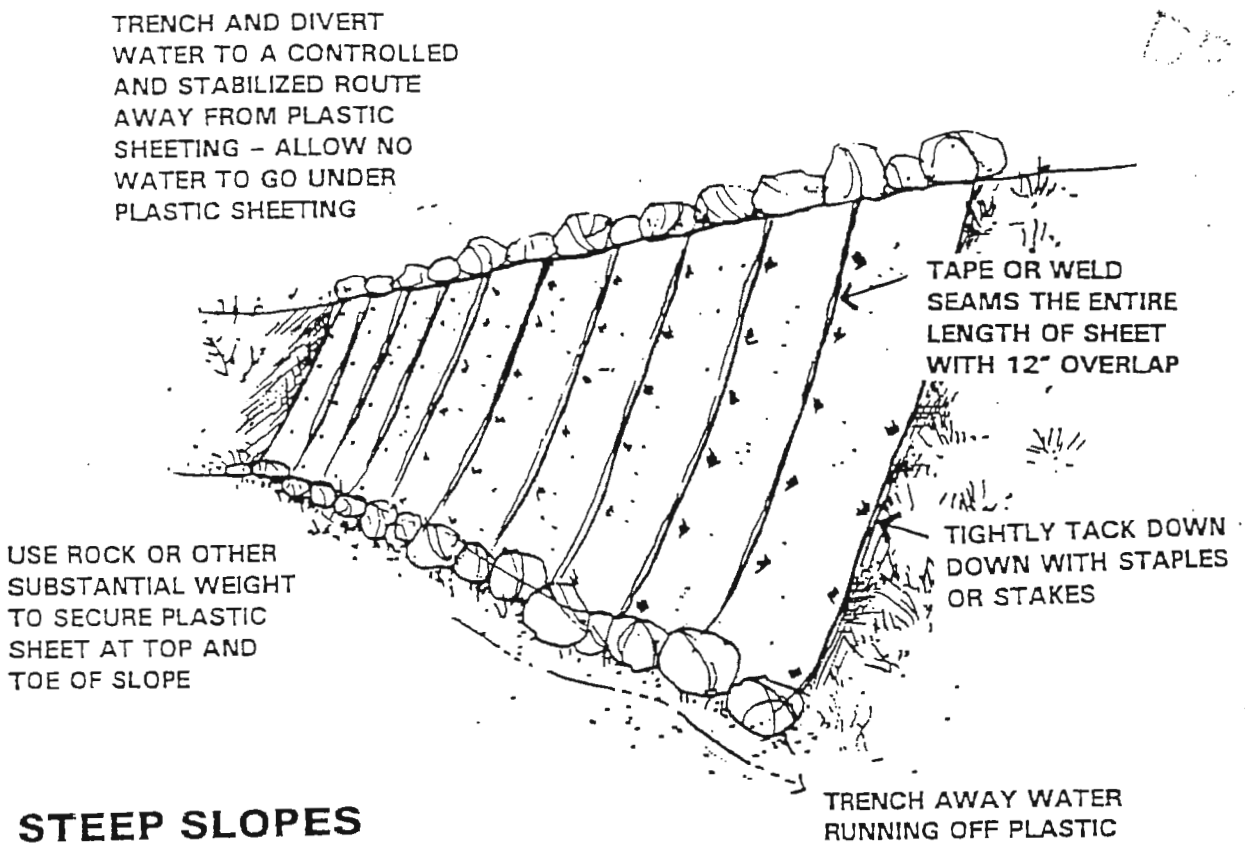
Installation Tips

- Apply in a continuous sheet covering pile.
- Secure edges tightly. Inspect weights frequently to assure plastic stays in place.
- Maintain and adequately size drainage trenches to carry flows generated by the plastic.
- Check seams and material condition often.
- Soils under plastic may go anaerobic, killing various organisms that make soil healthy. Consider grass cover to hold soils and improve soil health.

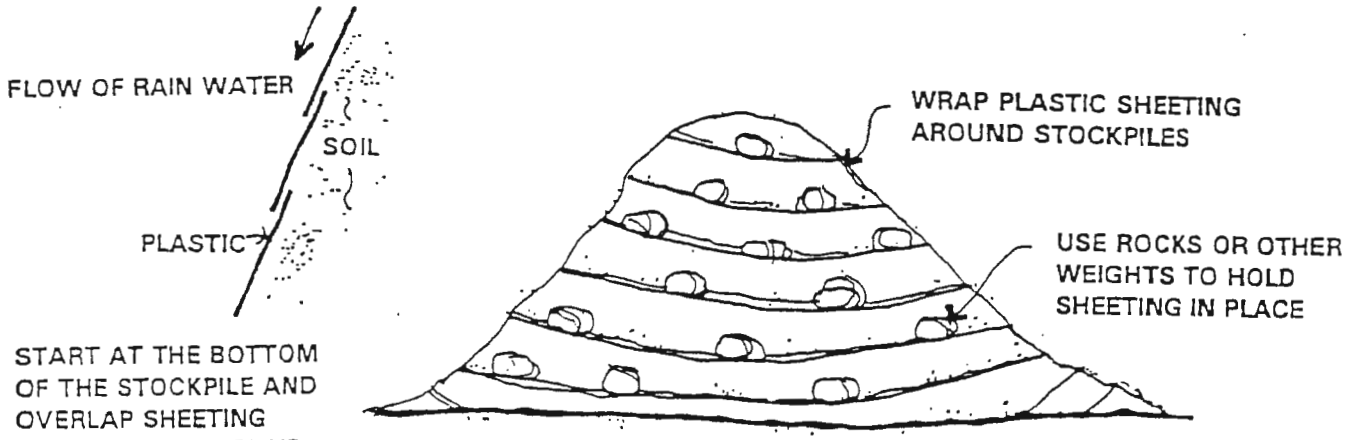
Preferred BMPs – mulching, vegetative cover ,tackifier

Signs of Failure

Signs of Failure	Cause	Solution
Seems Split/Fabric Tear	▪ Too much weight strain. ▪ Inadequate overlap or weld. ▪ Wind shear.	▪ Adjust plastic layers and anchoring, choosing more and lighter anchoring materials. ▪ Weld seams appropriately. ▪ Cover with duct tape or additional plastic.
Fabric Blown Off/Bare Soils	▪ Wind shear.	▪ Replace plastic and add extra anchoring.



STEEP SLOPES



STOCKPILES

3.19 Dust Control

Purpose

To prevent wind erosion of bare soils

Conditions Where Practice Applies

A. Bare soils exposed to wind, especially unpaved roads, stockpiles and soil tracked onto paved roads or other impervious surfaces.

Design Criteria/Specifications

Dust is formed when bare soils come into contact with the wind. The following measures are ordered to start with prevention and then move to stricter controls.

A. Administrative Control Methods. These methods concentrate on preventive controls such as: traffic restrictions/speed limits, reducing work activities with increasing wind speeds, enclosing bulk soil, and enclosing soil movement operations.

B. Structural and Mechanical Control Methods. These methods concentrate on actions taken to reduce exposure during site work operations. Options include: tilling soil into big clumps with fewer fines that are easily moved by air; installing or maintaining vegetative or structural barriers (especially on the windward side of site); street sweeping of paved surfaces to remove tracked soil; preservation of perimeter trees and a vegetated buffer (especially on the windward side of the site); and application of mulches to exposed soils.

C. Water is the wetting agent of choice to be used on soils to resist wind erosion. Assure that spray types and flow volumes and rate do not cause soil to wash off.

D. Chemical Control Methods. When other methods fail, the site may require application of control substance. Options include tackifier mixtures to bind soil or application of other binding agents (see following table).

Binding Agents for Dust Control

Agent	Dilution Ratio (Agent:Water)	Nozzle Type	Application Rate (gals per acre)
Latex Emulsion	12.5:1	Fine Spray	235
Resin in Water	4:1	Fine Spray	300
Acrylic Emulsion (traffic)	3.5:1	Coarse Spray	350
Acrylic Emulsion (non-traffic)	7:1	Coarse Spray	450
Anionic Asphalt Emulsion	7:1	Coarse Spray	1200

Armoring BMPs

3.20 Reinforced Soil Retaining Systems

Definition

Reinforced soil retaining systems are a mixture of permanent BMPs including hinged block, grid containment and articulated armoring systems. These products are usually preformed structural systems that are laid atop soils and then backfilled with a variety of materials – usually concrete, soil, sand, or planted with vegetation. While they can be more expensive than other treatments, ease of installation and permanency can make these systems desirable.

Purpose

To provide erosion protection and stabilization for slopes, including streambanks. Best used under high flow or unstable soil conditions.

Conditions Where Practice Applies

A. Slope stabilization and streambank protection projects.

B. Channel stabilization or outfall armoring projects.

NOTE: Bioengineering techniques are preferred for low flow waterway conditions.

Design Criteria/Specifications

A. All materials should be installed per manufacturer's guidance and shall be designed by a licensed professional when required by the permitting authority. In general, a licensed professional should be consulted for high flow, steep slope or poor soil conditions.

B. Excavate the application area to a depth to assure that the reinforced soil retaining system will be flush or slightly lower than adjacent terrain. The exposed surface shall be leveled and free of minor obstructions such as stones and debris. Major obstructions can be left in place, with materials established around them. Soils shall be compacted or removed as necessary.

C. Lay panels or sheets on exposed surface. Use appropriate pins, hinges, staples, hog rings or overlapping suggested by the manufacturer. Trench in top, bottom or sides of panel or sheets as specified by the manufacturer.

D. Anchor reinforced soil-retaining systems as per manufacturer's instructions. Anchoring shall at least occur along slope crests, upstream system edges, steep areas and areas likely to experience the highest turbulence from nearby surface water systems.

E. Fill systems with material of choice – as rated for the system selected. Consider using some element of vegetative cover to enhance aesthetics and provide habitat.

Maintenance/Removal Guidance

Reinforced soil retaining systems are primarily used as permanent site features. All systems shall be maintained as installed for the life of the BMP. System repair typically consists of additional anchoring or refilling of sections on an as needed basis.

Primary Purpose

- To provide permanent slope stabilization or armoring.
- To protect system channels or outfall locations.

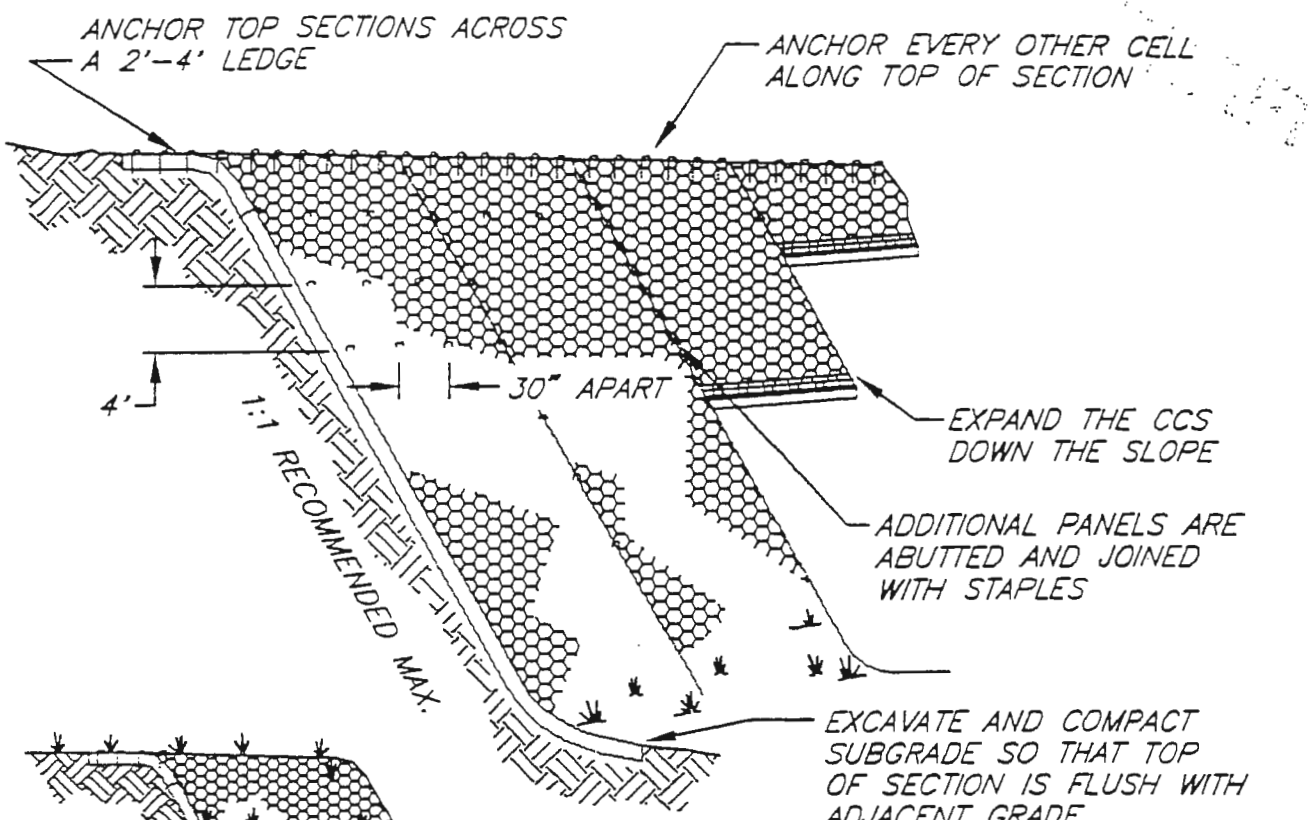
NOTE: Bioengineering techniques are preferred for low flow, waterway sites.

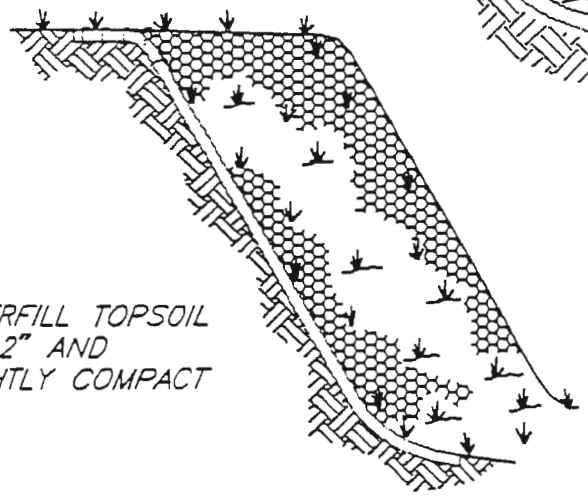
Installation Tips

- Make sure there is a good foundation with adequately compacted soils.
- Adequately anchor – especially on slope crests, upstream edges and other areas with steep slopes or high velocity flows.
- Consider overseeding or otherwise planting systems to enhance appearance and performance.

Signs of Failure

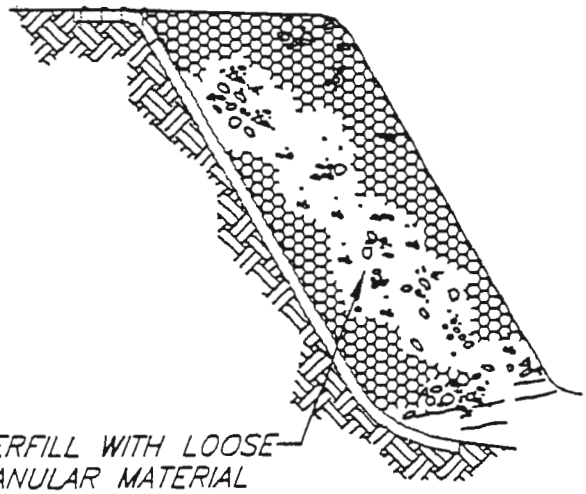
Sign of Failure	Cause	Solution
System is broken or otherwise compromised	▪ Flow is too intense. ▪ Materials are weak.	▪ Revisit flow calculations. ▪ Add additional material supports or fill support materials. ▪ Overseed or overplant with vegetation to help hold in fill material.
System has slid or been displaced	▪ Foundation was insufficiently compacted and the slope slipped. ▪ System was not adequately anchored.	▪ Reestablish slope, compact and reinstall system. ▪ Replace and add additional anchors to system.
Erosion Occurred	▪ Flows too high for type of system used. ▪ Flows are undermining system. ▪ Fill materials are missing.	After adequately repairing erosional damage under or within the system: ▪ Choose system rated to withstand site flows. ▪ Replace and/or reanchor system. ▪ Add additional fill as necessary. ▪ Overseed or otherwise vegetate system to hold fill material.





CCS INFILLED WITH TOPSOIL AND VEGETATED WITH GRASS

CCS INFILLED WITH AGGREGATE



NOTES:
1. SURFACE OF SLOPE SHALL BE LEVELED WITH GULLIES FILLED AND WELL COMPACTED.
2. SHAPE AND COMPACT SUBGRADE SURFACES TO DESIGN ELEVATIONS AND GRADES.
3. THE CELLS SHALL BE ANCHORED SECURELY TO PREVENT DISPLACE– MENT AND DEFORMATION OF PANELS WHEN BACKFILLING.
4. INFILL FROM CREST OF THE SLOPE TO TOE TO PREVENT DISPLACEMENT. LIMIT DROP HEIGHT TO 3'.

NOT TO SCALE

3.21 Gabions

Definition

Gabions are wire mesh baskets or bags used for semi-permanent or permanent slope protection and stabilization. These rock-filled devices are pervious, semi-flexible building blocks that can be used as retaining walls for structure to support all types of vegetation, especially live stakes. In addition, gabions and sack gabions can be used as check dams for water conveyance systems.

Purpose

To provide erosion protection and stabilization for slopes, including streambanks. They can also be used as energy dissipaters to slow flow and provide sedimentation.

Conditions Where Practice Applies

A. Slope stabilization and streambank protection projects.

B. Channel stabilization or outfall armoring projects.

NOTE: Bioengineering techniques are preferred for low flow waterway conditions.

Design Criteria/Specifications

A. Gabions can come as boxy baskets, thinner mattresses, or as sacks. Each type is typically constructed of 3-1/4- by 4-1/2-inch opening, double twisted or welded, hexagonal zinc wire mesh. Gabions are typically filled with four 7-inch or five 9-inch gabion rock. Alternative mesh opening sizes are available. Some gabions can also come with a PVC coating to protect from zinc flaking or rusting off gabions. Gabions can use one-third the thickness of a rip-rap layer to provide the same protection.

NOTE: PVC or other approved coating will be required for gabion used in streams, storm water management facilities or other waterbodies.

B. Unfold and assemble gabion into proper dimension by tying edges with lacing wire or other approved fasteners. Include proper installation of mid-height form wires as appropriate (form wires may also be added during filling).

C. Excavate the location for gabion use. Key any basket or mattress at least 12 feet into the foundation area and side slopes of the work area or streambank. Follow manufacturer's instructions.

D. Place empty gabions into excavated area, stretching gabions as needed for proper alignment or connection. Tightly tie gabions together on the side as needed.

E. Fill gabions, typing form wires as needed. When basket or mattress is full, tie lid shut. If additional layers are used, new gabions shall be secured to the underlying gabion layer.

Maintenance/Removal Guidance

Gabions, outside of sack gabions, are primarily used as permanent site features. All gabions shall be maintained as installed for the life of the BMP. Gabion repair typically consists of typing holes closed in the mesh structure when needed.

Primary Purpose

- To provide permanent slope stabilization or armoring.
- To act as a check dam providing energy dissipation and sedimentation.

SHALL NOT be used:

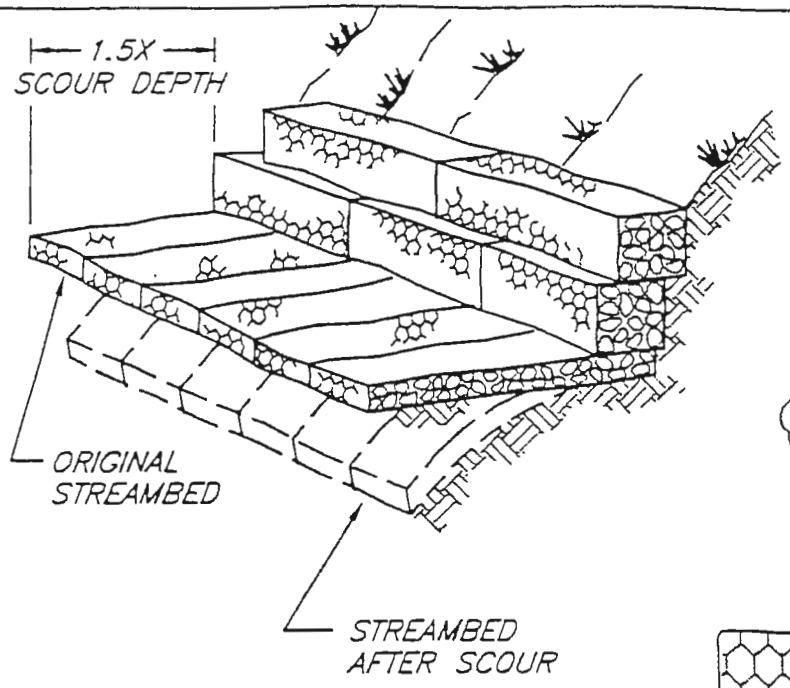
- In streams, storm water facilities and other waterbodies, unless they are coated with PVC or other appropriate material.

Installation Tips

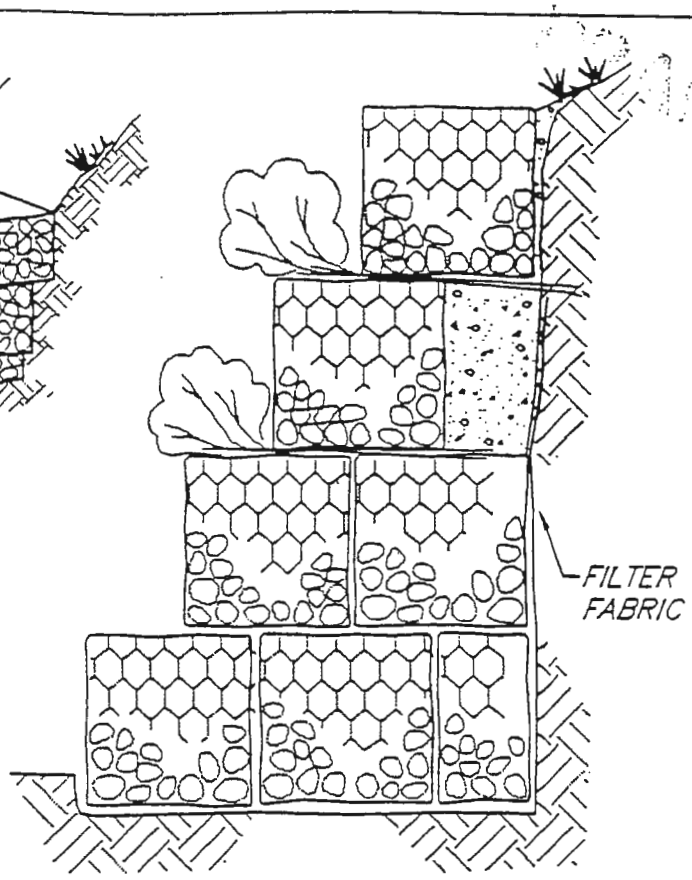
- Make sure there is a good foundation. Consider use of a gravel base course, especially where used as retaining wall systems.
- Adequately key into foundation and side slopes, at least 12-foot or as per manufacturers or engineer's instructions.
- Consider overseeding or otherwise plant gabions to enhance appearance and performance.

Signs of Failure

Sign of Failure	Cause	Solution
Gabion wires are broken	▪ Flow is too intense. ▪ Mesh is weak.	▪ Revisit flow calculations. ▪ Add additional wire supports or ties to mesh. ▪ Overseed or overplant with vegetation to help hold in rock.
Gabion has displaced	▪ Foundation was insufficient. ▪ Gabion was not adequately keyed into side slopes. ▪ Wire ties have broken or are missing.	▪ Re-intrench gabion into foundation or key into side slopes. ▪ Add additional wire supports or ties to mesh.

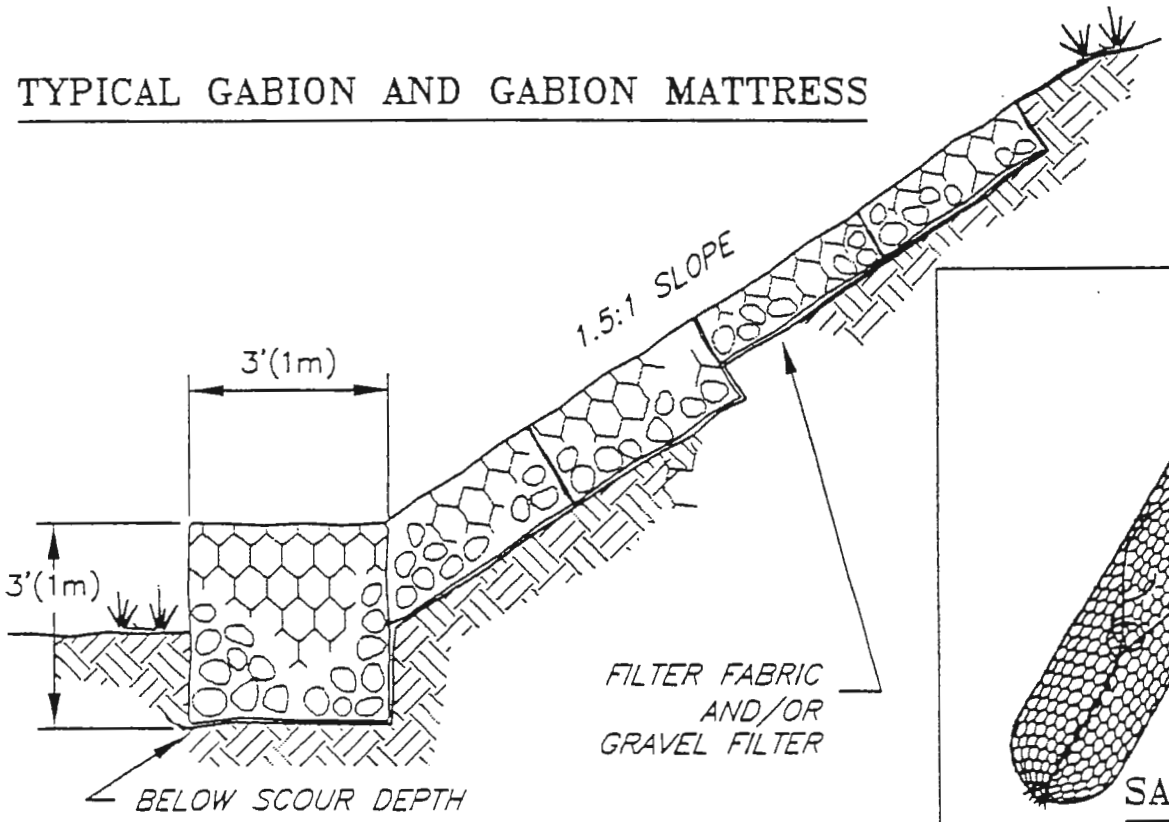


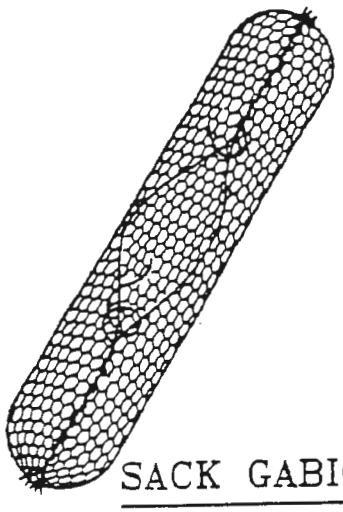
TYPICAL GABION APRON



TYPICAL VEGETATED ROCK GABION

TYPICAL GABION AND GABION MATTRESS





SACK GABION

Bioengineering BMPs

3.22 Live Stakes

Definition

Live stakes are living, woody plant cuttings capable of rooting with relative ease and intended to grow into mature shrubs that will hold and cover soil. Stakes are cut large enough and long enough to be tamped into the ground.

Purpose

To act as an effective system for securing natural geotextiles such as jute mesh, coir or other blanket surface treatment; while intended to root and grow into mature shrubs that, over time, will serve to stabilize the soils and restore the riparian zone habitats. They offer no immediate erosion control.

Conditions Where Practice Applies

A. Streambank restoration or construction projects.

B. Slope stabilization projects.

Design Criteria/Specifications

A. Grade slopes to appropriate slope – preferably 2H to 1V.

B. Use healthy, straight, and live wood that is at least one year old, with side branches removed, and with bark intact. They must be taken from species that root easily from cuttings, such as willow or other native species approved by the local jurisdiction.

C. Cuttings shall be prepared from ½- to 3-inch-diameter stock and work best when they are 1½ to 3 feet in length. The butt ends shall be cut cleanly at an angle to facilitate easy insertion into the soil. The top shall be cut square or blunt for tamping.

D. Cuttings shall be fresh and must be kept moist after they have been prepared into appropriate lengths. It is suggested that they are soaked 24 hours prior to installation.

E. The cuttings shall be tamped into the ground at right angles to the slope and angled down stream. They shall be tamped into the ground carefully for approximately 4/5 of their length. Two to 5 bud scars should remain above the ground surface. Remove any additional length above ground. Stakes shall be placed in a random configuration from 1 to 3 feet apart to prevent gullies from forming and to produce a more natural effect in the revegetation area.

Primary Purpose

- To secure streambanks or slope erosion prevention materials.
- To provide long-term permanent streambank or slope cover.

SHALL NOT be used:

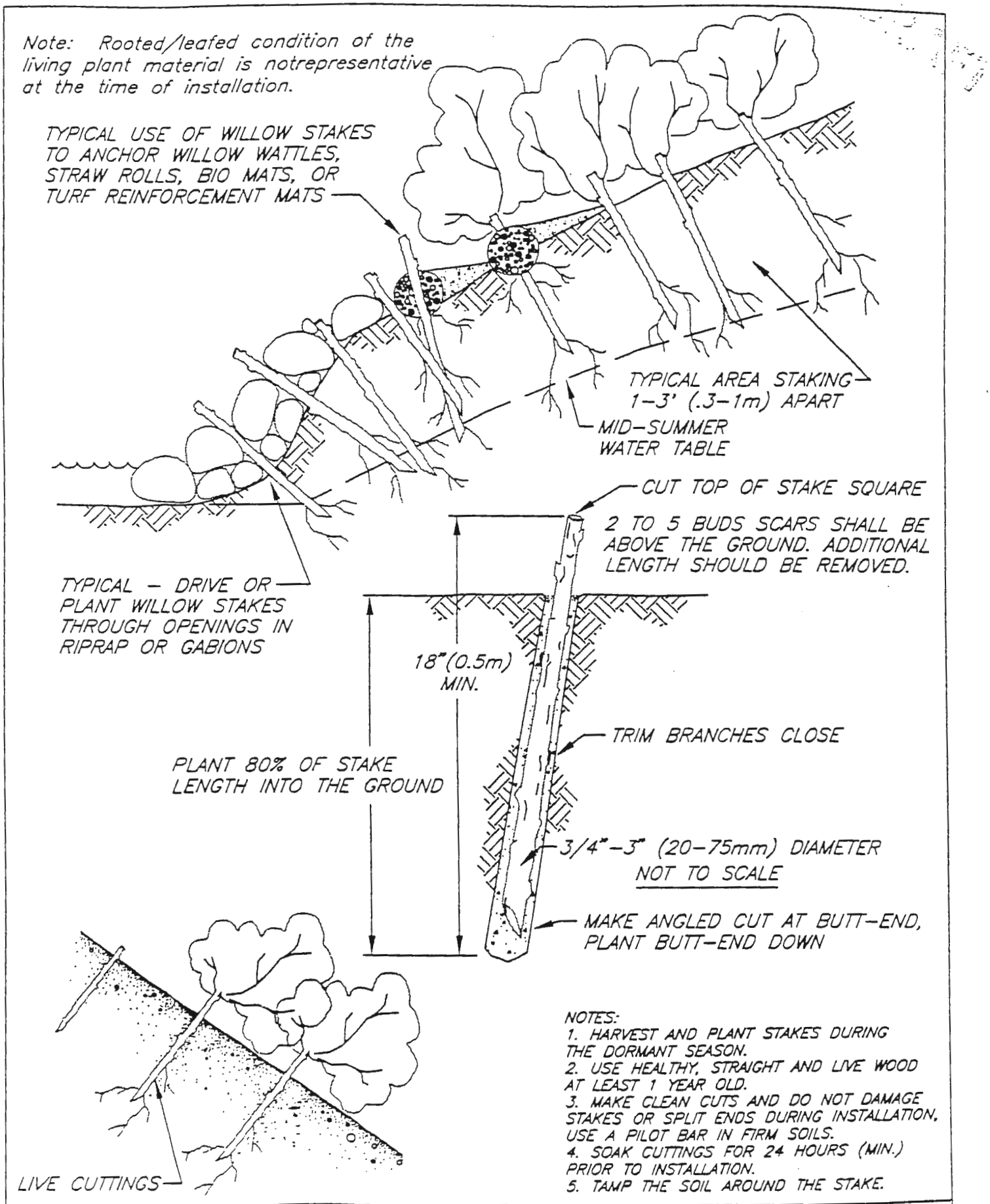
- By itself for immediate erosion control protection.

Installation Tips

- Harvest and plant stakes during the dormant season of the vegetation used.
- Make clean cuts and try not to split ends during installation.
- Use a saw for cuts rather than an ax – there is less chance for bark damage.
- Use a pilot bar or other tool to pre-drill holes in firm soils.
- Determine whether temporary irrigation will be needed to establish growth.
- Assure soil is adequately worked in around stake.

Signs of Failure

Sign of Failure	Cause	Solution
Stake has dislodged or is gone	▪ Stake was not installed to correct depth. ▪ Soil was not adequately packed around stake – tamping it in.	▪ Replace missing stakes with adequate soil tamping.
Stakes are not growing	▪ Lack of contact with soil. ▪ Stakes are dead.	▪ Re-bury or replace, adding water and nutrients if needed.
Soil is running off bank or slope	▪ Stakes used by themselves for erosion control.	▪ Protect soils with blankets, mulches or other covers or overseed to provide for temporary vegetative cover.


Note: Rooted/leafed condition of the living plant material is notrepresentative at the time of installation.
TYPICAL USE OF WILLOW STAKES TO ANCHOR WILLOW WATTLES, STRAW ROLLS, BIO MATS, OR TURF REINFORCEMENT MATS
TYPICAL AREA STAKING 1–3' (.3–1m) APART
MID–SUMMER WATER TABLE
CUT TOP OF STAKE SQUARE
2 TO 5 BUDS SCARS SHALL BE ABOVE THE GROUND. ADDITIONAL LENGTH SHOULD BE REMOVED.
TYPICAL – DRIVE OR PLANT WILLOW STAKES THROUGH OPENINGS IN RIPRAP OR GABIONS
18"(0.5m) MIN.
TRIM BRANCHES CLOSE
PLANT 80% OF STAKE LENGTH INTO THE GROUND
3/4"–3" (20–75mm) DIAMETER
NOT TO SCALE
MAKE ANGLED CUT AT BUTT–END, PLANT BUTT–END DOWN
LIVE CUTTINGS
NOTES:
1. HARVEST AND PLANT STAKES DURING THE DORMANT SEASON.
2. USE HEALTHY, STRAIGHT AND LIVE WOOD AT LEAST 1 YEAR OLD.
3. MAKE CLEAN CUTS AND DO NOT DAMAGE STAKES OR SPLIT ENDS DURING INSTALLATION. USE A PILOT BAR IN FIRM SOILS.
4. SOAK CUTTINGS FOR 24 HOURS (MIN.) PRIOR TO INSTALLATION.
5. TAMP THE SOIL AROUND THE STAKE.

3.23 Live Fascines

Definition

Live fascine structures are sausage-like bundles of live cut branches of wetland / streamside materials, usually willows. These bundles are placed into trenches along the streambank and grow out perpendicular to the bank providing protective vegetative cover and solid root structure to stabilize banks.

Purpose

To provide surface stability ad prevention of erosion by holding soil on the face of the streambank and connecting support for the invasion of the surrounding aquatic, riparian, or upland slope vegetation.

Temporary fascines may be constructed to slow surface water flows and allow for more infiltration on droughty sites.

Conditions Where Practice Applies

A. Streambanks that require immediate erosion protection and streambank revegetation projects.

Design Criteria/Specifications

A. The slope shall be prepared by grading back to a 3:1 slope.

B. Live fascines shall be assembled from fresh plant cuttings, with alternating butt-ends. Fascines shall be 5 to 8 inches in diameter and tied securely with twine or rope every 12 to 15 inches.

C. Live fascines shall be installed shallowly on contour of banks with a face length of 15 feet or less to prevent site disturbance. Fascines shall be installed in shallow trenches that are a shovel deep and a shovel wide. Installation shall start from the bottom of the slope and work up to the top of the slope.

Recommended Spacing for Live Fascines
(measured along the bank face)

Slope Steepness	Undisturbed Erosive Soils	Undisturbed Cohesive Soils	Fill Soils
3H to 1V or Flatter	3 to 5 feet	5 to 7 feet	3 to 5 feet*
Steeper than 3 H to 1V (up to 1H to 1V)	3 feet	3 to 5 feet	0

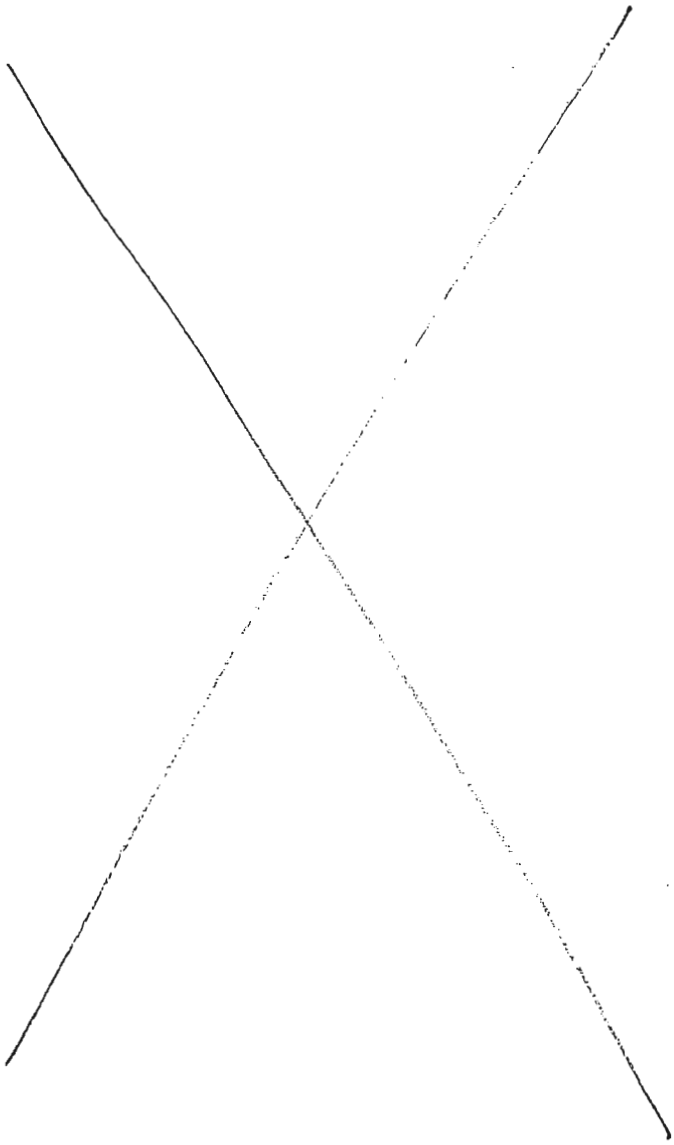
**Not recommended alone – use with erosion control matting. Sotire & Associates.*

D. Live plant material stakes or construction stakes shall be used to anchor fascine bundles. Live stakes shall be at least 18 inches long and between 1 and 3 inches wide. Construction stakes shall be made from 2"x 4" untreated lumber. Stakes shall be made 30 to 36 inches long and cut diagonally across the 4-inch face, tapering to a 1/8 to ¼-inch tip.

E. Stakes shall be installed directly through the live fascine bundle to ensure it will not lift up, nor allow water to move under the installation. Stakes shall be placed no more than 3 feet apart and preferably every 1-1/2 feet apart. Best installation shall alternate use of live and construction stakes.

F. Soil shall be placed along the sides of the live fascines and around all stakes and foot tamped in to provide for growth media.

(Install Drawing Figure 12)



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Primary Purpose

- To provide stability of streambanks.
- To support the establishment of permanent streambank cover.
- To slow surface flows and allow for infiltration.

SHALL NOT be used:

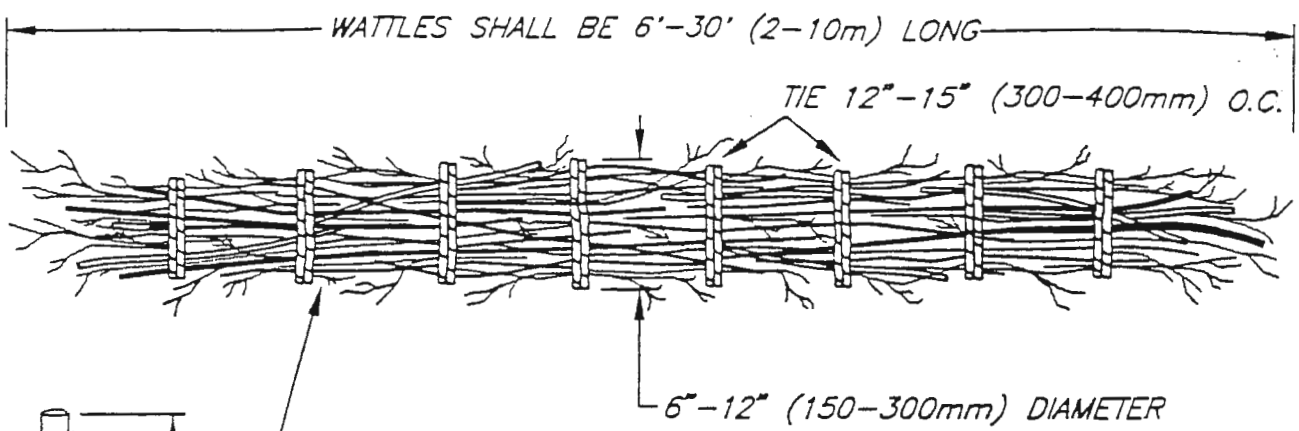
- Fascines should never be used on 1:1 or steeper slopes.

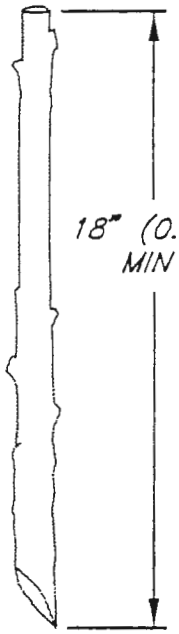
Installation Tips

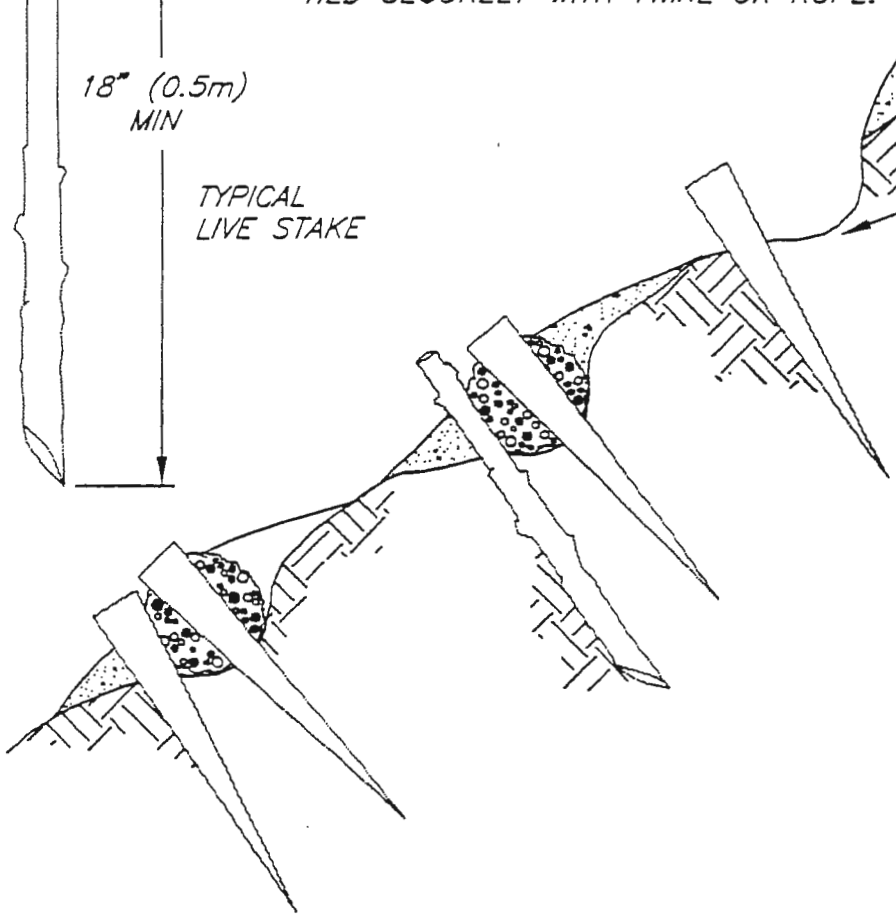
- Store willow or other vegetation in water until bound and installed.
- Install fascines during the dormant season of the vegetation used.
- Assure soil is adequately worked around bundle.
- Do not completely bury the fascine. You should be able to see the top edges of the branches.

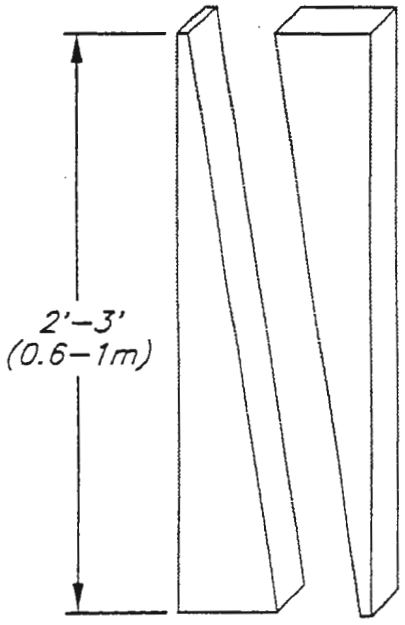
Signs of Failure

Sign of Failure	Cause	Solution
Fascine has dislodged or is gone	▪ Fascine was not appropriately anchored.	▪ Reanchor with additional stakes and assure fascine is tapped down into the trench. Repack soil.
Fascines are not growing	▪ Lack of contact with fascine and soil. ▪ Fascines are dead (failure of plant growth, but still acting as a mechanical barrier to slope flows).	▪ Re-bury, adding water and nutrients if needed. ▪ Seed or add live stakes to streambank to provide for vegetative growth.





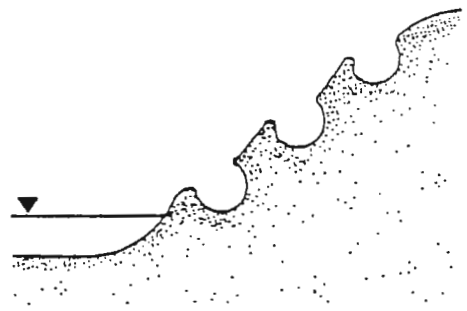


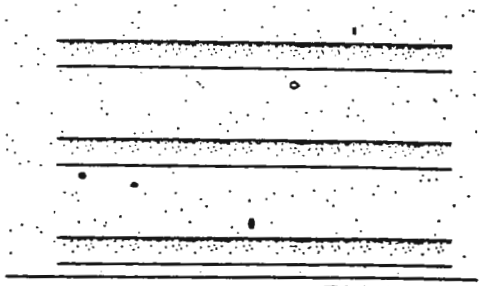


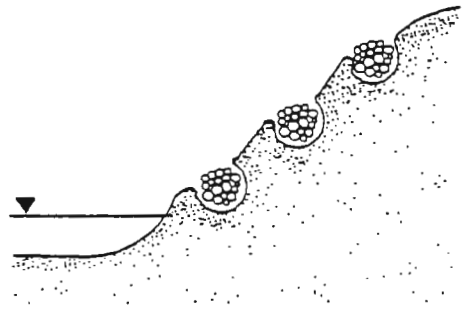
TYPICAL CONSTRUCTION STAKE
SAW 2X4 (100X50mm) LUMBER
ON DIAGONAL

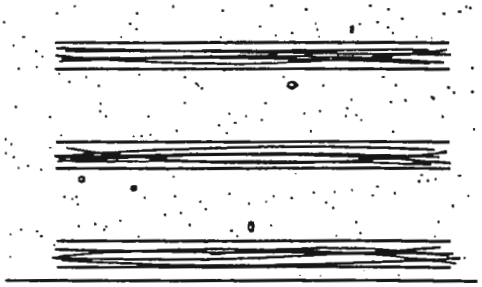
NOT TO SCALE

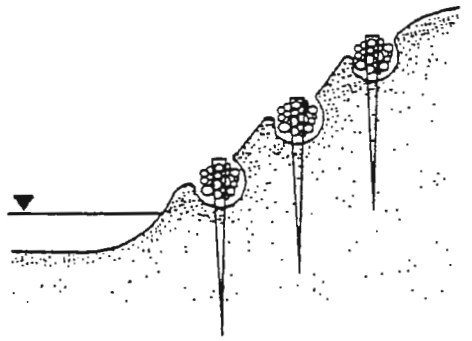
NOTES:
1. HARVEST AND INSTALL WATTLES DURING DORMANT SEASON.
2. INSTALL WATTLES ON SLOPE CONTOURS.
3. ALL WORK PROCEEDS FROM THE BOTTOM OF THE SLOPE TO THE TOP.
4. FILL OR PARTIALLY COVER WATTLE WITH SOIL FROM SLOPE OR TRENCH ABOVE.
5. COMPACT AND WORK SOIL INTO COMPLETED WATTLES.

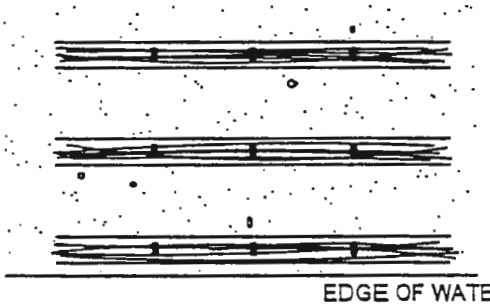


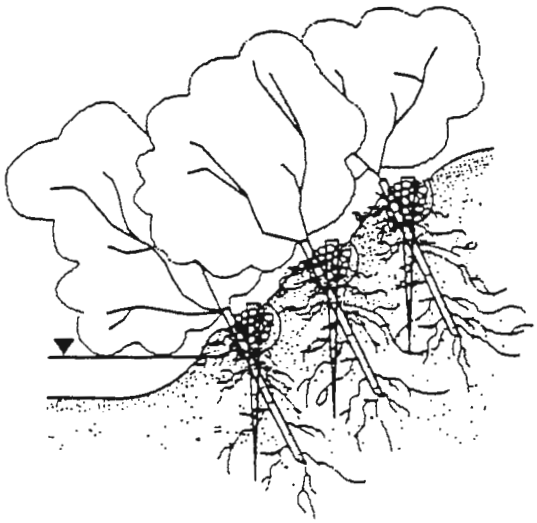


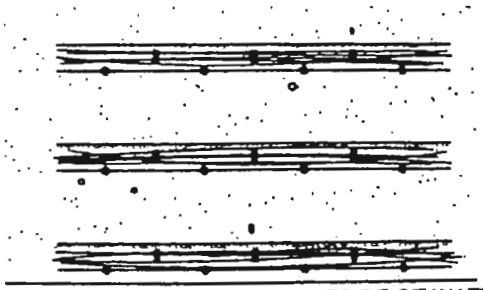












SECTION

PLAN

3.24 Brush Layer/Brushmattress

Definition

A brush layer, also called a brushmattress, is a combination of vegetated structures (live stakes, live fascines and other branch covers) that are used to form a protective vegetated mattress over a streambank or other slope. They require a great deal of live plant material, but provide quick wildlife habitat.

Purpose

To provide a protective layer of live plant material that will root and grow to hold soils and provide permanent vegetative cover, on streambanks and slopes. Provides immediate flood protection of exposed streambanks.

Conditions Where Practice Applies

A. On banks or slopes that requires immediate surface protection.

Design Criteria/Specifications

A. The slope shall be smooth graded to a minimum of a 2H to 1V slope, but a 3H to 1V slope or flatter is preferred. If project is on a fill slope, compact the fill into 6- to 8-inch lifts. Excavate the trench at the base of the slope or just above mean water level, to install a live fascine bundle that will support the toe of the slope. Slope or bank face length shall be 10 feet or less.

B. Live woody plant materials with adequate rooting potential shall be prepared. Prepare fascine bundles as specified in that description. Live stakes for this installation can be as small as ½- to 1-inch in diameter. Branch mattress materials shall be long (2 to 8 feet), flexible and ½- to 1-inch in diameter. Materials usually are long branch tips from woody plants.

C. Wire or twine will be needed to tie down brush materials to the staked sections of the mattress. Do not put tension on the branches so that they rise off the slope face. Construction stakes will also be required. Cut as specified in live fascine description.

D. Place fascine bundles at slope toe and secure with live or construction stakes. Cover with soil as specified in fascine description.

E. Tamp stakes over the slope face in a multi-row or square pattern, using all live stakes or alternating between live and construction stakes. Stakes shall be 2 to 4 feet apart. Assure that the live and construction stakes are adequately secured with tamped in soil.

F. Lay brush material between stakes. Cut ends of the brush material shall be placed at the base of the slope under the live fascine, with the growing tips towards the top. The branches should lie smoothly against the bank. Tie or wire branches between stakes, as close to the slope face as possible using a criss-cross pattern. Cover and tamp in soil to provide branch materials contact with growth media.

G. On fill slopes, layer brush material between lifts, with growing tips protruding from the slope face.

Primary Purpose

- To provide stability of streambanks and slopes.
- To support the establishment of permanent vegetative cover.
- To provide immediate flood protection.

SHALL NOT be used:

- On greater than 2H to 1V slopes, unless laid in between lifts on steeper fill slopes.

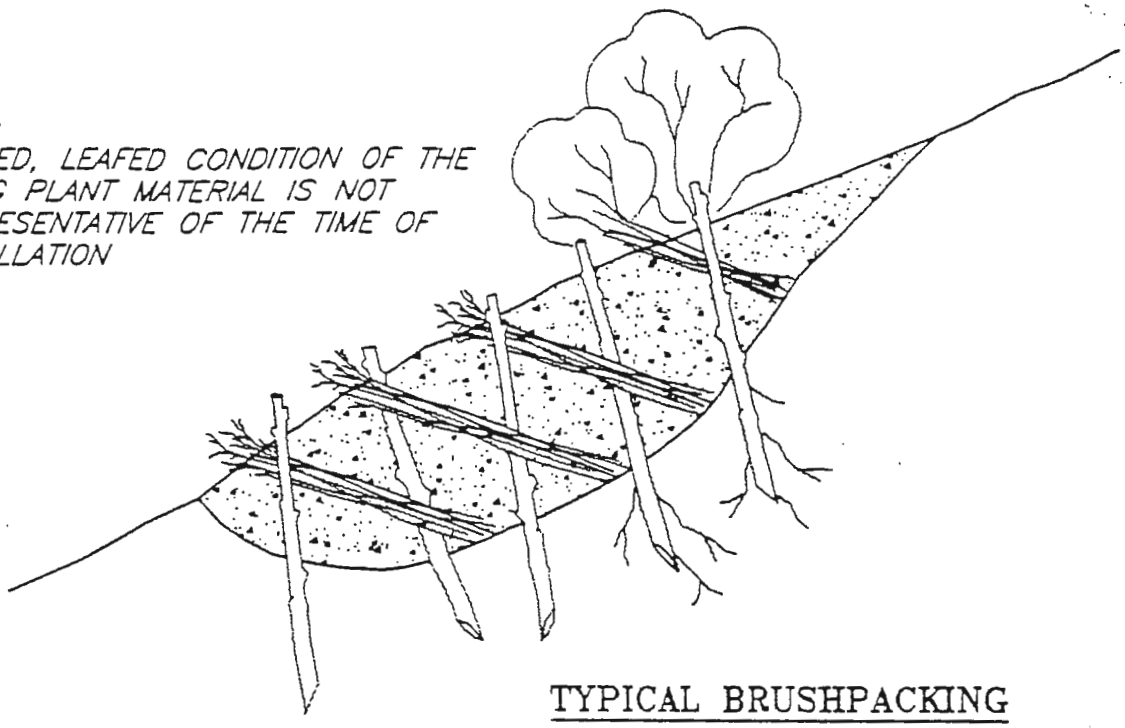
Installation Tips

- Store willow or other vegetation in water until bound and/or installed.
- Install during the dormant season of the vegetation used.
- Assure soil is adequately worked around all plant materials.
- Cover all live materials with soil so branches are still visible. Do not bury completely.
- Do not drain water through brush layer – gullies under the layer are likely to form.

Signs of Failure

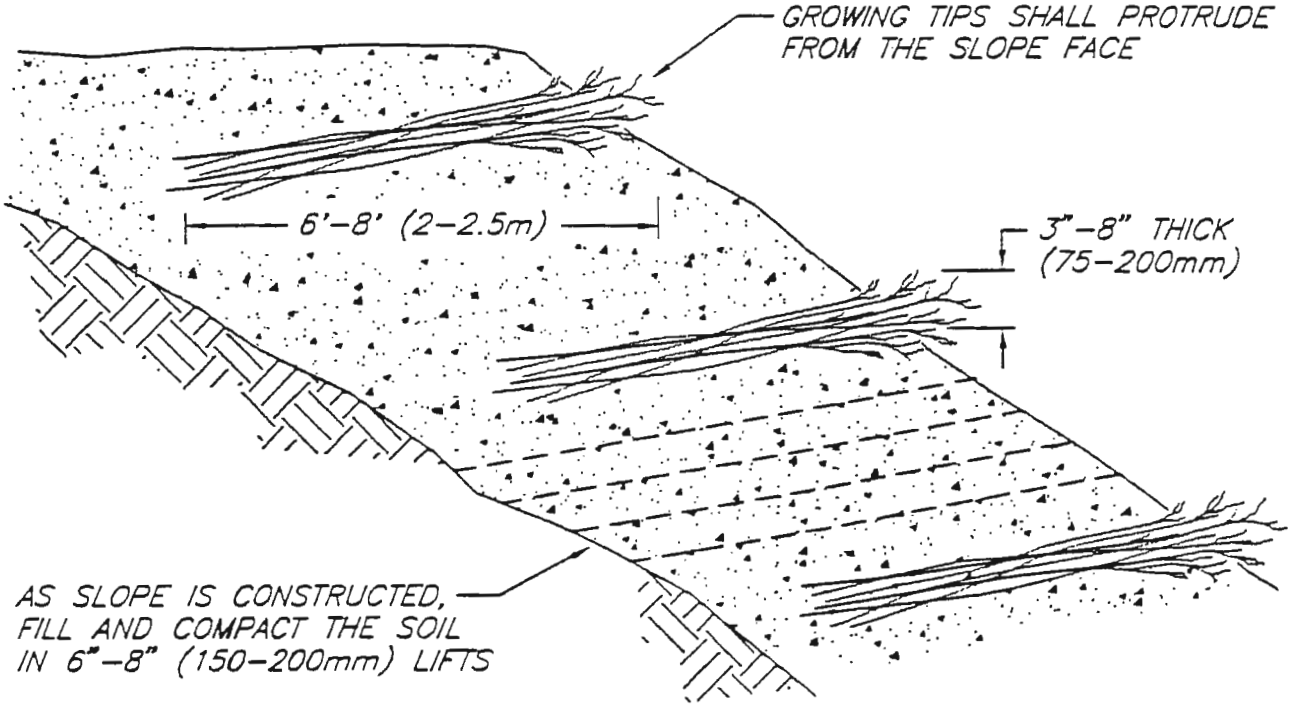
Sign of Failure	Cause	Solution
Layer has dislodged or is gone	▪ Branches were not adequately tied down. ▪ Stakes are loose or missing.	▪ Add replacement materials and retie with stronger material. ▪ Replace stakes and assure soil is tapped down around stakes.
Brush layers are not growing	▪ Lack of contact with brush materials and soil. ▪ Materials are dead (failure of plant growth, but still acting as a mechanical barrier to slope flows).	▪ Re-bury adding water and nutrients if needed. ▪ Seed or add additional live materials to provide for vegetative growth.

NOTE:
ROOTED, LEAFED CONDITION OF THE LIVING PLANT MATERIAL IS NOT REPRESENTATIVE OF THE TIME OF INSTALLATION

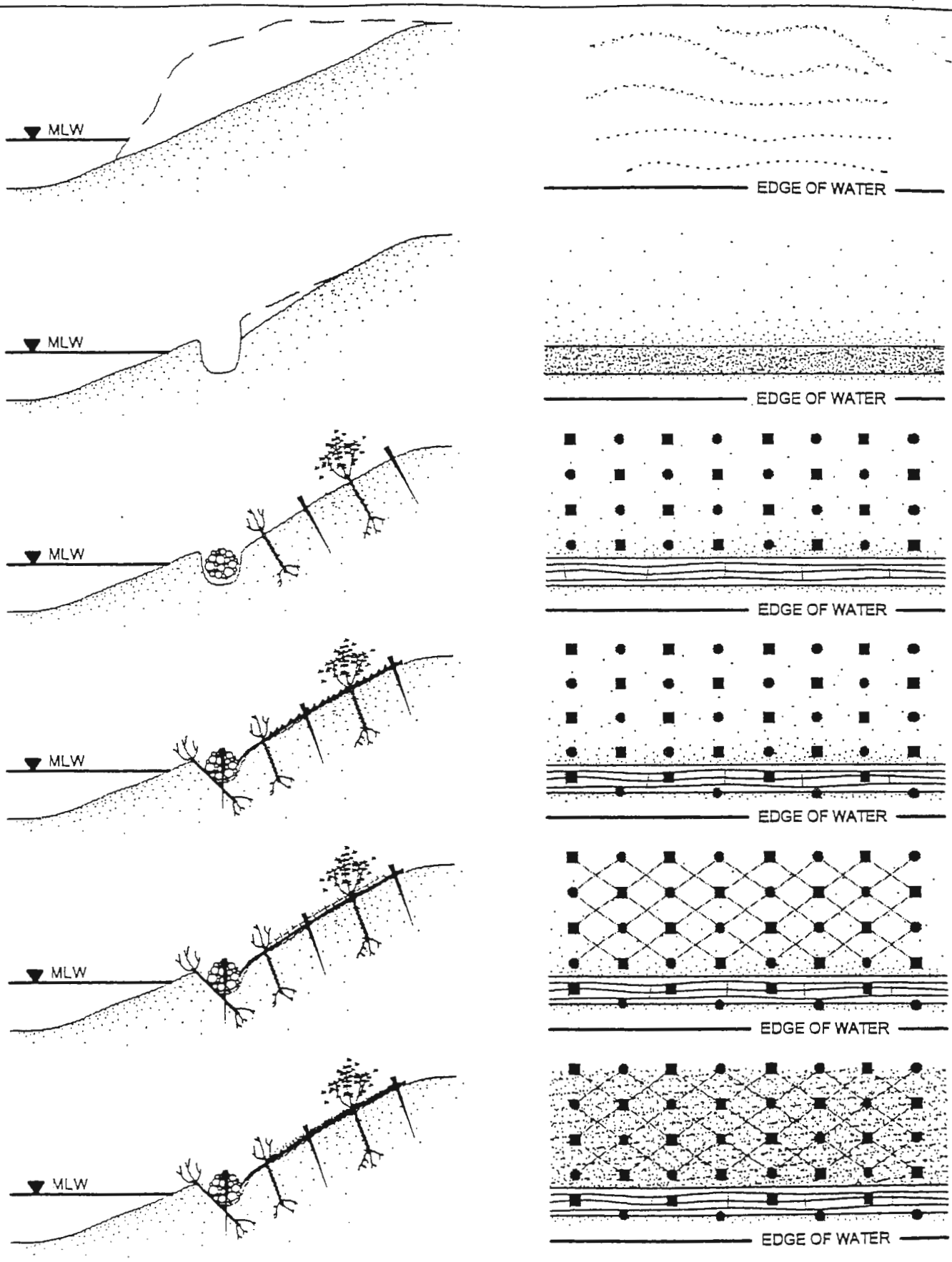


TYPICAL BRUSHPACKING

COVER BRUSHLAYER IMMEDIATELY WITH 6" (150mm) OF FILL SOIL, WATER AND COMPACT ACCORDING TO SPECIFICATIONS



TYPICAL BRUSHLAYERING WITH SLOPE CONSTRUCTION



TECHNICAL GUIDANCE HANDBOOK

BRUSHMATTRESS INSTALLATION PROCEDURES

Detail Drawing 3.248

3.25 Cribwall

Definition

A cribwall is a rectangular framework of logs or timbers, rock and woody cuttings that protect eroding streambanks and provide overhead cover for fish. Design of these systems requires an in-depth assessment and understanding of stream flows and stream behavior. Various types of installations are used (see design details).

Purpose

To ensure bank stability and crate an excellent natural habitat for a variety of fish, birds, and other animals.

Conditions Where Practice Applies

A. Barren streambanks, especially where space is limited like on small narrow stream corridors.

Design Criteria/Specifications

A. Live cribwalls should be constructed during low to normal flow conditions. Stream flows should be diverted around the construction sites with berms or other barriers. Identify the mean low water level on the bank to be repaired.

B. Prepare the bank. A cribwall should extend as far back into the bank as necessary to assure structure stability. Excavate to an appropriate slope with a bank height of 4 feet or less. Excavate 2 to 3 feet below the surface of the streambed or bottom for live cribwall installation.

C. Prepare plant materials. Dead logs or timbers shall be striped to the bark-covered trunk, be 4 to 6 inches in diameter, and cut to various lengths specific for the project. Logs must be long enough to provide adequate length to key in (secure back) into the bank. Live branches used to fill in with rock, soil and other materials should be ½ to 2 inches in diameter and 4 to 6 feet long. Branches shall be stripped for the length that is keyed back into the cribwall, but may have vegetation on the sections protruding from the wall. Installation may be easier with branches pruned to the main branch.

D. Prepare rebar and cribwall fill. Rebar rods are used to secure crib sections to the banks and to secure logs to each other. Cut ¾-inch rebar into 6-foot lengths for bank anchoring and at least 10 inches or in lengths long enough to secure cross sections on the log wall. Fill material should drain well and provide enough nutrients and other soil factors to allow for plant growth. Explore reuse of excavated bank material. River rock or other gravels will be needed to stabilize the toe of the slope.

E. Installation varies depending on the desired final slope of the wall (1H to 1V or 2H to 1V are the most common). The concept is to stack logs in a log cabin type cross hatch and backfill with rock, soil and live plant materials. Following the generalized installation procedures:

1. First install your anchor logs. These logs lie parallel to the stream flow. Logs shall be anchored at the front and back of the wall sections. You may choose to not have a back anchor log to create an incline to your cribwall (see Figure 3-24). Anchor these logs with the 6-foot sections of rebar.

2. Then place the next layer of logs or timbers in the bottom of the excavation. Logs shall be long enough to key into the back of the bank. All logs shall be secured with rebar at each crossing point and backfilled with 2 to 4 inches of compacted rock to help protect the bank slope. This process shall be continued, backfilling with rock until wall sections are above mean low water level. You may choose a 50% rock, 50% fill mix on the layer right at water level to provide for plant establishment down to the water's edge.

3. Continue installation of logs in a crosshatch pattern, securing each level to the logs below with rebar. Backfill with prepared material for each layer above mean low water level. Add live material and brushy branches on the fill with the growing tips towards the stream. The final layer of logs, fill material and brush placement should reach the top of the original bank. The structure will be more secure if it does not protrude into the stream, but is flush with the existing streambank.

4. Protect the top layer of fill with erosion control mats, grid systems or other reinforcements that allow for permanent plant establishment while protecting exposed soils.

Primary Purpose

- To provide and protect stability of streambanks.
- To support the establishment of permanent streambank cover.
- To provide overhead cover for fish.

SHALL NOT be used:

- On streambanks more than 4 feet high.

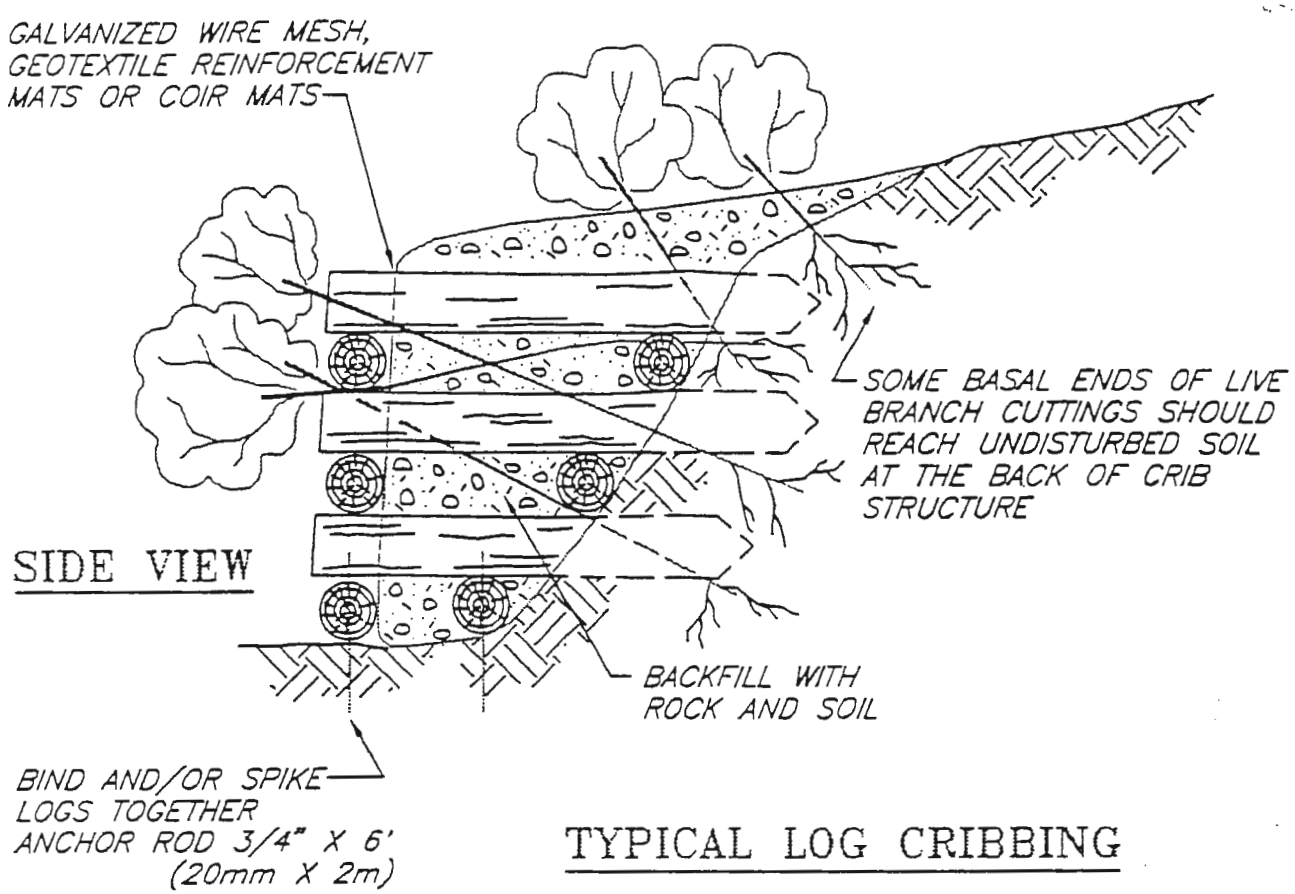
Installation Tips

- Make sure there is a good foundation. Most cribwalls fail due to insecure foundations. Assure anchor logs are well secured and that layered logs are well keyed back into the existing bank.

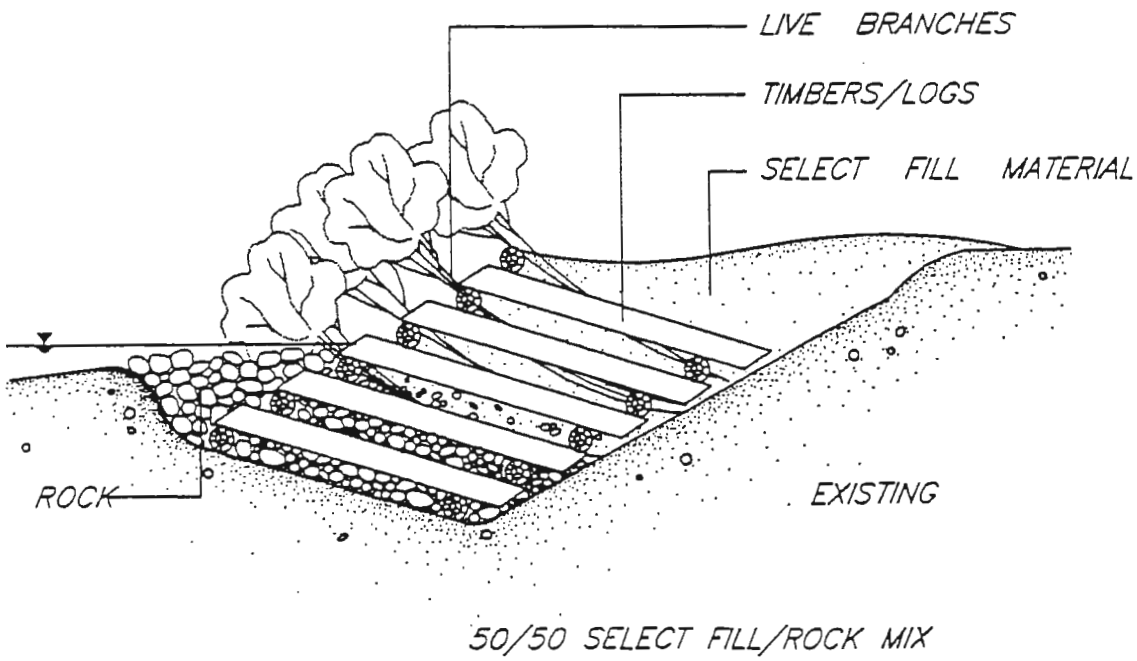
- To prevent scour on upstream and downstream ends – key the cribwall logs into the side banks as well as the rear banks.
- Assure live plant materials stay moist until installation.
- Determine whether temporary irrigation is necessary for plant establishment.
- Add live stakes on the topsoil layer, which are long enough to reach bank and anchor into the original bank.

Signs of Failure

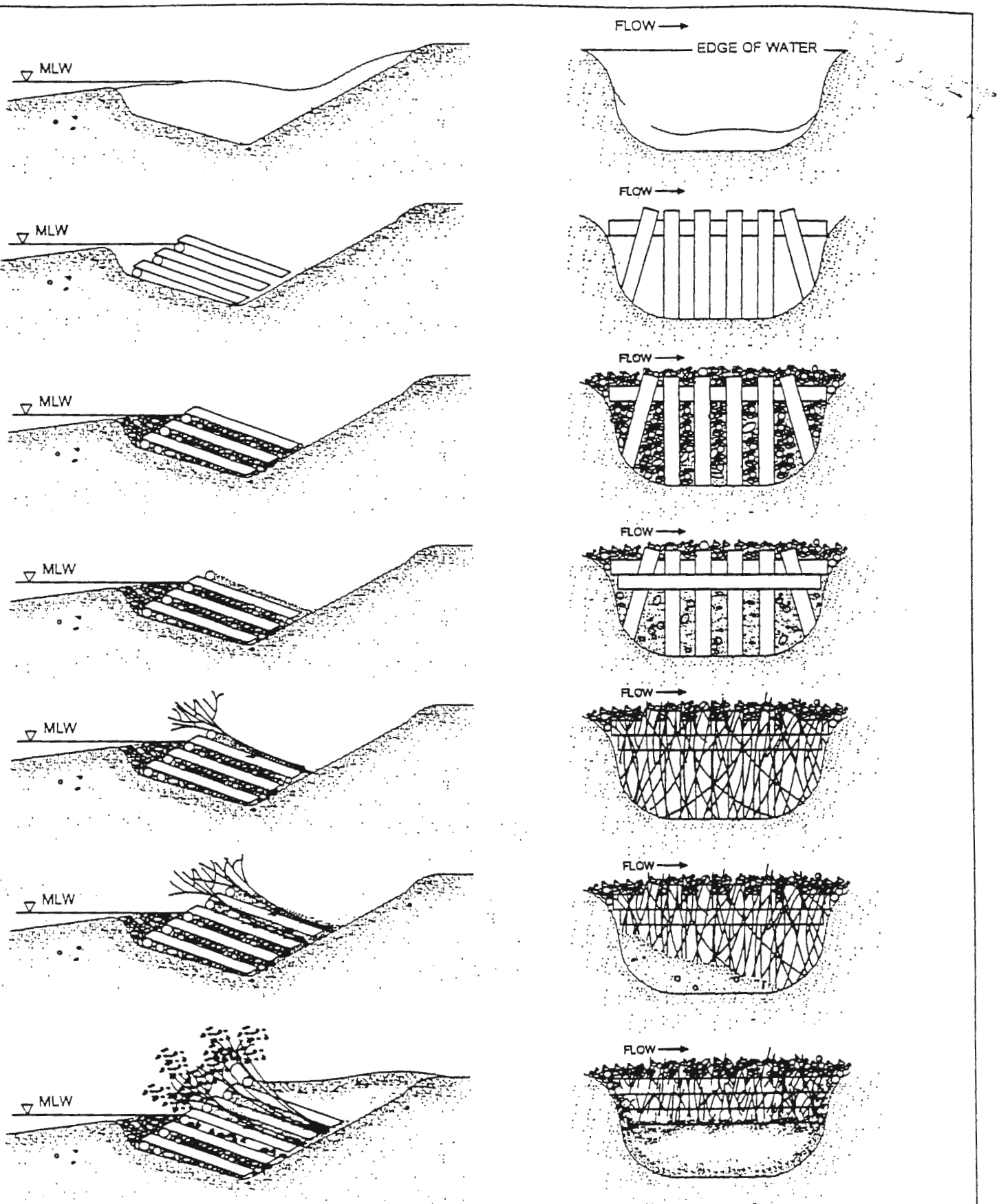
Sign of Failure	Cause	Solution
Cribwall has dislodged or is gone	▪ Cribwall was not appropriately anchored. ▪ Cribwall was not appropriately placed against flow.	▪ Reexamine design and recheck stream flow assumptions. ▪ Replace missing cribwall sections, assuring they are adequately keyed back into the bank and anchored with rebar.
Cribwall backfill is eroding	▪ Flow has been directed into a weak section of the cribwall. ▪ Spacing between layers is not protected by log sections.	▪ Provide reinforcement (rock, mats) for weak areas. ▪ Re-install wall incline logs toward the stream.
Live plantings are not growing	▪ Lack of contact with plants and soil. ▪ Plants are dead. ▪ Soil is unable to support plant growth.	▪ Re-bury plant ends adding water and nutrients if needed. ▪ Replace dead plants.



TYPICAL LOG CRIBBING



LIVE CRIBWALL



TECHNICAL GUIDANCE HANDBOOK

LIVE CRIBWALL
INSTALLATION PROCEDURES

In-Stream BMPs

3.26 In-Stream Sediment Trapping Devices

Definition

In-stream sediment trapping devices include both floating materials (turbidity curtains) anchored to the watercourse bottom and in-stream sediment collection mats that run along the watercourse bottom (Sedimat ™). These materials are specifically designed to limit sediment transport impacts within a body of water.

Purpose

To provide sedimentation protection for in-stream, bank or upslope land disturbance or from dredging or filling within a waterway.

Conditions Where Practice Applies

A. Within a flowing watercourse, lake or other area of water impoundment or flow that has aquatic resources needing protection.

NOTE: Various state (DSL, DEQ) or Federal Permits (ACOE) may be needed for these installations.

Conditions Where Practice Does Not Apply

A. Turbidity curtains shall not be installed across streams unless specifically engineered to stop sand bar creation.

Design Criteria/Specifications

These BMPs are designed and selected for specific flow conditions. For sites with flow velocities or currents greater than 5 feet per second, a qualified engineer and product manufacturer must approve of the use.

A. Turbidity curtains shall be installed parallel to flow of the watercourse allowing for 10% to 20% variance in the straight-line measurements. Allow for at least 50 feet between joints in the curtain and no more than 100 feet between anchor or stake locations.

B. In-stream sediment mats can be aligned either direction along the watercourse bottom, as long as upstream mat overlaps the downstream mat (like a drainage ditch erosion control blanket installation). Assure the upstream edge is firmly trenched in to prevent flows from going under the mat. Mats should cross the entire stream and be staked or use stones to keep the mat in place. Follow the manufacturer's specifications for length of mat needed for your site's flow rate.

C. Turbidity curtains shall extend the entire depth of the watercourse. In significant wind, wave or tidal action areas, a 10- to 12-foot depth is the most practical due to fabric and mooring anchor strain from the heavy water and sediment loads.

D. Soils shall be allowed to settle for a minimum of 6 to 12 hours prior to BMP removal or cleaning. All cleaning operations shall also use good sediment control practices. Consider sizing materials adequately to allow for maintenance prior to removal and not throughout the project.

E. For tidal situations or in areas heavily impacted by wind generated wave action, turbidity curtains must have slack to follow the rise and fall of the water level without submerging. Curtains shall also maintain adequate flow through, usually by using heavier woven fabric for the bottom sections of the curtain.

F. Materials shall be of strong, heavy weight materials that have UV inhibitors. The tensile strength shall be sufficient to withstand predicted flows. All material seams and line attachments shall be sewn or vulcanized welded into place. Materials shall be of bright colors, when applicable, to attract attention of boaters or swimmers using areas near the work site. Flotation devices for turbidity curtains shall be flexible, buoyant units contained in an individual flotation sleeve or collar attached to the curtain.

G. Turbidity curtains shall be anchored by vinyl-sheathed steel cable at the top with a breaking strength as per engineer specifications or 10,00 pounds. At the bottom, a load line with chain incorporated into the bottom hem of the curtain shall be used for ballast to hold the curtain vertical.

H. Shoreline turbidity curtain anchors and in-stream sediment mat anchors shall be 2'x4' wood or 1.33 pounds/lineal foot metal stakes. Bottom anchors for turbidity curtains shall hold the curtain in position and may be any of the following anchor types: plow, fluke, mushroom, or a grappling hook. All in-stream anchors shall have a floating anchor buoy or other identifying mark.

I. Best installation is achieved by setting the upstream anchor points first, then unfurling the fabric letting the flow carry the fabric downstream or to vertical position for turbidity curtains.

Maintenance/Removal Guidelines

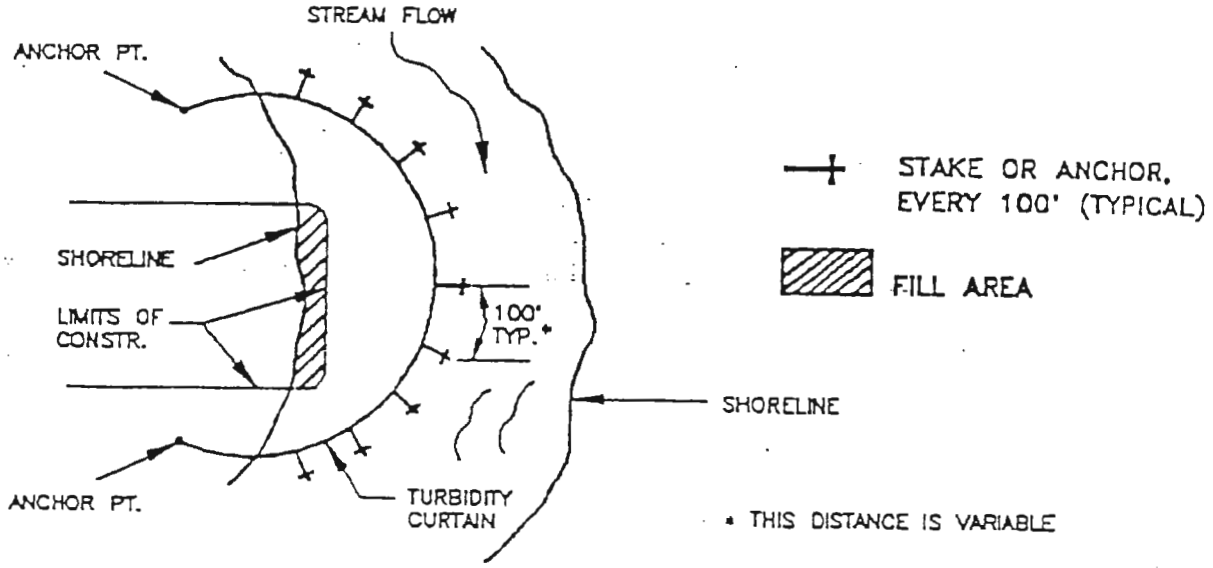
A. Follow manufacturer instructions for fabric and material repair.

B. All materials shall be removed at low flows and in such a fashion as to scoop and trap sediments within the fabric. The removal area should be clear of any obstructions that could tear the fabric. For mats, consider rolling up from the downstream end to trap silts in the mat roll. For curtains, consider pulling the bottom line and top lines in together like a parachute to pull soils ashore.

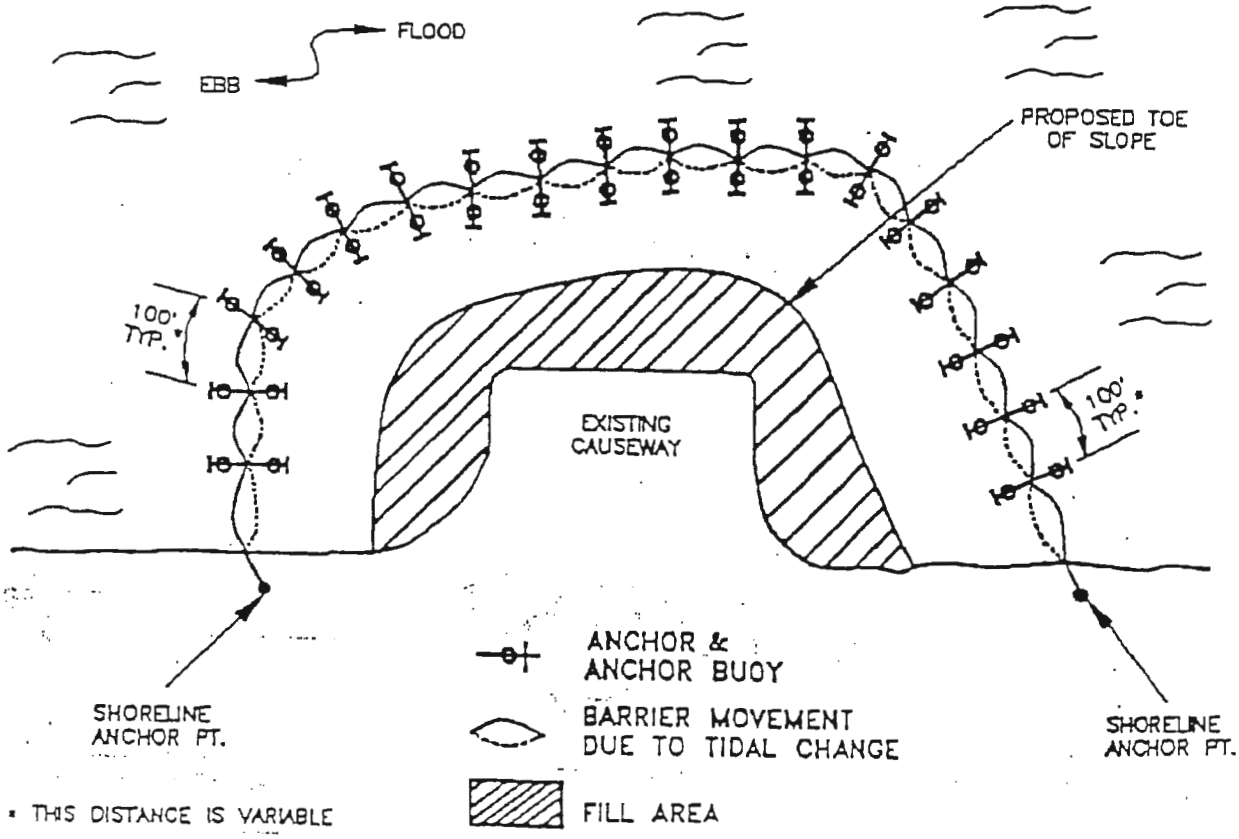
C. Spoils should be reused and controlled for erosion on a nearby bank or upland area needing stabilization.

TURBIDITY CURTAIN

TYPICAL LAYOUTS:
STREAMS, PONDS & LAKES (PROTECTED & NON-TIDAL)



TIDAL WATERS AND/OR HEAVY WIND & WAVE ACTION

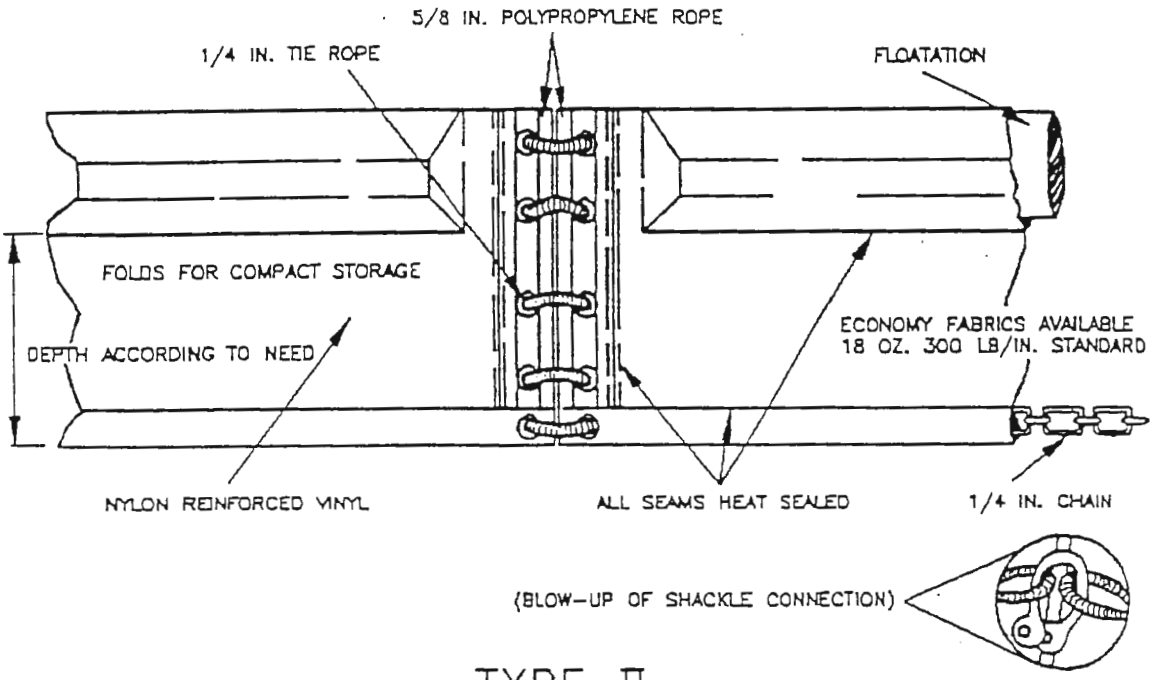


TECHNICAL GUIDANCE HANDBOOK	TURBIDITY CURTAIN TYPICAL LAYOUTS p.99 Detail Drawing 3.26A

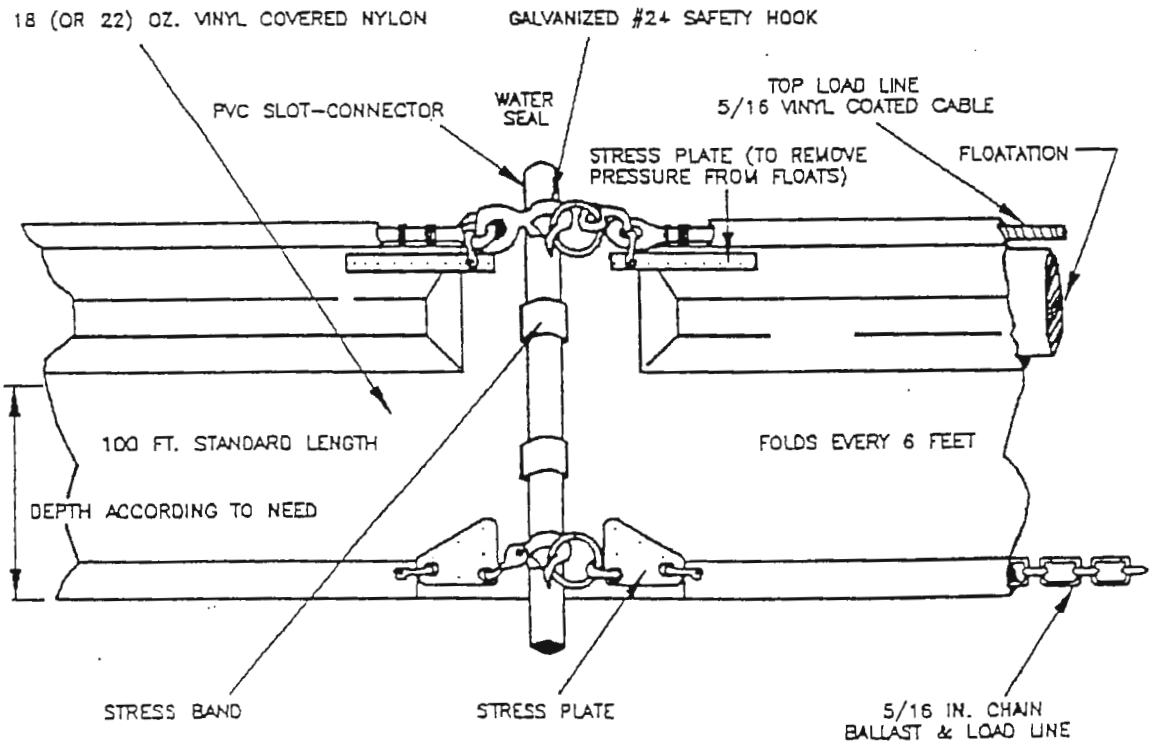
FILE: DRAFT:INSPECTORS GRAPHICS DRAWING PLOT:

TURBIDITY CURTAIN

TYPE I

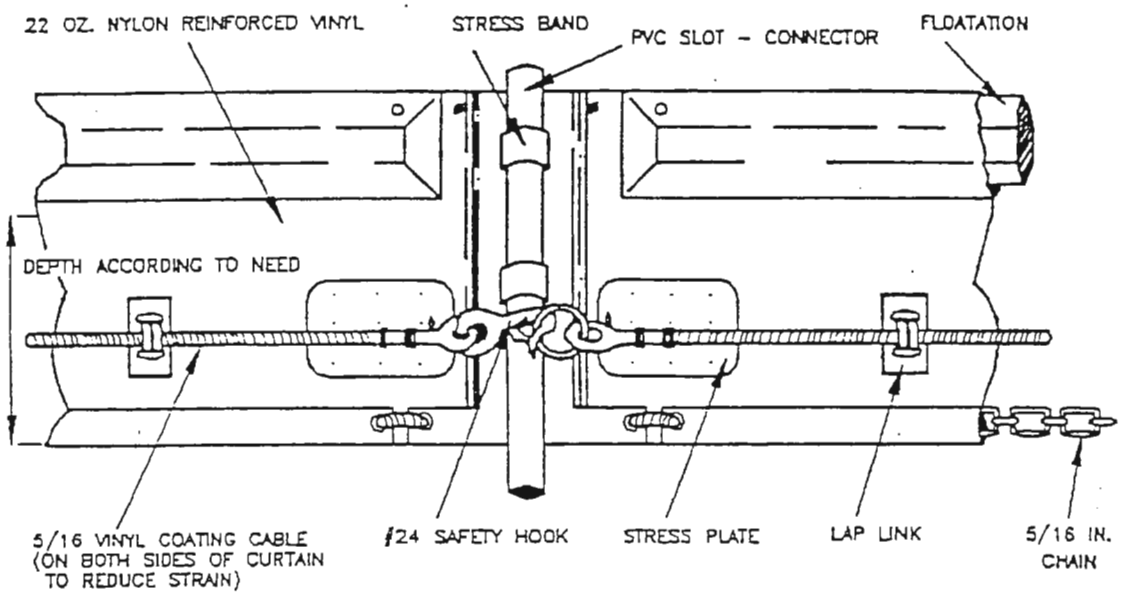


TYPE II

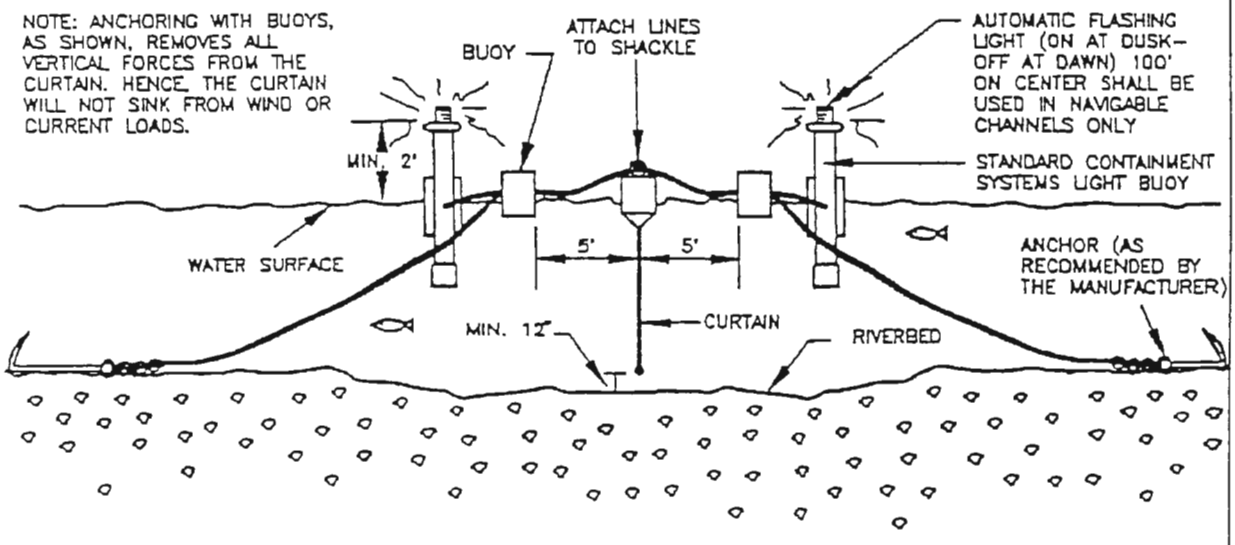


TURBIDITY CURTAIN

TYPE III



ORIENTATION WHEN INSTALLED (TIDAL SITUATION - TYPE III)



TECHNICAL GUIDANCE HANDBOOK	TURBIDITY CURTAIN TYPE III Detail Drawing 3.26C p.101

FILE DRAFT:INSPECTORS GRAPHICS DRAWING PLOT 1:1

4.1 Construction Activity Controls

Many construction activities can generate other pollutants beyond sediment. The BMPs described in this chapter are designed to give guidance to the contractor in control of liquid and solid waste materials during construction. Most of the following BMPs have a strong planning component and need to be considered during site layout. Again, the contractor is encouraged to practice prevention measures rather than control measures.

Although sediment is the most prominent pollutant that is generated at a construction site, there are a number of other wastes, by-products and construction site materials that can be harmful to worker health, streets and storm water conveyance systems, and to streams or other waterways. The table below describes some of the most common construction site pollutants generated by construction activity and some of the impacts of those pollutants. It also gives general guidance of what to do with the materials.

Table: Common Construction Site Pollutants

Source	Waste	Impacts	Guidance
Demolition Waste	Asbestos	Human Hazard	Get a DEQ permit prior to removal. Assure that waste is disposed of at a landfill approved to take asbestos.
	Solid Waste	▪ Poor Aesthetics ▪ Dust ▪ Tripping hazard ▪ Inlet blockage ▪ Reduces in-stream oxygen ▪ Impairs fish movement and feeding	Solid waste can degrade your site in the eyes of neighbors and potential buyers. Control wastes in a designated area or facility and recycle as much as possible to lower landfill fees.
Equipment Fueling	Antifreeze	▪ Reduces in-stream oxygen ▪ Impairs groundwater resources ▪ Toxic to pets and children	Recycle, if possible. If not, contact local sewerage agency for discharge limitations and approvals. **DO NOT** pour into storm drains or on ground.
	Gasoline Hydraulic Fluid Oils (gear, lubricating or engine) Brake Fluid	▪ Flammability hazard for site and sewer workers. ▪ Can instantly kill fish, impair feeding or smother gravels. ▪ Reduces in-stream oxygen.	Minimize amount of fuels and oils needed on-site. Consider doing fueling and maintenance of vehicles back at yard or at other off-site controlled location. Store fuels or oils in designated and marked areas. Provide berms or protection from construction traffic Provide adequate spill control structures and training.
Equipment Maintenance	Used Oil	▪ May be a hazardous waste. ▪ (same as above)	Recycle or reuse if possible. If not, do a hazardous waste determination to determine appropriate level of disposal.

Activity	Waste	Impacts	Guidance
Concrete Work	Concrete Waste	▪ Can clog inlets. ▪ Can smother stream gravels. ▪ Reduces in-stream oxygen.	Control wastes on-site in defined area. Dispose of wastes as per manufacturer. **DO NOT** allow wastes or curing materials to enter storm drain.
	Sealants	▪ Flammability hazard for site and sewer workers. ▪ Reduces in-stream oxygen.	Don't buy or mix more than needed. Paint excess out on scraps, let dry and dispose of in dumpster. Any left over materials should be disposed of at approved facility.
Framing Roofing	Wood Preservatives	▪ Flammability or toxic hazard for site and sewer workers. ▪ Can directly kill fish. ▪ Reduces in-stream oxygen.	Consider use of innovative products for areas exposed to the elements. Buy materials with preservatives already applied at the factory. Don't buy or mix more than needed. Completely dry out all containers and dispose of in dumpster. Any left over liquid must be disposed of at approved facility.
	Resins	▪ Flammability or toxic hazard for site and sewer workers.	Don't buy or mix more than needed. Paint excess out on scraps, let dry and dispose of in dumpster. Any left over materials should be disposed of at approved facility.
	Solid Waste	▪ See above.	See above. Consider vacuuming or lining gutters to collect shingle debris. **DO NOT** rinse shingle debris down downspouts.
Plumbing HVAC	Solid Waste	▪ See above. ▪ Metal debris can leach long term harmful chemicals to streams.	See above.
	Solvents / Degreasers	▪ Flammability hazard for site and sewer workers. ▪ Reduces in-stream oxygen. ▪ Impairs groundwater resources.	Reuse and recycle when at all possible. Contain materials on impervious surfaces. **DO NOT** rinse materials to storm drains or onto the ground. Dispose of materials through licensed waste management firm.
Painting	Paint Thinner	▪ Same as Solvents.	Same as solvents. Let thinners settle and strain out materials to allow for reuse. Dispose of material only after it is too contaminated to strain anymore.

Activity	Waste	Impacts	Controls
	Paints	▪ Flammability or toxic hazard for site and sewer workers. ▪ Reduces in-stream oxygen. .	Reuse and recycle when at all possible. Latex – paint excess out on scraps, let dry and dispose of in dumpster. Check with fire marshal for oil based disposal. Any leftover materials should be disposed of at approved facility.
Landscaping	Fertilizer	▪ Increases algae growth. ▪ Reduces in-stream oxygen. ▪ Affects pH balance. .	Design sites with native and other plants that need little or no additional soil amendments. Use composts or organic fertilizers instead of nitrogen and phosphorus based fertilizers when at all possible. Control fertilizer piles, providing protection from rain and runoff if needed. Till all fertilizers well into the topsoil layer.
	Pesticides / Herbicides	▪ May create health hazard for site and sewer workers. ▪ Can kill fish on contact or mutate over longer periods of time. ▪ Can impair groundwater resources. .	Design sites with native and other plants that need little or no horticultural chemical care. Use biological and structural controls before resulting to chemical controls. If chemical control is needed, consider using organic compounds. Don't mix more than is needed for the site. Time application to specifically address pest or condition. Watch overspray, especially over water.

** *For adequate disposal, refer to Metro's guide for construction waste or call the Resource Information Center at 234-4000 for more information.*

Hazardous and Special Wastes

As noted in the table above, some construction pollutants may require additional activities to comply with hazardous waste and materials handling and disposal laws. All contractors are encouraged to call the local DEQ hazardous materials program for more information (1-800-452-4011).

In general the following materials may require additional controls and/or consideration during use and disposal:

- Oil / Water Based Paints
- Form Oil and used Oils
- Sealers
- Degreasers
- Petroleum Products
- Vehicle Batteries
- Pesticides and Herbicides
- Fluorescent and High Density Lamps
- PCBs (polychlorinated biphenyls found in old electrical equipment).
- Asbestos (in insulation, tiles, joint cements and caulks, stucco, and a variety of materials).
- Lead (in paints, roofs, tank linings, plumbing soft solder).

If you have any of these materials on-site, call DEQ for information about the regulations that pertain to you.

4.2.1 Dewatering

Purpose

To assess and appropriately dispose of rising groundwater or rainwater from excavations and other collection areas.

Conditions Where Practice Applies

Public or Private properties with:

A. Foundation work excavations.

B. Utilities and infrastructure installation and repair projects, including installation, repair and maintenance of:

   i. Electrical conduits
   ii. Vaults / tanks
   iii. Sewer and storm drain systems
   iv. Phone and cable lines
   v. Gas or other fuel lines

C. Other excavations or graded areas requiring dewatering.

Design Criteria/Specifications

Depending on season, flow rate, volume or residual contamination, discharge will be allowed to:

A. The ground in a manner that ensures no runoff leaving the site. This may require a permit or other authorization from the local and/or State drainage authority.

B. The storm drain system. All discharges shall meet the TSS and/or turbidity levels required by the local sewerage agency. A permit or letter of authorization with discharge restrictions may be required.

C. The sanitary sewer. A permit or letter of authorization with discharge restrictions may be required.

In extremely rare instances, you may be required to haul pumped groundwater or impounded storm water off site for treatment and disposal at an appropriate waste treatment facility.

A. Site assessment. The site shall be assessed for the issues listed below to assist the local sewerage and/or drainage authority in determining which discharge option to approve.

1. Water clarity. If the water is cloudy or turbid, there are dissolved and/or settable solids in the water that must be filtered or settled out prior to discharge. See treatment options outlined in B below.

2. Determine if contaminants are present in impounded waters. Check for odors, discoloration, or an oily sheen. Review Phase I environmental assessment to determine if contamination is likely. Check any soils and/or groundwater testing results.

3. Contamination may be or is present. A certified laboratory must test proposed discharge waters with results submitted to the local sewerage and/or drainage authority. Sampling and testing requirements will be determined on a case-by-case basis depending on site history or suspected pollutants. Contact the local sewerage and/or drainage authority before testing to get assistance in identifying the required parameters of concern and any specific sampling requirements. After review, the local authority sewerage and/or drainage authority will specify if any pretreatment is required prior to discharge.

B. Sediments shall be settled prior to discharge. All settling systems shall be engineered and adequately sized for site condition. In general settling and filtering options include:

1. Containment in a pond structure for a minimum of 4 hours or until water is clear. Place pump in a gravel bed at bottom of pond,

2. Pumping to a Baker tank or other settling tank with sampling ports,

3. Filtering through a sieve or other filter media (swimming pool filter). Simple on-site filter systems can be constructed including: wrapping the ends of the suction and discharge pipes with filter fabric; discharging through a series of drums filled with successively finer gravel and sand; and other filtering techniques like those described in the inlet protection section.

4. Manufactured bags, polymers, or other systems. These systems do not always work on fine clay soils and will only be allowed for use where approved.

C. Filtered material shall be either dried and reused on-site in a mixture with other site soils or shall be appropriately disposed of based on nature and levels of any contaminants present.

Maintenance/Removal Guidance

A. Remember to check filtering devices frequently to make sure they are unclogged and operating correctly. You may need to make adjustments depending on the amount of sediment in the water you're pumping.

B. Systems shall be filled in or otherwise removed when permanent dewatering controls are in place and connected to an approved treatment and receiving system.

4.2.2 Spill Prevention and Control

Purpose

To prevent or reduce accidental discharges or longer-term leakage of pollutants to storm water systems and/or the ground.

Conditions Where Practice Applies

A. Any area where vehicle and equipment maintenance, fueling or washing operation occurs.

B. Any area where storage of liquid materials and wastes occur.

Design Criteria/Specifications

Use the following measures to control leaks and spills on-site:

A. Prepare a Spill Response Plan for the site. Post spill hotline notification numbers, have spill kits on hand, and train employees what to do in the event of a spill. Provide specific cleanup instructions for the material present or likely to be present on the site. Assign a worker to be responsible for overall site response and cleanup.

B. Specify designated areas for liquid storage areas and all vehicle and equipment maintenance, fueling and washing operations. Sites shall be well marked and located away from drainage courses and systems. In no case shall any liquid storage drum, tank or other vessel (including porta-potties) be stored over storm drains.

C. Provide secondary containment for all vehicle and equipment fueling, maintenance, operation and liquid storage areas. Containment can include any or all of the following:

1. covers or canopies,

2. reverse grading,

3. area berms to contain flows,

4. drain pans or drop cloths, to catch spills or leaks when removing or changing fluids,

5. holding tanks or structures,

6. sand stabilization and containment piles (see drawing)

D. Size secondary holding or containment tanks and structures to hold 10% of total storage volume of all containers present in the work area or 110% of the volume of the largest container in the area.

E. Promptly transfer used fluids to the proper waste or recycling drums. Do not leave full drip pans or other open containers lying around.

F. Provide adequate traffic protection for all designated containment areas. Protection can include berms, flags, pinions, fencing or jersey barriers.

G. Use adsorbent materials (pads, kitty litter, etc.) on small spills rather than hosing down or burying spilled materials. Assure adsorbent materials are collected and disposed of promptly. Verify the appropriate recycling or disposal location for the adsorbent material.

H. Assure that all vehicle or equipment parts (oil filters, batteries, etc.) are appropriately drained, stored and/or disposed of and not left on-site to seep materials to the ground or into storm drains.

Drawings

(Still Under Development)

4.2.3 Solid Waste Management

Purpose

Providing designated waste collection areas and containers to prevent or reduce the discharge of wind blown and floatable pollutants from construction or landscaping activities.

Conditions Where Practice Applies

A. Construction sites, both large and small commercial, residential, utilities and public improvements.

B. Specific work site areas with hazardous or recyclable waste streams.

C. Demolition projects.

D. Landscaping projects.

Design Criteria/Specifications

A. Evaluate waste likely to be generated at the site. Determine which wastes will warrant tighter controls due to hazardous nature or which wastes are reusable or recyclable.

B. Consider buying some materials in bulk or alternative, reusable containers to cut down on packaging wastes.

C. Select designated waste collection areas on-site. Collection areas may be specific to each piece of the operation, i.e. a metal recycling area to contain HVAC, plumbing or framing metal wastes. Be careful siting waste areas in the street or adjacent to other properties. There may be street permit or building code issues with you placement. Consider locating these receptacles adjacent to or within the site gravel entry access to allow for storage on a compacted base and easy removal of wastes.

D. Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it's windy. Make sure that dumpsters are only used for wastes approved for disposal in construction or municipal landfills. All hazardous or special wastes shall be segregated from standard trash and construction debris.

Specific Sites Solid Waste Collection and Containment Recommendations:

E. When working on roofs, line the gutter with fabric, plastic or other materials to collect wastes, or sweep or wash the gutter and trap the particles at the outlet of the downspout. A sock or geofabric placed over the outlet may effectively trap roofing wastes.

F. Recycle used asphalt or concrete. Consider on-site grinding and reuse for subbase as approved by the local jurisdiction.

Maintenance/Removal Guidelines

A. Salvage or recycle any useful material. For example, trees and shrubs from land clearing can be used as a brush barrier, or processed into wood chips, then used as mulch on graded areas.

B. Collect site trash daily, especially during rainy and windy conditions. Remember to also check erosion and sediment control devices since they tend to collect floatables and litter. Remove this solid waste promptly. Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.

C. Do not hose out dumpsters on the construction site. Leave dumpster cleaning to trash hauling contractor.

4.2.4 Vehicle and Equipment Fueling

Purpose

To establish designated areas and preventative measures that prevent fuel spills and leaks, and reduce their impacts to storm water and the ground.

Conditions Where Practice Applies

A. Construction sites with fueling operations.

Design Criteria/Specifications

It is assumed that all off-site fueling locations generally follow this guidance, but are regulated by other City and State codes and policies.

A. Use off-site fueling stations as much as possible. These businesses are usually better designed and equipped to handle fueling operations and spills properly.

B. If fueling must occur on-site, follow all the spill prevention procedures outlined earlier in this manual. Cover, reverse grade and provide secondary containment whenever possible.

C. Locate fueling facilities on impervious areas when at all possible. If paving or concrete pads are unavailable, locate areas on highly compacted soils and/or gravels.

D. Avoid mobile fueling of mobile construction equipment around the site when possible; rather, transport the equipment to designated fueling areas.

E. Discourage "topping-off" of fuel and other fluid tanks.

F. Install vapor recovery nozzles to limit worker exposure to vapors, protect air quality and help control drips.

G. Assure that dispensing mechanisms are either small enough to adequately fill the receiving device or have appropriate shut of valves or other controls. Provide appropriate signage as necessary.

H. Train staff in proper use, clean up and spill response procedures.

Maintenance/Removal Guidelines

A. Maintain dispensing devices as per manufacturer's instructions. Inspect often and log when devices have been cleaned or otherwise serviced.

B. Use dry methods to clean fueling area. If using water to clean, install a temporary plug or containment device in the downstream drain. Pump out accumulated waters, treat and dispose of properly.

4.2.5 Vehicle and Equipment Maintenance

Purpose

To provide off-site facilities and designated on-site areas that help prevent or reduce the discharge of pollutant to storm water from vehicle and equipment maintenance.

Conditions Where Practice Applies

A. Construction sites with vehicle maintenance activities.

Design Criteria/Specifications

It is assumed that all off-site vehicle and equipment repair locations generally follow this guidance, but are regulated by other City and State codes and policies.

A. Use off-site repair shops as much as possible. These businesses are better designed and equipped to handle repair materials and wastes properly.

B. If vehicle repair and maintenance must occur on-site, follow all the spill prevention procedures outlined earlier in this manual. Cover, reverse grade and provide secondary containment whenever possible.

C. Clean vehicles and equipment often. Do not allow excessive build-up of oil and grease that may require harsher chemical or other cleaning processes to remove buildup.

D. Check all incoming vehicles and equipment for leaking oil and fluids or worn hoses and other parts.

E. Store any vehicles awaiting repair or maintenance in designated, preferably paved, areas. If storing for over a month, drain all fluids from the vehicle or equipment and store or dispose of liquids appropriately.

F. Conduct all washing operations in designated, and preferably paved areas. Power washing of parts, vehicles or equipment will likely require pretreatment for oils, grease, detergents and temperature prior to discharge. Discharge will likely be to the sanitary sewer or a dead end sump. Contact the local sewerage agency for more information and for discharge approvals.

G. Segregate, reuse or recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic, and transmission fluids. Use an approved recycling or disposal company for all vehicle and equipment wastes that could potentially be considered hazardous

A. Use dry methods to clean fueling area. If using water to clean, install a temporary plug or containment device in the downstream drain. Pump out accumulated waters; treat and dispose of properly.

4.2.6 Concrete Waste Management

Purpose

To prevent or reduce the discharge of pollutants to storm water from concrete waste.

Conditions Where Practice Applies

Concrete pours, such as:

A. Foundation, footing or pile sites.

B. Driveway, sidewalk, patio or other impervious area construction.

Design Criteria/Specifications

A. Designate materials storage and mixing areas. Store and wet materials under cover, away from drainage system.

B. Perform washout of concrete trucks off-site or in designated areas only. Do not wash out concrete trucks into storm drains, open ditches, streets, or streams. Do not allow excess concrete to be dumped on-site, except in designated areas.

C. Locate designated washout areas as far from storm drains, open ditches, or water bodies as possible (over 50 feet away preferred on larger sites). Line entry/exit areas with gravel to catch washout residues leaking from trucks.

D. Contain washout runoff in a temporary dead end sump, pit or level bermed area large enough to hold liquid and solid wastes. NEVER washout concrete trucks into a storm drain, ditch or waterway. Facilities should be designed specifically for maintenance equipment used, for easy access and to avoid creation of a confined space. Designers are encouraged to create small areas with frequent maintenance rather than larger containment structures. Sumps and pits shall be designed by the site engineer, and in general should have less and 4-foot, protected by cover or fencing, surface opening. Containment berms should be at least 2 feet tall, with sloping sides.

E. When washing concrete to remove fine particles and expose the aggregate, avoid creating erosion by draining the water to the side into a bermed or level area or into a sediment control structure. Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile, or dispose in the trash.

F. Train all applicable employees in proper procedures for washout area use and maintenance.

G. An alternative to areas identified above is to use plastic-lined drop boxes to hold and dispose of wastes. Assure boxes are leak proof and clean up any over splash immediately.

Maintenance/Removal Guidance

A. Clean out designated washout facilities and areas often. Concrete can set, be broken up, and then disposed of properly.

B. Refurbish facilities as needed.

4.2.7 Structure Painting

Purpose

To prevent or reduce the discharge of pollutants to storm water from structure painting.

Conditions Where Practice Applies

A. Any painting operation.

Design Criteria/Specifications

A. Store paints, preparation, cleaning materials and equipment in designated areas. This includes soiled rags, rollers, and other application and cleanup materials. Mix paint indoors, in a containment area, or in a flat unpaved area not subject to significant erosion.

B. Collect solid (paint chips) and liquid wastes from power washing or other structure preparation activities. Collect materials on tarps, canvasses or other materials. Route large quantities of liquid wastes into a collection area where solids can settle out, liquids decanted and solids removed and adequately disposed.

C. Avoid or limit paint application activities on rainy or windy days to avoid rinse off and airborne drift. When possible or necessary, enclose or cover prep or painting operations. Use temporary scaffolding to hang drop cloths or draperies to help enclose work area.

D. Use application equipment and methods that minimize overspray.

E. Recycle or reuse excess materials whenever possible. Properly store and dispose of waste materials generated from the activity. Latex paint may be dried and disposed of in the regular trash.

Maintenance/Removal Guidance

A. Washout paint supplies and spray gun cleanout onto a collection cloth, into a collection bucket, or into an approved sanitary connection.

B. Inspect and maintain application equipment often. Fix any leaks when they occur.

Supplemental Findings and Conclusions - Ordinance No. 99-1013

Ordinance No. 99-1013 Adopts Amendments To The Water Resources, Flood Management And Landslides, Weak Foundation Soils And Erosion Sections Of The Oregon City Comprehensive Plan And Adopts New Provisions Of The Oregon City Municipal Code To Implement The Amendments, Including A New Flood Management Overlay District Chapter, A New Water Quality Resource Area Overlay District Chapter And A New Erosion And Sediment Control Chapter and Amendments to the Land Divisions Title.

I. Introduction

The City of Oregon City is adopting these regulations to protect, maintain and improve water quality in the City and to protect life and property from natural disasters and hazards. In addition, the amendments are adopted to comply with the requirements of Metro's Urban Growth Management Functional Plan (UGMFP).

II. Applicable State Law

The primary applicable Statewide Planning Goals are the water quality portion of Statewide Planning Goal 6 and the flood and steep slopes hazards portions of Statewide Planning Goal 7. Interpretations of the applicability of these Goals are not well developed in Land Conservation and Development Commission (LCDC) rule-making. However, LCDC's 1996 rulemaking on Goal 5, at OAR 660-23-240 clarified the separate relationship of Goal 5 from Goals 6 and 7.

A. Goal 6

The portion of Goal 6 for water quality is as follows:

> "To maintain and improve the quality of the . . . water . . . resources of the state. [Pollutants] from future development, when combined with [pollutants] from existing developments shall not threaten to violate or violate applicable state or federal environmental quality statutes, rules and standards . . .(For) water . . . resources of the applicable . . . river basins . . . included in the state environmental quality statutes, rules, standards and implementation plans, such (pollutants) shall not . . . degrade such resources; or . . . threaten the availability of such resources." (Emphasis added.)

The Department of Environmental Quality (DEQ) list of "water quality limited water bodies," the relevant portions of which are in the record, identifies portions of the Clackamas and Willamette Rivers in the City as being water bodies of limited water quality. This map is a product of state Environmental Quality Commission rulemaking to comply with the federal Clean Water Act. It is evidence of threatened violations of water quality standards from existing development.

Planned future development will add to the threat of water quality standards violations. The regional government, Metro, is requiring increased densities in selected areas inside the regional urban growth boundary (UGB) to increase the efficiency of land use inside the UGB and preserve farmland outside it. (See Title 1 of the UGMFP) Title 3 of the UGMFP was adopted in November, 1996, anticipating the impact of planned future development that could add to the threat of water quality standards violations, to balance the increased density of urban development in Metro's Functional Plan. Ordinance 99-1013 implements Title 3 of the UGMFP.

The regulations in this ordinance are based on the scientific evaluation in the record of the adoption of Metro's adoption on June 18, 1999, of Metro Ordinance No. 98-730C, which is hereby adopted by reference. That scientific evaluation identified effective measures to reduce the impact of future development on water quality. For example, erosion protection prevents additional sediment loads in streams, and development setbacks with vegetated corridors reduce, slow, and clean runoff from additional impervious surfaces that are part of new development. Prohibitions on new uncontained areas of hazardous materials near streams and wetlands prevent new sources of water pollution from new commercial and industrial development.

Consistent with the scientific evaluation, this ordinance will require 50-foot to 200-foot vegetated corridor alongside protected water features. The map of water quality resource areas adopted in Ordinance No. 999-1013 includes the protected water features (streams, wetlands), the vegetated corridors, which comprise the Water Quality Resource Areas, and a 250 foot area around the mapped protected water feature to account for mapping error and for the possible shifting of the location of protected water features.

The extent of regulation in the ordinance is directly related to the identified Goal 6 "threat of violations of water quality standards" and the identified flood hazard areas in the 1995-96 flood events. The application of the requirement for 50- to 200-foot vegetated corridors, for example, is related to the existence of 25% slope hazards and consistent with Metro's Water Quality and Floodplain Management Conservation White Paper in the record (the White Paper). The research contained in the White Paper demonstrates that 50-foot stream buffers are a minimum to provide for runoff filtration for water quality improvement. Moreover, the regulations to control erosion from new development have a clear basis in Goal 6; preventing discharges of sediment into streams that degrade water quality

Finally, Goal 6 Guideline B.1.(2) recognizes that one method for implementing the water quality portion of Goal 6 is to enact "land use controls and ordinances." Thus, this ordinance directly implements the requirements of Goal 6.

B. Goal 7

Goal 7 seeks "To protect life and property from natural disasters and hazards" by prohibiting developments in "areas of natural disasters and hazards without appropriate safeguards." The Goal defines "areas of natural disaster and hazards" to include "areas that are subject to . . . . stream flooding . . . erosion . . . landslides . . .weak foundation soils . . . ."

There are two main data sources identifying flood hazard areas in the record: the Federal Emergency Management Agency (FEMA) 100-year floodplain maps and analysis and Metro's water quality and flood management areas map. The Flood Management Areas are based on these sources with review for areas committed to development. See 17.42.030(A). The primary regulations in Chapter 17.42 to protect flood areas is to maintain the flood capacity of the floodplain by requiring new development to balance fill with an equal or greater amount of excavation. See 17.42.170(D)(2). These regulations apply to all Flood Management Areas identified on the Water Quality and Flood Management Areas Map adopted in Ordinance 99-1013.

The Flood Management Area boundaries are directly related to the data on location of flood hazard, not Goal 5 resource boundaries. The regulation to preserve flood capacity is clearly necessitated by the aerial photographs of actual 1996-96 inundation. The regulations to control erosion from new development also have a basis in Goal 7; areas subject to erosion are defined as hazard areas. Moreover, some portions of the water quality regulations also have significant natural hazards impacts. For example, the 50- to 200-foot vegetated buffers will stabilize stream banks, which will reduce flood hazards and reduce erosive landslides.

C. Goal 5 Consistency

The ordinance is based on Goals 6 and 7 and is consistent with Goal 5, generally and specifically regarding the definition of regionally regulated wetlands.

1. Goal 5 Relationship to Goals 6 and 7

OAR 660-23-240(1) provides that:

> "The requirements of Goal 5 do not apply to the adoption of measures required by Goals 6 and 7. However, to the extent that such measures exceed the requirements of Goals 6 or 7 and affect a Goal 5 resource site, the local government shall follow all applicable steps of the Goal 5 process." (Emphasis added.)

This provision of LCDC's 1996 Goal 5 Rule explicitly recognizes that Goal 6 and 7 regulation may "affect a Goal 5 resource site" without violating Goal 5. The Rule recognizes that a "riparian corridor," including areas adjacent to a river or stream, "is a Goal 5 resource that includes the water areas, fish habitat, adjacent riparian areas and wetlands within the riparian area boundary." OAR 660-23-090. Wetlands are resources regulated by Goal 5, OAR 660-23-100, and by Goals 6 and 7 because wetlands improve water quality and provide flood storage capacity.

Some portions of "riparian corridor" and "wetlands" which are "Goal 5 resource sites" clearly will be "affected" by regulations in Ordinance 99-1013. However, the historic method of subsuming Goal 6 and Goal 7 in the Goal 5 inventory work is not required by the statewide goals. If, as here, analysis of documented water quality threats and documented floods indicates that land use regulations for Goal 6 and 7 purposes are needed in areas that include Goal 5 resource sites, "The requirements of Goal 5 do not apply to the adoption of measures required by Goals 6 and 7." (Emphasis added.) This is the authority for adoption of regulations that implement Goals 6 and 7 without completing the Goal 5 process.

Not all Goal 5 resources, or even all aspects of riparian corridors and wetlands, are affected by Ordinance 99-1013. Section 5 of Metro's Title 3 will require the City to undertake additional fish and wildlife habitat coordination work under Goal 5. This requirement will be accomplished at a later time. See Metro's Ordinance No. 98-730C, Exhibit B. Moreover, only "Title 3 Wetlands," those wetlands of metropolitan concern identified by Metro, are identified by map and regulated by this ordinance. See 17.49.090(D).

Title 3 wetlands are defined in 17.49.020. The Division of State Lands' definition of "wetlands" has been retained to describe all wetlands. "Title 3 wetlands" are wetlands of metropolitan concern regulated by Title 3. The Water Quality and Flood Management Areas Map identifies wetlands of metropolitan concern based on Metro's analysis.

Goal 5 consistency is maintained for this partial regulation of wetlands without going beyond Goal 6 water quality and Goal 7 flood control. Goal 5 consistency is based on the use of the relevant portions of the Division of State Lands' (DSL) 1997 definition of "locally significant wetlands" at OAR 141-86-350(2)(a), (b), and the 1996 Oregon Freshwater Wetland Assessment Methodology. DSL's definition was developed for use with the new Goal 5 Rule provisions on wetlands. The regional wetlands map amendment criteria do not "exceed the requirements of Goals 6 and 7" because they include only the portion of DSL's definition relating to the water quality and flood control (hydrologic) functions of a wetland.

Further, evidence that Ordinance 99-1013's performance standards do not exceed the requirements of Goals 6 and 7 is the City Commission's decision not to make substantive amendments to address Goal 5 - Fish and Wildlife Habitat Conservation. Although the Metro Council has stated that it will require the City to complete work related to Goal 5 in the future, this ordinance has taken no steps to address these concerns. The City does not anticipate pursuing this work until Metro completes its Fish and Wildlife Habitat Conservation work and imposes the requirement on the City.

D. Location of Buildings on Farmland

Title 3 performance standards may affect the location of buildings and structures on farmland. The Oregon Department of Agriculture has authority under ORS 561.191 to regulate water quality programs on farmland. As a result, the Metro Council specifically excluded "farming practices" as defined in ORS 30.930 and "farm uses" as defined in ORS 215.203 from Title 3 regulation. However, buildings associated with farm practices and farm uses can be subject to Title 3 regulations without conflicting with the Oregon Department of Agriculture's statutory authority because the Title 3 regulations will affect only the location of those uses. Title 3 regulations do not prohibit farming practices uses that are otherwise allowed on active farmland.

III Applicable Regional Law

A. History of Title 3 of Metro's Urban Growth Management Functional Plan

The Metro Council adopted the Urban Growth Management Functional Plan in Ordinance No. 96-647C in November, 1996, pursuant to functional plan authority in ORS 268.390. The Functional Plan contains "requirements" for changes in city and county plans to implement the 2040 Growth Concept in Metro's regional goals and objectives.

"Title 3: Water Quality and Flood Management Conservation" was adopted in 1996, but none of the requirements were immediately effective. The requirements of sections 1-4 became effective when the Metro adopted its map of regulated areas and its Model Ordinance. Fish and Wildlife Habitat Conservation is addressed in Section 5 of Title 3. However, section 5 describes future Metro coordination work under Statewide Planning Goal 5 that would result in new performance standards, which will be added to a functional plan at a later time and are not addressed by this ordinance.

III. Consistency with Regional Goals and Objectives

Metro's regional goals and objectives are stated in both acknowledged 1995 Regional Urban Growth Goals and Objectives (RUGGO) and the 1997 Regional Framework Plan that is subject to LCDC acknowledgment. The Urban Growth Management Functional Plan, including Title 3, is intended to implement the 2040 Growth Concept that is included in both plans.

Goal 11.1. of acknowledged RUGGO includes the goal to "maintain and enhance environmental quality." Objective 12, "Watershed Management and Regional Water Quality," includes the objectives in 12.1.1 to "manage watershed to protect, restore and ensure to the maximum extent practicable, the integrity of streams, wetlands and floodplains . . . ," and 1.2 "comply with state and federal water requirements," and 12.1.5 "Encourage the use of techniques relying on natural processes to address flood control . . . ."

The 2040 Growth Concept at Goal 11.4 of RUGGO, p. 28, integrates these Objectives with the need for open spaces to balance selected areas of increased jobs and housing density:

> "Designating these areas as open spaces would have several effects. First, it would remove these land (sic) from the category of urban land that is available for development. The capacity of the UGB would have to be calculated without these, and plans to accommodate housing and employment would have to be made without them. Secondly, these natural areas, along with key rural reserve areas, would receive a high priority for purchase as parks and open space, such as Metro's Greenspaces program. Finally, regulations could be developed to protect these critical natural areas that would not conflict with housing and economic goals, thereby having the benefit of regulatory protection of critical creek areas, compatible low-density development and transfer of development rights to other lands better suited for development."

Title 3 regulation is a subset of "regulations to protect natural areas" based on Goals 6 and 7 and RUGGO Objective 12. The original estimates of "unbuildable lands" in the 1994-95 feasibility analyses of the 2040 Growth Concept included rough estimates of land ultimately to be regulated by Title 3. Adoption of the Title 3 map of regulated areas in this ordinance will enable a more

precise estimate of "unbuildable lands" to be made in the analysis of "vacant lands" inside the urban growth boundary. Flood prone soils were included in the feasibility analyses estimates of Title 3 regulated lands and in the 1997 Urban Growth Report. The more accurate removal of Title 3 regulated lands from urban land will be done in the ongoing review of the urban growth boundary consistent with the RUGGO provision. In any event, the land regulated under Chapter 17.42 is not completely removed from development. Provisional uses are still allowed, as are variances and other methods to allow development in the 50-200 foot vegetated corridor. Moreover, the density may remain the same through the use of density transfers. Finally, because Metro has already included rough estimates of land that would be rendered unbuildable because of regulations adopted by the City to implement Title 3, the adoption of this ordinance does not affect the City's obligations regarding buildable lands.

City of Oregon City

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Oregon City, OR 97045
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Staff Report

File Number: 15-294

Agenda Date: 5/20/2015

Status: Agenda Ready

To: City Commission

Agenda #: 7f.

From: Public Works Director John Lewis

File Type: Ordinance

SUBJECT:
Second Reading of Ordinance No. 15-1006, Adopting Amendments to Oregon City Municipal Code Chapter 13.12, Stormwater Management

RECOMMENDED ACTION (Motion):
Staff recommends the City Commission approve the second reading of Ordinance No. 15-1006, adopting amendments to the Oregon City Municipal Code Chapter 13.12, Stormwater Management.

BACKGROUND:
The City is required to revise and update its stormwater management program in order to comply with the permit requirements under the City's National Pollution Discharge Elimination Systems Permit (NPDES) from the Oregon Department of Environmental Quality (DEQ) and the Federal Environmental Protection Agency (EPA). This ordinance amends OCMC Section 13.12, Stormwater Management to correspond with the revised Public Works Stormwater and Grading Design Standards and Erosion Prevention and Sediment Control Planning Manual, which are being adopted through a separate resolution.

The purpose of OCMC Chapter 13.12 is to define policies, minimum requirements, minimum standards and design procedures and permits for the construction and maintenance of stormwater conveyance and quantity and quality control facilities. It accomplishes this by:

- Minimizing increased stormwater runoff rates from new development so as to minimize the impact upon any downstream natural channel that may exist between the subject area and the Willamette or Clackamas Rivers;
- Preventing water runoff generated by development from exceeding the capacity of downstream stormwater facilities;
- Reducing stormwater runoff rates and volumes, soil erosion and pollution, wherever possible, from developed and developing lands;
- Preventing the uncontrolled or irresponsible discharge of stormwater from new development onto adjoining public or private property;
- Maintaining the integrity of stream channels for their biological functions, as well as for drainage and other purpose.

This chapter is being amended in order to correspond with changes being made within the Public Works Departments key stormwater management documents including the Public Works Stormwater and Grading Design Standards and Erosion Prevention and Sediment Control Planning Manual.

The first reading was approved at the May 6, 2015 City Commission meeting, and staff is now recommending approval of the second reading of the ordinance.

Chapter 13.12 STORMWATER MANAGEMENT

Sections:

13.12.010 Purpose.

13.12.020 Adoption of standards.

13.12.030 Superseding Oregon City Drainage Master Plan Appendix A.

13.12.040 Definitions.

13.12.050 Applicability and exemptions.

13.12.060 Abrogation and greater restrictions.

13.12.070 Severability.

13.12.080 Submittal requirements.

13.12.090 Approval criteria for engineered drainage plans and drainage report.

13.12.100 Alternative materials, alternative design and methods of construction.

13.12.110 Transfer of engineering responsibility.

13.12.120 Standard Construction Specifications.

13.12.130 Administrative provisions.

13.12.140 Maintenance of public stormwater facilities.

13.12.150 Penalties and enforcement.

13.12.160 Hazardous conditions.

13.12.170 Permits from other jurisdictions.

13.12.180 Violation—Penalty.

13.12.010 Purpose.

The purpose of this chapter is to define policies, minimum requirements, minimum standards and design procedures and permits for the construction and maintenance of stormwater conveyance and quantity and quality control facilities in order to:

A. Minimize increased stormwater runoff rates from any development so as to minimize the impact upon any downstream natural channel that may exist between the subject area and the Willamette or Clackamas Rivers;

B. Prevent water runoff generated by development from exceeding the capacity of downstream stormwater facilities;

C. Reduce stormwater runoff rates and volumes, soil erosion and pollution, wherever possible, from developed and developing lands;

D. Prevent the uncontrolled or irresponsible discharge of stormwater from new development onto adjoining public or private property;

E. Maintain the integrity of stream channels for their biological functions, as well as for drainage and other purposes;

F. Have stormwater conveyance facilities of adequate design to manage all volumes of water generated in the contributing drainage area, for both the existing condition and the anticipated future condition;

G. Have all stormwater facilities:

1. Designed to mimic natural hydrologic conditions, to the maximum extent practicable,

2. Designed in a manner to allow economical future maintenance,

2. If city owned or maintained, designed for maintenance with city owned equipment,

3. Designed using materials that will ensure a minimum practical design life of seventy-five years, and

4. Designed to have sufficient structural strength to resist erosion and all external loads (construction, traffic, seismic) which may be imposed;

H. Establish maintenance easements with the owners of privately owned/maintained stormwater facilities to ensure an appropriate level of maintenance and to help minimize public safety hazards;

I. Have all new stormwater facilities comply with applicable National Pollutant Discharge Elimination System (NPDES) requirements;

J. Minimize the deterioration of existing watercourses, culverts, bridges, dams and other structures;

K. Minimize increases in stormwater pollution; and

L. Allow for periodic inspections of both private and public stormwater quantity control and quality control facilities to verify that they are functioning in substantial conformance with the approved design intent.

M. Allow issuance of engineering permits for stormwater work in the right-of-way or public easements either as a separate Public Works permit or as part of overall issued public infrastructure construction plans. The various fees for these permits are approved and modified from time to time by the city commission. Failure to meet the conditions of the issued permit shall constitute a violation of the Municipal Code. (Ord. 99-1029 §2 (part), 1999)

(Ord. No. 10-1003, § 1(Exh. 1), 7-7-2010)

13.12.020 Adoption of standards.

The city commission may establish and modify from time to time by resolution Public Works Stormwater and Grading Design Standards to implement the requirements of this chapter.

(Ord. 99-1029 §2 (part), 1999)

13.12.030 Superseding Oregon City Drainage Master Plan Appendix A.

The policies and standards of this chapter are intended to be consistent with the applicable sections of the Oregon City Drainage Master Plan dated January 1988, and applicable basin master plans, for land drainage and flood control within the Oregon City urban growth area, as adopted by the city. Appendix A of the Oregon City Drainage Master Plan dated January 1988 is superseded by the Public Works Stormwater and Grading Design Standards adopted by resolution and as periodically amended.

(Ord. 99-1029 §2 (part), 1999)

13.12.040 Definitions.

Unless specifically defined below, words and phases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application.

"Applicant" means a person, party, firm, corporation or other legal entity that has applied for a development permit or approval.

"Bulk petroleum storage" means storage of any type of bulk liquid petroleum or petroleum waste materials stored outside in multiple above ground storage tanks (AST). Multiple ASTs include two or more tanks that are either within the same secondary containment structure or within twenty feet of each other.

"Catch basin" means a structure, normally with a sump, for receiving drainage from a gutter or median and discharging the water through a conduit.

"City" means the City of Oregon City.

"City engineer" means the city engineering manager, their duly authorized representative(s), or the city's duly authorized representative(s) as designated by the city manager.

"Clearing" means surface removal of vegetation.

"Constructed wetlands" means wetlands developed as a water quality or quantity facility, subject to maintenance and modification as such. These areas must be clearly defined and/or separated from naturally occurring wetlands or wetlands created for mitigation purposes.

"Contributing drainage area" means the subject property together with the land area contributing runoff to it.

"Conveyance" means a channel or conduit to move water from one point to another point.

"Culvert" means a hydraulically short conduit that conveys surface drainage in artificial or natural watercourses through a roadway embankment or past some other type of flow obstruction.

"Dam" means a water storage structure that may or may not meet Oregon Revised Statute (ORS) requirements for height and storage capacity. All such structures require professional engineer design. If the water storage structure exceeds the ORS criteria for height or storage capacity, then the Oregon State Water Resources Commission shall have approval authority.

"DEQ" means the Oregon Department of Environmental Quality.

"Development" means any manmade change to improved or unimproved real estate, including but not limited to, the construction of building or other structures, utility infrastructure, grading, streets or other structures or facilities, mining, dredging, paving, filling or excavation. Development does not include the following: (1) stream enhancement or restoration projects approved by the city; (2) farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of this chapter.

"Disturb" means man-made changes to the existing physical status of the land that are made in connection with development.

"Drainage feature" means any natural or man-made structure, facility, conveyance or topographic feature which has the potential to concentrate, convey, detain, retain, infiltrate or affect the flow rate of stormwater runoff.

"DSL" means the Oregon Division of State Lands.

"Easement" means the legal right to use a parcel of land for a particular purpose. It does not include fee ownership, but may restrict the owner's use of the land.

"Embankment" means a raised structure of earth, gravel or similar material above the surrounding grade.

"Engineer" means a registered professional engineer licensed by the state of Oregon.

"Enhancement" means the process of improving upon the natural functions and/or values of an area or feature that has been degraded by human activity. Enhancement activities may or may not return the site to a predisturbance condition, but create/recreate processes and features that occur naturally.

"Erosion" means the movement of soil particles resulting from actions of water, wind or mechanical means.

"Excavation" means the mechanical removal of earth material.

"Fill" means any material such as, but not limited to, sand, gravel, soil, rock or gravel that is placed for the purposes of development or redevelopment.

"Floodplain" means the land area identified and designated by the United States Army Corps of Engineers, the Oregon Division of State Lands, the Federal Emergency Management Agency or City of Oregon City that has been or may be covered temporarily by water as a result of a storm event of identified frequency. It is usually the flat area of land adjacent to a stream or river formed by floods.

"Fuel dispensing facilities" means the area (including fuel islands, above ground fuel tanks, fuel pumps, and the surrounding pad) where fuel is transferred from bulk storage tanks to vehicles, equipment, and/or mobile containers.

"Grading" means any excavating, filling, embanking or altering contours of earth material.

"Grubbing" means the removal of vegetative matter from below the surface of the ground, such as sod, stumps, roots, buried logs or other debris, and shall include the incidental removal of topsoil to a depth not exceeding twelve inches.

"Impervious surfaces" means a hard surface area which prevents or retards the entry of water into the soil mantle and/or causes water to run off the surface in greater than natural quantities or at an increased rate. Impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking lots, concrete or asphalt paving, gravel surfaces with compacted subgrade, packed earthen materials and oiled macadam or other surfaces which similarly impede the infiltration of stormwater. Open, uncovered stormwater management facilities shall not be considered impervious surfaces.

"Inlet" means a connection between the surface of the ground and a drain or sewer for the admission of surface and stormwater runoff.

"Maintenance" means any activity that is necessary to keep an existing stormwater facility in good working order so as to function as designed. Maintenance includes complete reconstruction of a stormwater facility, if needed to return the facility to good working order. Maintenance also includes the correction of any problem on the site property that may directly impact the function of the stormwater facilities.

"Maintenance easement" means a binding agreement between the city and the person or persons holding title to a property served by a stormwater facility where the property owner promises to maintain certain stormwater facilities; grants the city the right to enter the subject property to inspect and make certain repairs, or perform certain maintenance procedures on the stormwater control facilities when such repairs or maintenance have not been performed by the property owner; and promises to reimburse the city for the cost should the city perform such repairs or maintenance.

"NPDES" means the National Pollutant Discharge Elimination System. A national permit system that covers discharges to waters of the United States and is enforced under the Federal Water Pollution Control Act, commonly known as the Clean Water Act.

"Owner or property owner" means the person who is the legal record owner of the land, or where there is a recorded land sale contract, the purchaser thereunder.

"Parcel" means a single unit of land that is created by a partitioning of land (ORS 92.010(7)).

"Plans" mean the construction documents and specifications, including system site plans, storm drain plans and profiles, cross sections, detailed drawings, etc. or reproductions thereof, approved or to be approved by the city, county, or state. They will show the location, character, dimensions and details for the work to be done.

"Private stormwater facility" means a stormwater facility located on private property and maintained by private property owners.

"Professional engineer" means a registered professional engineer licensed by the state of Oregon..

"Project engineer" means the professional engineer responsible for the project, who will affix his/her seal on the project drainage plans and drainage analysis and supervise construction of the stormwater facilities. The project engineer shall be licensed in the state of Oregon and qualified by experience or examination.

"Public stormwater facility" means any stormwater facility in the public right-of-way or easement operated and maintained by the city, county or state.

"Record drawings" means a set of engineering or site drawings that show how the project was constructed and what materials were used. Record drawings are signed and dated by the project engineer.

"Restoration" means the process of returning a disturbed or altered area or feature to a previously existing natural condition. Restoration activities reestablish the structure, function, and/or diversity to that which occurred prior to impacts caused by human activity.

"Right-of-way" means all land, or interest therein, which by deed, conveyance, agreement, easement, dedication, usage or process of law is reserved for, or dedicated to, the use of the general public.

"Sedimentation" means the process of gravity deposition of water suspended matter; the process of depositing soil particles, clays, sands and other sediment that were picked up by stormwater runoff.

"Solid waste storage area" means a place where solid waste containers are stored. Solid waste containers include trash compactors, solid waste dumpsters and garbage cans.

"Stormwater" means the surface water runoff that results from all natural forms of precipitation.

"Stormwater facility" means a component of a man-made drainage feature, or features designed or constructed to perform a particular function or multiple functions related to stormwater management. Includes, but is not limited to, pipes, swales, ditches, culverts, street gutters, rain gardens, pervious pavements, green roofs, ponds, constructed wetlands, infiltration devices, catch basins, oil/water separators and sediment basins. Stormwater facilities shall not include building gutters, downspouts, and drains serving one single-family residence.

"Stormwater management" means a program to provide surface water quality and quantity controls through structural and non-structural methods and capital improvement projects. Nonstructural controls include, but are not limited to, maintenance of stormwater facilities, public education, water quality monitoring, and preparation of agreements, ordinances, and regulations.

"Stormwater quality control" means the control of the introduction of pollutants into stormwater and the process of separating pollutants from stormwater.

"Stormwater quantity control" means the control of the rate and/or volume of stormwater released from a development site.

"Stream" means a body of running water moving over the earth's surface in a channel or bed, such as a creek, rivulet or river. It flows at least part of the year, including perennial and intermittent streams. Streams are dynamic in nature and their structure is maintained through build-up and loss of sediment.

"Structure(s)" means a building or other major improvement that is built, constructed or installed, and it also means manmade improvements to land that are used, or expected to be used, in the operation of a utility. It includes buildings, utility lines, manholes, catch basins, driveways and sidewalks. It does not include minor improvements, such as fences, utility poles, flagpoles or irrigation system components that are not customarily regulated through zoning codes.

"Watercourse" means a channel in which a flow of water occurs, either continuously or intermittently, and if the latter with some degree of regularity. Such flow must be in a definite direction.

"Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands are those areas identified and delineated by a qualified wetland specialist as set forth in the 1987 Corps of Engineers Wetland Delineation Manual.

(Ord. 99-1029 §2 (part), 1999)

13.12.50 Applicability and exemptions.

This chapter establishes performance standards for stormwater conveyance, quantity and quality. Additional performance standards for erosion prevention and sediment control are established in OCMC 17.47.

A. Stormwater Conveyance. The stormwater conveyance requirements of this chapter shall apply to all stormwater systems constructed with any development activity, except as follows:

1. The conveyance facilities are located entirely on one privately owned parcel; and
2. The conveyance facilities are privately maintained; and
3. The conveyance facilities receive no stormwater runoff from outside the parcel's property limits.

Those facilities exempted from the stormwater conveyance requirements by the above subsection will remain subject to the requirements of the Oregon Uniform Plumbing Code. Those exempted facilities shall be reviewed by the building official.

B. Water Quality and Flow Control. The water quality and flow control requirements of this chapter shall apply to the following proposed uses or developments, unless exempted under subsection C:

1. Activities located wholly or partially within water quality resource areas pursuant to Chapter 17.49 that will result in the creation of more than five hundred square feet of impervious surface within the WQRA or will disturb more than one thousand square feet of existing impervious surface within the WQRA as part of a commercial or industrial redevelopment project. These square footage measurements will be considered cumulative for any given five-year period; or
2. Activities that create or replace more than five thousand square feet of impervious surface per parcel or lot, cumulated over any given five year period.

C. Exemptions. The following exemptions to 13.12.050(B) apply:

1. An exemption to the flow control requirements of this chapter will be granted when the development site discharges to the Willamette River, Clackamas River or Abernethy Creek;

and either lies within the one hundred year floodplain or is up to ten feet above the design flood elevation as defined in Chapter 17.42, provided that the following conditions are met:

a. The project site is drained by a conveyance system that is comprised entirely of manmade elements (e.g. pipes, ditches, culverts outfalls, outfall protection, etc) and extends to the ordinary high water line of the exempt receiving water; and

b. The conveyance system between the project site and the exempt receiving water has sufficient hydraulic capacity and erosion stabilization measures to convey discharges from the proposed conditions of the project site and the existing conditions from non-project areas from which runoff is collected.

2. Projects in the following categories are generally exempt from the water quality and flow control requirements:

a. Stream enhancement or restoration projects approved by the city;

b. Farming practices as defined by ORS 30.960 and farm use as defined in ORS 214.000; except that buildings associated with farm practices and farm use are subject to the requirements of this chapter,

c. Actions by a public utility or any other governmental agency to remove or alleviate an emergency condition,

d. Road and parking area preservation/maintenance projects such as pothole and square cut patching, surface sealing, replacing or overlaying of existing asphalt or concrete pavement, provided the preservation/maintenance activity does not expand the existing area of impervious coverage above the thresholds in 13.12.050(B).

e. Pedestrian and bicycle improvements (sidewalks, trails, pathways, and bicycle paths/lands) where no other impervious surfaces are created or replaced, built to direct stormwater runoff to adjacent vegetated areas.

f. Underground utility projects that replace the ground surface with in-kind material or materials with similar runoff characteristics.

g. Maintenance or repair of existing utilities.

D. Uses Requiring Additional Management Practices. In addition to any other applicable requirements of this chapter, the following uses are subject to additional management practices, as defined in the Public Works Stormwater and Grading Design Standards:

a. Bulk Petroleum Storage facilities;

b. Above ground storage of liquid materials;

c. Solid waste storage areas, containers, and trash compactors for commercial, industrial, or multi-family uses;

d. Exterior storage of bulk construction materials;

e. Material transfer areas and loading docks;

f. Equipment and/or vehicle washing facilities;

g. Development on land with suspected or known contamination;

h. Covered vehicle parking for commercial or industrial uses.

i. Industrial or commercial uses locating in high traffic areas, defined as average daily count trip of 2,500 or more trips per day, and

j. Land uses subject to DEQ 1200-Z Industrial Stormwater Permit Requirements.

(Ord. 99-1029 §2 (part), 1999)

13.12.060 Abrogation and greater restrictions.

Where the provisions of this chapter are less restrictive or conflict with comparable provisions of other portions of this code, regional, state or federal law, the provisions that are more restrictive shall govern. Where this chapter imposes restrictions that are more stringent than regional, state or federal law, the provisions of this chapter shall govern. However, nothing in this chapter shall relieve any party from the obligation to comply with any applicable federal, state or local regulations or permit requirements.

Compliance with this chapter and the minimum requirements, minimum standards, and design procedures as set forth in the city's adopted Public Works Stormwater and Grading Design Standards does not relieve the designer, owner, or developer of the responsibility to apply conservative and sound professional judgment to protect the health, safety and welfare of the public. It is not the intent of this chapter to make the city a guarantor or protector of public or private property in regard to land development activity.

(Ord. 99-1029 §2 (part), 1999)

13.12.070 Severability.

The provisions of this chapter are severable. If any section, clause, or phrase of this chapter is adjudged invalid by a court of competent jurisdiction, the decision of that court shall not affect the validity of the remaining portions of this ordinance.

(Ord. 99-1029 §2 (part), 1999)

13.12.080 Submittal requirements.

A. Applications subject to stormwater conveyance, water quality, and/or flow control requirements of this chapter shall prepare engineered drainage plans, drainage reports, and design flow calculation reports in compliance with the submittal requirements of the Public Works Stormwater and Grading Design Standards.

B. Each project site, which may be composed of one or more contiguous parcels of land, shall have a separate valid city approved plan and report before proceeding with construction.

(Ord. 99-1029 §2 (part), 1999)

13.12.90 Approval criteria for engineered drainage plans and drainage report.

An engineered drainage plan and/or drainage report shall be approved only upon making the following findings:

A. The plan and report demonstrate how the proposed development and stormwater facilities will accomplish the purpose statements of this chapter;

B. The plan and report meet the requirements of the Public Works Stormwater and Grading Design Standards adopted by resolution under Section 13.12.020

C. The storm drainage design within the proposed development includes provisions to adequately control runoff from all public and private streets and roof, footing, and area drains and ensures future extension of the current drainage system.

D. Streambank erosion protection is provided where stormwater, directly or indirectly, discharges to open channels or streams.

E. Specific operation and maintenance measures are proposed that ensure that the proposed stormwater quantity control facilities will be properly operated and maintained.

(Ord. 99-1029 §2 (part), 1999)

13.12.100 Alternative materials, alternative design and methods of construction.

The provisions of this chapter are not intended to prevent the use of any material, alternate design or method of construction not specifically prescribed by this chapter or the Public Works Stormwater and Grading Design Standards, provided any alternate has been approved and its use authorized by the city engineer. The city engineer may approve any such alternate, provided that the city engineer finds that the proposed design is satisfactory and complies with the intent of this chapter and that the material, method, or work offered is, for the purpose intended, at least the equivalent of that prescribed by this chapter in effectiveness, suitability, strength, durability and safety. The city engineer shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding its use. The details of any action granting approval of an alternate shall be recorded and entered in the city files.

(Ord. 99-1029 §2 (part), 1999)

13.12.110 Transfer of engineering responsibility.

Project drainage plans shall always have a project engineer. If the project engineer is changed during the course of the work, the city shall be notified in writing and the work shall be stopped until the replacement engineer has agreed to accept the responsibilities of the project engineer. The new project engineer shall provide written notice of accepting project responsibility to the city within seventy-two hours of accepting the position as project engineer.

(Ord. 99-1029 §2 (part), 1999)

13.12.120 Standard Construction Specifications.

The workmanship and materials shall be in accordance with the edition of the "Standard Specifications for Public Works Construction," as prepared by the Oregon Chapter of American Public Works Association (APWA) and as modified and adopted by the city, in effect at the time of application. The exception to this requirement is where this chapter and the Public Works Stormwater and Grading Design Standards provide other design details, in which case the requirements of this chapter and the Public Works Stormwater and Grading Design Standards shall be complied with.

(Ord. 99-1029 §2 (part), 1999)

13.12.130 Administrative provisions.

An applicant shall submit the following additional items to the city and complete the following tasks prior to proceeding with construction of proposed development plans. These items include the following:

A. Engineer's cost estimate (also may be known as engineer's opinion of probable construction cost);

B. Plan check and inspection fees (as set by city resolution);

C. Certificate of liability insurance for city funded public projects contracted by the city (not less than one million dollars single incident and two million dollars aggregate);

D. Preconstruction meeting (if required by some other provision of this code);

E. Performance Assurance(s). Applicant must submit a letter of commitment, cash deposit or other form of assurance in form and substance satisfactory to the city engineer and city attorney, to cover the engineer's cost estimate for the construction of the stormwater facility. This is required to assure that the following are accomplished to the satisfaction of the city engineer:

1. Work shown on the development plans is accomplished,
2. Appropriate as-built/record drawings and electronic files are delivered to the city. (As-built drawings, or record drawings, will be on four-mil Mylar.) Electronic files shall be submitted per city engineer format requirements,
3. Compliance with the criteria in this chapter and the Public Works Stormwater and Grading Design Standards, as well as with other city standards, ordinances, resolutions or rules,
4. Permanent stabilization and/or restoration of the impact from the development,
5. Fulfillment of all conditions of approval,
6. Payment of all outstanding fees,
7. Submittal of any required maintenance guarantee(s);

F. Developer/engineer agreement for public works improvements;

G. Land division compliance agreement (if applicable);

H. Project engineer's certificate of completion;

I. Operation and maintenance easement (if applicable);

J. Details on individual items required by this subsection can be obtained by contacting the city's engineering division. Many items, such as the engineer's cost estimate and plan check and inspection fee, maybe be submitted in conjunction with documentation for other infrastructure improvements that are done with the development (such as street, sanitary sewer, and water).

(Ord. 99-1029 § 2 (part), 1999)

13.12.140 Maintenance of public stormwater facilities.

A. A stormwater facility that receives stormwater runoff from a public right-of-way shall be a public facility. Upon expiration of the warranty period and acceptance by the city as described below, the city shall be responsible for maintenance of those public stormwater facilities. Access for maintenance of the stormwater facilities shall be provided to the city through the granting of a stormwater easement or other means acceptable to the city.

B. Responsibility for maintenance of stormwater facilities including all landscaping, irrigation systems, structures and appurtenances shall remain with the property owner/developer for two years (known as the warranty period). The owner/developer shall provide the city a separate two-year landscaping maintenance bond for one hundred ten percent of the landscaping cost. Transfer of maintenance of stormwater conveyance systems shall occur when the city accepts the stormwater conveyance system.

C. The city will perform an inspection of the development's entire publicly maintained stormwater system approximately forty-five days before the two-year warranty period expires. The stormwater system must be found to be in a clean, functional condition by the city engineer before acceptance of maintenance responsibility by the city.

(Ord. 07-1011, 2007; Ord. 99-1029 § 2(part), 1999)

13.12.145 Maintenance of private stormwater facilities.

A. An applicant shall submit an operation and maintenance plan for each proposed stormwater facilities, unless exempted in the Public Works Stormwater and Grading Design Standards. The information in the operation and maintenance plan shall satisfy the requirements of the Public Works Stormwater and Grading Design Standards.

B. Private owners are required to inspect and maintain stormwater facilities on their property in accordance with an approved operation and maintenance plan. A maintenance log Is required to document facility inspections and specific maintenance activities. The log shall be available to city inspection staff upon request.

C. Failure to operate or maintain a stormwater facility according to the operation and maintenance plan may result in an enforcement action under Section 13.12.150.

13.12.150 Penalties and enforcement.

A. The city is authorized to make inspections and take such actions as required to enforce the provisions of this chapter. The city has the authority to enter onto land for the purpose of inspecting site development activities or resulting improvements. City staff will make an effort to contact the property owner before entering onto that property.

B. If the city engineer determines a site has any unpermitted or illegal facilities placed, constructed or installed on the site, then the city engineer shall notify the owner in writing directing the owner to submit a written plan (with construction drawings completed by a professional engineer, if otherwise required by this chapter) within ten calendar days. This plan (and drawings, if required) shall depict the restoration or stabilization of the site or correct the work that has adversely impacted adjacent or downstream property owners. The city engineer shall review the plan (and drawings, if required) for compliance with city standards and issue comments for correction, if necessary, or issue an approval to the owner. The city shall establish a fee by resolution for such review, with all costs borne by the owner. If the required corrective work constitutes a grading permit, then the city shall collect the appropriate grading permit fee.

C. Any person, firm, corporation or entity violating any of the provisions of this chapter, whether they be the property owner, the applicant, the contractor or any other person acting with or without the authorization of the property owner or applicant, shall be subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24

(Ord. 99-1029 § 2 (part), 1999)

13.12.160 Hazardous conditions.

A. Determination and Notification. If the city engineer determines that any excavation, embankment, erosion/sedimentation control or drainage facility is a safety hazard; endangers property; or adversely affects the safety, use or stability of a public way, water quality resource areas (pursuant to Section 17.49) or drainage course, the owner(s) of the subject property and/or the person or agent in control of the property shall be required to repair or eliminate the hazard in conformance with the requirements of this chapter and the Public Works Stormwater and Grading Design Standards. At the time that the city engineer makes the determination that a hazardous condition exists, the property owner and/or person or agent in control of the property will be notified in writing that the hazard exists.

B. Order to Correct. The city engineer will order the specific work to be undertaken or will order that an engineering design be submitted for review and approval by the city engineer, and will specify the time periods within which the hazardous conditions be repaired or eliminated. In the event that the

owner and/or the person or agent in control of the property fails to comply with this order, that person shall be subject to the code enforcement procedures of Chapters 1.16, 1.20, and 1.24

(Ord. 99-1029 §2 (part), 1999)

13.12.170 Permits from other jurisdictions.

A. The Oregon State Department of Environmental Quality (DEQ) currently issues NPDES 1200-C permits for projects that cover areas of one acre or greater. No permit shall be issued for projects of this size (or any other size as modified by DEQ) without a copy of said DEQ permit being on file with Oregon City. DEQ is responsible for policing its own permits, however, if city personnel observe conditions that are believed to be in violation of any such permit, and cannot get corrections made, the city will bring such conditions to the attention of the appropriate DEQ representatives.

B. Projects may require Oregon State Division of State Lands (DSL) and/or United States Army Corps of Engineers (USACE) permits. If such permits are required, no permission to construct will be granted until such a time as a copy of such permit is on file with the city or notice is received from those agencies that a permit is not required. DSL/USACE is responsible for enforcing its own permits, however, if city personnel observe conditions that are believed to be in violation of any such permit, and cannot get corrections made, the city will bring such conditions to the attention of the appropriate DSL/USACE representatives.

C. Projects may require Oregon State Department of Fish and Wildlife (ODFW) permits. When ODFW permits are required, no work will be authorized until the receipt of a copy of the ODFW permit. ODFW is responsible for policing its own permits, however, if city personnel observe conditions that are believed to be in violation of any such permit, and cannot get corrections made, the city will bring such conditions to the attention of the appropriate ODFW representatives.

(Ord. 99-1029 §2 (part), 1999)

13.12.180 Violation—Penalty.

Any act or omission in violation of this chapter shall be deemed a nuisance. Violation of any provision of this chapter is subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24.

(Ord. No. 10-1003, § 1(Exh. 1), 7-7-2010)

GSB:7047664.1

City of Oregon City

625 Center Street
Oregon City, OR 97045
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Staff Report

File Number: 15-295

Agenda Date: 5/20/2015

Status: Agenda Ready

To: City Commission

Agenda #: 7g.

From: Public Works Director John Lewis

File Type: Resolution

SUBJECT:
Resolution No.15-14, Adopting City of Oregon City Public Works Stormwater and Grading Design Standards and Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual Coupled With an Oregon City Addendum

RECOMMENDED ACTION (Motion):
Staff is recommending a resolution adopting the recent revisions to the City's Public Works Stormwater and Grading Design manual in order to comply with parts the City's National Pollution Discharge Elimination Systems Permit (NPDES) from the Oregon Department of Environmental Quality (DEQ) and the Federal Environmental Protection Agency (EPA). Additionally, staff recommend to concurrently adopt the revised Clackamas Erosion Prevention and Sediment Control Planning and Design Manual and Oregon City Addendum.

BACKGROUND:
Stormwater management is a key element in maintaining and enhancing livability within the City of Oregon City. Properly managing stormwater is vital to protecting our water resources for a great number of uses, including fish and wildlife habitat, recreation, and drinking water.

The goal of these updated standards is to provide local engineers, developers, builders, and City staff clear guidance in planning and designing stormwater conveyance and management systems that are appropriate to the local climate, hydrogeology, and geology. These standards apply to public and private projects throughout the City and are required under the City's existing NPDES Permit. The primary changes to the standards required to the City to address two key aspects of stormwater management; addressing hydro modification and increasing water quality. These two principles can be addressed by actively promoting Low Impact Development as the preferred standard, where feasible, within Oregon City.

Staff has already conducted one developer outreach workshop, presented the modifications to the City's Natural Resource Committee and the Citizen Involvement Committee, all of which have recommend supporting the revisions.

This resolution is in conjunction with Ordinance No. 15-1006, Adopting Amendments to Oregon City Municipal Code Chapter 13.12, Stormwater Management.



Stormwater and Grading Design Standards

February 2015

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ACRONYMS AND ABBREVIATIONS

2h:1v	two-horizontal to one-vertical
4h:1v	four-horizontal to one-vertical
AASHTO	American Society of State Highway and Transportation Officials
AC	asphalt concrete
ADT	Average Daily Traffic
ASTM	American Society of Testing and Materials
BMP	Best Management Practice
cfs	cubic feet per second
City	City of Oregon City
CFR	Code of Federal Regulations
CMP	corrugated metal pipe
CPEP	corrugated high-density polyethylene
CWA	Federal Clean Water Act of 1972
ESC	erosion and sediment control
ESCP	erosion and sediment control plan
Erosion Standards	*City of Oregon City, Public Works Erosion and Sediment Control Standards*
FEMA	Federal Emergency Management Agency
fps	feet per second
gpm	gallons per minute
HDPE	high-density polyethylene
HGL	hydraulic grade line
LID	Low Impact Development
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NROD	Natural Resource Overlay District
O&M	operation and maintenance
OCMC	Oregon City Municipal Code
ODEQ	Oregon Department of Environmental Quality
ODSL	Oregon Department of State Lands
ODOT	Oregon Department of Transportation
OPC	Oregon Plumbing Code
ORS	Oregon Revised Statutes

OSC	Oregon Structural Code
PC	Point of Curvature
ppm	parts per million
PT	Point of Tangency
PVC	poly-vinyl chloride
RCB	reinforced concrete box
ROW	right-of-way
SF	square feet
SPCC	spill prevention, countermeasure, and containment
SWMM	Stormwater Management Model
SWMP	Stormwater Management Plan
Tc	time of concentration
TR-55	Technical Release 55
UIC	Underground Injection Control
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WPCF	water pollution control facility
WQRA	Water Quality Resource Area

FORWARD

Pursuant to Oregon City Municipal Code (OCMC) 13.12.020 these Stormwater and Grading Design Standards have been developed to implement the Stormwater Management standards as outlined in OCMC 13.12.

Stormwater management is a key element in maintaining and enhancing livability within the City of Oregon City (City). There is a direct link between stormwater runoff and the City's surface and ground water quality and quantity. As land is developed, creation of new impervious surfaces and loss of vegetation increases stormwater runoff during rainfall events, altering the natural hydrologic cycle. Without stormwater management, the increase in flows erodes stream channels and limits groundwater recharge. In addition, runoff that flows over roadways, parking areas, rooftops, and other impervious surfaces collects pollutants that are transported within the watershed to streams, rivers, and groundwater resources. Properly managing stormwater is vital to protecting our water resources for a great number of uses, including fish and wildlife habitat, recreation, and drinking water.

The Federal Clean Water Act of 1972 (CWA) established a national commitment to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The CWA prohibits the discharge of pollutants into water of the United States, unless the discharge is in compliance with a **National Pollutant Discharge Elimination System (NPDES) Permit**. The CWA requires cities such as Oregon City to obtain an NPDES permit for discharge from the **Municipal Separate Storm Sewer System (MS4)**. The City's MS4, which is comprised of catch basins, pipes, ditches, stormwater management facilities, and other structures, conveys runoff from private and public properties within the City and drains directly into the Willamette River, Clackamas River, and other local waterways such as Abernethy Creek. The Oregon Department of Environmental Quality (ODEQ) administers the state's NPDES program and issues NPDES permits on the the federal government's behalf. The City was reissued its current NPDES MS4 permit in 2012, which requires the City to implement a comprehensive stormwater management program, including establishing controls for stormwater runoff from developing areas.

The City's stormwater management standards, set forth in OCMC 13.12 and these Stormwater and Grading Design Standards, emphasize low-impact development (LID) practices, source controls for higher pollutant generating activities, erosion prevention and sediment controls, and operation and maintenance practices designed to properly manage stormwater runoff and protect our water resources. **Each of these measures have been or are being implemented as direct requirements under the City's existing NPDES MS4 permit.**

The goal of these updated standards is to provide local engineers, developers, builders, and City staff clear guidance in planning and designing stormwater conveyance and management systems that are appropriate to the local climate, hydrogeology, and geology. These standards apply to public and private projects throughout the City.

DEFINITIONS

Applicant – Is any person who applies for an approval and/or permit from the City.

Approved Point of Discharge – A location down slope from a development that the City has deemed adequate to accept stormwater flows from all or a portion of the development area.

BMP Sizing Tool – A computer program, approved by the City, for use in calculating the required size of stormwater management facilities. This tool is limited to a set list of pre-defined stormwater management facilities.

Contractor – A person duly licensed or approved by the State of Oregon to perform the type of work to be done under a permit or contract.

Design Storm – The distribution of rainfall intensity over time, identified to have a probability of recurrence, given in years (i.e., five-year design storm).

Detention – The release of surface water runoff from a site at a slower rate than it is collected by the drainage system, the difference being held in temporary storage.

Development – Any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, utility infrastructure, streets or other structures or facilities, mining, dredging, paving, filling, or excavation. Development does not include the following: (1) stream enhancement or restoration projects approved by the city; (2) farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of this chapter.

Director – The City's Public Works Director, or designated representative.

Discharge – Any addition of water, stormwater, wastewater, process water or any pollutant or combination of pollutants to waters of the State, directly or indirectly, by actions of dumping, spilling, disposing or physically connecting to the public storm system or natural drainage conveyance.

Drainageway – A natural or manmade channel formed by existing or manmade topography which directs and/or carries surface or stormwater runoff.

Drywell – An approved receptacle used to receive storm, surface and other water, the sides and bottom being porous, permitting the contents to seep into the ground. A drywell must conform to local agency standards and ODEQ Underground Injection Control standards.

Easement – A permanent or temporary interest or right to lay down, construct, reconstruct, replace, operate, inspect and perpetually maintain storm drainage or surface water pipelines, and all related facilities through, under and along a described property, either public or private.

Engineer – A registered professional engineer licensed to practice in the State of Oregon.

Erosion – The visual or measurable movement of soil particles resulting from the flow of, or pressure from, water, wind, or earth movement.

Government Agency – Any municipal or quasi-municipal jurisdiction, County, State or Federal agency.

Hazardous Materials – Materials described as hazardous by ODEQ, including any toxic chemicals listed as toxic under Section 307(a) of the Clean Water Act or Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA).

Highly Erodible – Soils with erosion (K) factors greater than 0.25, as listed in the Soil Survey of Clackamas County Area, Oregon, developed by the Natural Resource Conservation Service.

Hydromodification – The effects of hydrologic changes to the natural environment caused by changes in runoff and/or discharge patterns. These effects include increased erosion of streambanks, increased incision and/or aggradation of stream channels, reduction of high value riparian habitat, impacts to aquatic organisms, and degradation of water quality.

Impervious Surface – A hard surface area which prevents or retards the entry of water into the soil mantle and/or causes water to run off the surface in greater than natural quantities or at an increased rate. Impervious surfaces may include, but are not limited to, rooftops, walkways, patios, driveways, parking lots, concrete or asphalt paving, gravel surfaces with compacted subgrade, packed earthen materials and oiled macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered stormwater management facilities shall not be considered impervious surfaces.

Industrial Waste – Any liquid, gaseous, radioactive or solid waste substance, or a combination thereof, resulting from any process of industry, manufacturing, trade or business, or from the development or recovery of any sensitive areas, or as defined by ODEQ or the United States Environmental Protection Agency, exclusive of domestic sewage.

Infiltration System – A drainage facility designed to use the hydrologic process of surface and stormwater runoff soaking into the ground to dispose of surface and stormwater runoff.

Inspector – A person authorized by the City, County, or State to enter upon public or private property to inspect construction sites and activities related to these standards.

Intermittent Streams – Streams and springs that consistently do not have year-round water or saturated soil within their channel or swale in a year with wet to average precipitation patterns. Intermittent flow must occur with some degree of regularity and must be in a definite direction. **Section 3.5.3** provides the methodology for determining intermittent status.

Landscape Architect – A registered Landscape Architect licensed to practice in the State of Oregon.

Low Impact Development (LID) – A sustainable site design and development approach that is used to replicate the natural watershed functions and/or address targeted watershed goals and objectives, including protection of existing sensitive areas.

LID Facility – A stormwater facility that mimics natural surface hydrological functions through infiltration or evapotranspiration, or that involves stormwater reuse. Examples of LID facilities are included in **Chapter 4**.

Manufactured Treatment Device – A manufactured device, often proprietary, in which stormwater receives treatment before being discharged to the conveyance system, another stormwater management facility, or to the receiving water. This is a broad category of stormwater management facilities with a variety of pollutant removal mechanisms and varying pollutant removal efficiencies.

Minor Modification – A slight change or alteration made to the standards during the construction phase of a development that does not change the functionality, maintenance or intent of the standards.

Municipal Separate Stormwater System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) as defined in 40 CFR 122.26(b)(8).

National Pollutant Discharge Elimination System, or NPDES, Permit – A permit issued pursuant to Chapter 402 of the Clean Water Act (40 CFR 122, 123, 124, and 504).

Owner – The owner(s) of record title or the purchaser(s) under a recorded sale agreement and other persons having an interest of record in the described real property.

Parcel of Land – A lot, parcel, block or other tract of land that may be occupied by a structure or structures or other use, and includes yards and other undeveloped areas required under the zoning, subdivision or other development ordinances.

Perennial Streams – Streams and springs that have year-round water or saturated soil within the channel, in a year with wet to average precipitation patterns. A stream will be considered perennial unless determined to be intermittent using one of the criteria outlined in **Section 3.5.3**.

Permit – Any authorization required pursuant to these standards or any other regulation.

Permittee – The person to whom a building permit, development permit or any other permit described in these standards is issued.

Person – Any individual or legal entity.

Plant Community – A grouping of plants that often occur together growing in a uniform habitat.

Pollutant – Any of the following, but not restricted to: oil, grease, soil, mining waste, spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, heavy metals, asbestos, wrecked or discharged equipment, cellar dirt and untreated industrial, municipal and agricultural discharges into water.

Porous Pavement – Surface to walk, drive or park on that may reduce stormwater runoff by allowing water to soak into the ground. Examples are permeable pavers, pervious concrete, porous asphalt and gravel.

Post-developed Conditions – Conditions after development.

Pre-developed Conditions – The conditions of the land prior to the original development. For the purpose of hydrological evaluations the pre-developed conditions will use the historical vegetation which existed in the different regions of the City prior to the original development.

Pretreatment or Treatment – The reduction of the amount of pollutants to the MEP, the elimination of pollutants, or the alteration of the nature of pollutant properties in water to a less harmful state.

Private Storm System – That portion of the storm system owned and/or located outside the public right-of-way.

Public Stormwater System – In general those portions of the stormwater conveyance systems that are within a dedicated right-of-way, or within a public stormwater easement. Public stormwater systems also include those stormwater conveyance systems that are within dedicated right-of-way and permitted by another jurisdictional agency such as ODOT, County, etc.

Public Right-of-Way – A right-of-way on which legal right of passage has been given to the public and is under City, County, State or Federal jurisdiction.

Redevelopment – See Development.

Retention – The process of collecting and holding surface water runoff from a design storm with no surface outflow.

Retrofit – The creation or modification of an urban runoff management system in a previously developed area. A retrofit can consist of the construction of a new stormwater management facility

in a developed area, the enhancement of an existing runoff management structure, or a combination of improvement and new construction.

Sensitive Areas – Sensitive Areas include:

a. Existing or created wetlands, including all mitigated wetlands; limits defined by wetlands reports approved by both the ODSL and/or the City.

b. Rivers, streams, sloughs, swamps, creeks; limits defined by the top of the bank or first break in slope measured upland from the mean high water line;

c. Impoundments (lakes and ponds); limits defined by the top of the bank or first break in slope measured upland from the mean high water line.

Sensitive areas shall not include stormwater management facilities including constructed wetlands, rain gardens, and detention ponds, vegetative buffers adjacent to sensitive areas, or water features, such as lakes, constructed during an earlier phase of a development for specific purposes such as recreation.

Source Control – Stormwater management facilities and/or specific actions taken that attempt to control high risk pollutant loading from entering the stormwater runoff through site activities and site design.

Standards – The adopted principles and policies established by the City to meet the intent of preserving water quality and minimizing the impacts development has on the environment.

Storm Drainage/Storm Sewer – A pipe or drainageway or any method of conveyance that carries stormwater, surface runoff, or drainage.

Stormwater – Waters on the surface of the ground resulting from precipitation.

Stormwater Management – A program to provide surface water quality and quantity controls through structural and nonstructural methods and capital improvement projects. Examples of Structural controls include the facilities included in Chapter 4 of this manual as well as structural source control measures, such as covers and awnings, curbs for isolation, spill control manholes, and shut-off valves described in Chapter 6. Nonstructural controls include maintenance of surface water facilities, public education, water quality monitoring, implementation of intergovernmental agreements to provide for regional coordination, and preparation of water quality control ordinances and regulations.

Stormwater Management Facility – Any structure or drainageway that is designed, constructed, and maintained to collect, filter, retain, or detain surface water runoff during and after a storm event for the purpose of controlling flows and/or reducing pollutants in stormwater runoff. It may include, but is not limited to constructed wetlands, rain gardens, water quality swales, stormwater planters, infiltration systems, and ponds.

Stormwater Management Plan (SWMP) – Proposed stormwater plan approved and/or permitted by the City which provides for storm or surface water infiltration, water quality and flow control as provided within these standards.

Stream – A surface concentration of flow in a channel or swale in which flow of water occurs either perennially or intermittently. For the purposes of this manual, streams refer to drainageways that are determined to be jurisdictional by ODSL or USACE.

Undue Hardship – Special or specified circumstances that compel an applicant for development to request a modification of these standards so as to avoid an unreasonable or disproportionate burden

or obstacle to development. The financial viability of meeting the requirements of these design standards is not in itself a justification of undue hardship.

Vegetated Buffer – A corridor adjacent to a sensitive area that is preserved and maintained to protect riparian area functions. Refer to OCMC Title 17 for dimensions and locations of regulated vegetated buffers.

Vegetated Corridor – See Vegetated Buffer.

Water Quality Resource Areas – Areas as defined on the Water Quality and Flood Plain Management Areas Map adopted by Metro or Clackamas County and amended.

Waters of the State – Those waters defined in ORS Chapter 468B.005 or as amended which include lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Pacific Ocean within the territorial limits of the State of Oregon, and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters which do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction.

Wetland – Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are those areas identified and delineated by a qualified wetlands specialist as set forth in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands, January 1987, or by an ODSL/USACE 404 permit. Wetlands may also consist of:

a. *Constructed Wetlands.* As defined in Section 404 of the Clean Water Act, constructed wetlands are those areas developed as a water quality or quantity facility, subject to maintenance as such. These areas must be clearly separated from existing or created wetlands.

b. *Created Wetlands.* Created wetlands are those wetlands developed in an area previously identified as a non-wetland to replace or mitigate wetland destruction or displacement.

c. *Existing Wetlands.* Existing wetlands are those identified and delineated as set forth in the Federal Manual for Identifying the Delineating Jurisdictional Wetlands, January 1987, or as amended, by a qualified wetlands specialist.

Wet Pond – A constructed treatment facility where a portion of the facility is dedicated to being an open body of water.

Wet Weather Measures – Erosion prevention and sediment control methods deemed necessary to meet the types of conditions that occur during the wet weather season, as identified in the City's current erosion control manual.

Wet Weather Season – The portion of the year when rainfall amounts and frequency tend to have the most significant effect on erosion prevention and sediment control (October 1 to May 31).

Work Area – Areas of disturbance for activities defined under "Development". Work area includes areas used for storage of equipment or materials that are used for these activities.

CHAPTER 1

General Information

CHAPTER 1. GENERAL INFORMATION

The Stormwater and Grading Design Standards describe requirements and methods for minimizing the impacts of development within the City of Oregon City (City). Implementing these standards will help protect water resources which, in turn, will benefit human health, fish and wildlife habitat, recreational resources, and drinking water.

This chapter describes the purpose, applicability, jurisdictional, and administrative requirements of the Stormwater and Grading Design Standards.

1.1 Purpose of the Stormwater and Grading Design Standards

The purposes of the Stormwater and Grading Design Standards include but are not limited to, the following:

- Meet federal and state National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permitting requirements.
- Minimize the introduction of pollutants and provide water quality treatment of stormwater runoff to preserve the beneficial uses of drainageways, lakes, ponds, wetlands, and other sensitive areas.
- Enhance water quality by protecting sensitive areas and the required vegetative buffers.
- Reduce stormwater runoff volumes and maximize groundwater recharge through the process of infiltration of runoff into vegetated stormwater facilities.
- Maintain the pre-development stormwater runoff characteristics to minimize effects on the drainageways such as sediment transport, erosion, and degradation generally associated with urbanization, through the use of Low Impact Development (LID) facilities and/or flow controls to address hydromodification.
- Protect the safety of persons and property by safely conveying all stormwater runoff from site development and preventing the uncontrolled or irresponsible discharge of stormwater onto adjoining public or private property.
- Provide for orderly development by preserving the drainageways and natural conveyance systems created by the existing topography and creating man-made conveyance systems with adequate capacity for future development upstream.
- Construct stormwater management facilities which are safe, effective, and economical to maintain and minimize future replacement costs.
- Provide guidance to designers and engineers in meeting the requirements of stormwater regulations when developing land and constructing infrastructure within the City of Oregon City.

1.2 Applicability of the Stormwater and Grading Design Standards

These standards are intended for use by property owners, developers, and design professionals as general design guidelines for all publicly and privately-owned and maintained stormwater management facilities within the City.

All development, as defined by the City, is subject to the requirements of these standards during the land use decision and permitting processes. These processes generally include all land use proposals, site development and permit approvals within, or proposed to be within City boundaries.

All private storm drains outside the building envelope shall be designed using these standards, along with the Oregon Structural Code (OSC), Oregon Plumbing Code (OPC), and/or other applicable codes as appropriate.

1.2.1 General Thresholds

The site development thresholds and applicability of these standards are as follows:

A. Development activities that result in **5,000 square feet of new or replaced impervious surface,** cumulative over a 5-year period, are subject to the requirements of these standards.

B. Development activities that will result in the **creation of more than 500 square feet of new impervious surface within a water quality resource areas (WQRA)** (as defined by Oregon City Municipal Code [OCMC] 17.49), cumulative over a 5-year period, are subject to the requirements of these standards.

C. Development activities that will **disturb 1,000 square feet of existing impervious surface within a WQRA as part of a commercial or industrial redevelopment**, cumulative over a 5-year period, are subject to the requirements of these standards.

D. All development that results in **1,000 square feet of new or replaced impervious surface shall be subject to the erosion prevention and sediment control requirements** outlined in **Chapter 7**.

E. All site **development that results in any new or replaced impervious surfaces and is categorized as high risk for increased pollutant loading** in stormwater runoff is required to comply with **Chapter 6** in addition to all requirements within these standards. High-risk sites, as defined in Chapter 6, include the following site use categories:

- Fuel Dispensing Facilities and Surrounding Traffic Areas
- Above-Ground Storage of Liquid Materials
- Solid Waste Storage Areas, Containers, and Trash Compactors
- Exterior Storage of Bulk Materials
- Material Transfer Areas/Loading Docks
- Equipment and/or Vehicle Washing Facilities
- Development on Land With Suspected or Known Contamination
- Covered Vehicle Parking Areas for Commercial or Industrial Uses
- Industrial and Commercial High Traffic Areas
- Land Uses Subject to Oregon Department of Environmental Quality 1200-Z Industrial Stormwater Permit Requirements

1.2.2 Exemptions

Projects in the following categories are generally exempt from the requirements of these standards:

A. **Stream enhancement or restoration projects** approved by the City

B. **Farming practices** as defined by Oregon Revised Statutes (ORS) 30.930 and **farm use** as defined in ORS 214.200, except that buildings associated with farm practices and farm use are subject to the requirements of these standards

C. Actions by a public utility or any other governmental agency **to remove or alleviate an emergency condition**

D. **Road and parking area preservation/maintenance projects** such as pothole and square cut patching, surface sealing, replacing or overlaying of existing asphalt or concrete pavement, provided the preservation/maintenance activity does not expand the existing area of impervious coverage above the thresholds listed in **Section 1.2.1**

E. **Pedestrian and bicycle improvements** (sidewalks, trails, pathways, and bicycle paths/lanes) where no other impervious surfaces are created or replaced, built to direct stormwater runoff to adjacent vegetated areas

F. **Underground utility projects** that replace the ground surface with in-kind material or materials with similar runoff characteristics

G. **Maintenance or repair** of existing utilities

H. An exemption to the flow control requirements (see **Section 4.2**) of these standards will be granted when **all** of the following apply:

- The development site discharges directly to the Willamette River, Clackamas River, or Abernethy Creek; and
- That development lies within the 100-year floodplain or is up to 10 feet above the design flood elevation as defined by OCMC 17.42; and
- The project site must be drained by a conveyance system that is comprised entirely of manmade elements (e.g., pipes, ditches, culverts, outfall protection, etc.) and extends to the ordinary high water line of the exempt receiving water; and
- The conveyance system between the project site and the exempt receiving water shall have sufficient hydraulic capacity and erosion stabilization measures to convey discharges from the proposed conditions of the project site and the existing conditions from non-project areas from which runoff is collected.

1.3 General Stormwater Management Principles

The City restricts the uncontrolled and untreated discharge of pollutants into any stormwater system and/or natural drainageway area. The City's stormwater standards are intended to provide guidance for the reduction of pollutants in stormwater to the Maximum Extent Practicable (MEP).

Stormwater pollutants are generally separated into the following categories: suspended solids (sediment), oxygen-demanding pollutants, bacteria, organic carbon, hydrocarbons, metals (lead, copper, zinc, mercury, and cadmium), nutrients (nitrogen and phosphorous) and pesticides/herbicides.

The most effective method for preserving stormwater quality is preventing pollution of stormwater runoff at the source. Constructed stormwater management facilities are the last line of defense for removing pollutants contained in stormwater runoff.

Stormwater management facilities use a variety of methods to remove pollutants from stormwater, such as infiltration, sedimentation, filtration, plant uptake, ion exchange, adsorption, and bacterial decomposition. Infiltration is the preferred method to address stormwater runoff for water quality and flow control requirements. In some cases, a combination of stormwater management facilities, referred to as a treatment train, may be the most effective strategy for removal of specific pollutants of concern in designated high-risk areas.

In selecting a stormwater management approach, the designer must consider site characteristics, anticipated land uses, runoff characteristics, and treatment objectives. Once the site analysis is complete, the designer may incorporate the most effective stormwater management facilities into the stormwater management plan for the proposed development. See **Chapter 2** for additional details on site assessment and planning and **Chapter 4** for design criteria, design methods, and facility selection and sizing.

1.4 Stormwater Management Requirements

The following requirements apply to all projects:

1.4.1 General Design Requirements

Design of stormwater management plans must include provisions to control runoff adequately from impervious and pervious areas within and upstream of the development without exceeding capacities of available facilities and downstream drainageways. General design considerations are as follows:

A. Surface or subsurface drainage, caused or affected by development, shall not flow over adjacent public or private property in a volume or location significantly different from that which existed prior to development, but shall be collected and conveyed to an acceptable point of discharge as approved by the City.

B. The City generally does not allow the diversion of stormwater from one drainage basin or watershed to another drainage basin or watershed.

C. Surface drainage entering a development from offsite areas shall be intercepted at the naturally occurring locations. Offsite surface drainage shall be conveyed through the site in a separate system and will not be mixed with the stormwater collected and treated in onsite stormwater management facilities unless the onsite stormwater management facilities are designed to manage the additional flows from the upstream drainage basin(s) assuming full development potential.

D. All public storm drainage systems shall be gravity systems without the use of pumps or other mechanical means to convey or transport stormwater.

E. The point of discharge for all stormwater may be a piped system, curb and gutter, or open channel as approved by the City. All outfalls to an existing or proposed stormwater facility, conveyance system, or drainageway shall be approved by the City.

F. When an approved point of discharge is located on an adjacent private property, the applicant shall be responsible to acquire all applicable downstream private and/or public stormwater easements.

G. In compliance with Oregon Drainage Law, development shall not adversely impact downstream properties. Stormwater runoff from a development shall be safely conveyed to prevent the uncontrolled or irresponsible discharge of stormwater onto adjoining public or private property.

H. The point of discharge for stormwater shall not be the City's sanitary sewerage system, except as provided in **Chapter 6**.

I. No project or development shall directly or indirectly discharge, to the public storm system, any quantity of stormwater, pollutant, substance, or wash water that will violate the discharger's permit (if one is issued), the City's NPDES MS4 permit, OCMC, or other environmental laws or regulations.

1.4.2 Stormwater Management Plan

All projects that meet the thresholds in **Section 1.2.1** shall prepare a Stormwater Management Plan that addresses the following elements. Each requirement is explained in further detail in the following chapters and sections.

- Site Assessment and Planning – **Section 2.2**
- Grading, Fill, and Excavation – **Section 3.1**
- Stormwater Management Facility Design – **Section 4.2**
- Stormwater Conveyance – **Section 5.1**
- Source Controls – **Section 6.1**
- Erosion Prevention and Sediment Control – **Section 7.1**
- Operation and Maintenance of Stormwater Facilities – **Section 8.1**

1.4.3 Stormwater Site Design Incentives

Incentive programs are continuously changing and evolving. While the City does not administer an incentive program for stormwater-related design elements, applicants may find that required stormwater facilities can be beneficial in qualifying for incentives or benefits from other agencies. Examples include the Leadership in Energy and Environmental Design program, the Envision Rating System administered by the Institute of Sustainable Infrastructure, Salmon-Safe, Earth Advantage, and the Sustainable Sites Initiative. Information on these programs should be discussed with representatives from the sponsoring agency.

1.4.4 Additional Requirements

The requirements presented in these standards do not exclude or replace the requirements of other applicable codes or regulations, such as the Willamette Basin Total Maximum Daily Load Program, the industrial NPDES permitting program, or any other applicable federal or state regulations or permit requirements.

All development within Federal Emergency Management Agency (FEMA)-regulated streams and floodplain overlay zones shall meet the FEMA floodplain permit approval process requirements and the requirements of OCMC 17.42 through the local planning and building authority.

If it is determined by the City that stormwater management or conveyance facilities, in addition to the onsite facilities required by these standards, are necessary to manage and protect natural resources, municipal infrastructure, and/or private property effectively, the City may require additional facilities or modifications.

1.4.5 Alternative Materials and Methods

Alternative materials and methods for stormwater management will be accepted only if the applicant can demonstrate that the existing standards are not appropriate for a given site and the proposed alternative provides the same or greater level of stormwater management as defined in these standards. Alternate materials or methods not explicitly approved herein will be considered for approval through the modification process outlined in **Section 1.6**. All requests will be evaluated on a case-by-case basis, and approval of alternative materials and methods for one development proposal will not imply an approval under similar circumstances in another proposal.

1.4.6 Stormwater Easements

Drainage easements shall be provided in a proposed development for all stormwater facilities that are not located in public ROWs or tracts. Said drainage easements shall be granted to the parties responsible for providing ongoing maintenance of the stormwater facilities.

City-maintained stormwater management facilities, including access roads to said facilities, shall require a public stormwater easement or dedication as described in **Chapter 5** and **Chapter 8**. The stormwater easement shall include access to all stormwater management facilities to accommodate maintenance of the facilities. The owner shall provide the City with all necessary documentation granting such easements. The City will not approve the final construction plans until all public and private easement documents have been completed to the satisfaction of the City.

1.4.7 Operations and Maintenance (O&M) Requirements and Access

Stormwater management facilities that serve a single property owner may be privately maintained. Stormwater management facilities that serve multiple properties (e.g. facilities for residential subdivisions) shall be transferred to public ownership following the 2-year maintenance warranty period. Regardless of ownership, all stormwater management facilities are required to comply with O&M requirements described in **Chapter 8**.

1.5 Jurisdictional Requirements

1.5.1 Jurisdiction

The City may promulgate new or amended policies pertaining to these standards in accordance with any other rules and regulations issued by the City and approved by the governing body.

1.5.2 Compliance with Laws

Conformance with these standards shall not be a substitute for, or eliminate the necessity of, conforming with any and all federal, state, and local laws, ordinances, rules and regulations which are now, or may in the future, be in effect.

1.5.3 Conflicts

Any provisions or limitations of these standards and any regulation and order adopted pursuant hereto are suspended and supplemented by any applicable federal, state, or local requirements existing or adopted subsequent hereto which are more stringent than the provisions and limitations contained herein, provided, always, that any provision of these standards and policies adopted pursuant thereto which are more stringent than any applicable federal, state, or local requirement shall prevail and shall be the standard for compliance by all properties within the city boundary.

1.6 Modification Process

Modification to the adopted stormwater standards may be requested in accordance with OCMC 17.62.050 using the following process.

1.6.1 Modification Request Submittal

Requests to modify the stormwater standards shall be submitted in writing to the City and include the following:

A. The desired modification(s).

B. The reason(s) for the request(s).

C. A comparison between the specification(s) and standard(s) and the modification(s) for performance, function, maintainability, safety, etc.

D. References to regional and/or national accepted standards, record of successful use by other agencies, or other supportive information.

E. It is the responsibility of the applicant to obtain all approvals from any federal, state, or local entity that has authority over or is responsible for permitting of the activities before proceeding with an approved modification.

1.6.2 Criteria for Modification of Standards

The City may grant a modification to the adopted standards when the use thereof does not compromise public safety, environmental protection, or the intent of the stormwater standards and any one of the following conditions are met:

A. The standard is deemed not applicable for the particular application.

B. Topography or other geographic conditions impose an environmental or safety concern and an equivalent alternative exists, which can accomplish the same design intent as provided in these standards.

C. A minor change to the standard is required to address a specific design or construction problem which, if not enacted, will result in an undue hardship.

D. The proposed modification is in the public interest and requirements for safety, function, appearance, and maintainability based on sound engineering and technical judgment are fully met.

E. The financial viability of meeting the requirements of these design standards is not in itself an adequate justification for granting a modification of the standards.

1.7 Design Professional

Much of the information covered in this document is addressed to professional engineers. In order to assist the professional engineer in fulfilling his/her responsibilities related to a development project, the following comments address the City's expectations regarding the responsibilities of the project engineer and other design professionals.

1.7.1 Project Engineer's Responsibilities

All engineering plans, reports, or documents must be stamped and signed by a professional civil engineer registered in the State of Oregon. The project engineer is responsible for reviewing any proposed improvements or modifications to the existing storm drain system with City staff prior to commencement of design work to determine any special requirements and whether the proposal is permissible.

When specifically indicated in this document, some submittals do not require the approval or stamp of a professional engineer. These include, but are not limited to the site assessment and planning checklist, the use of the BMP Sizing Tool to size stormwater facilities, and the design of planting plans.

The project engineer's responsibilities include:

A. The project engineer shall prepare construction plans for site development meeting City standards. The engineer shall remain responsible for the accuracy, completeness, and scope of all work submitted to the City. The project engineer shall be responsible for correcting all deficiencies, when necessary, should errors, omissions or inaccurate data due to the engineer's work come to the City's attention in the future. The project engineer shall be responsible for any damages resulting from the incorrect work.

B. The project engineer shall incorporate recommendations from geotechnical engineering reports and any other engineering recommendations into the construction plans for site development.

C. The project engineer shall, when required by the City, be responsible for the inspection and approval of the construction within the engineer's area of technical expertise. This responsibility shall include, but need not be limited to, construction observation and approval as to the establishment of line, grade, maintenance, and implementation of Best Management Practices (BMP) and drainage of the develop-

ment area. In conjunction with the execution of this responsibility, copies of any on-site inspection reports shall be submitted by the engineer to the City, when so requested. Inspection under this paragraph means the visual observation and documentation of the construction of the stormwater system and BMPs as compared to the approved plans, specifications, and City standards.

D. The project engineer shall act as the coordinating agent in the event the need arises for liaison between the owner, other professionals, contractors, the City, and other agencies.

E. The project engineer shall be responsible for the preparation of revised plans and the submittal of as-built plans or record drawings, as applicable upon completion of work.

F. The project engineer shall be responsible for verification of excavation and embankment quantities, detention pond volumes, slope steepness, and compliance with approved construction plans.

G. Approval of plans and issuance of permits by the City does not in any way relieve the project engineer of his/her responsibility to meet all requirements of the City or other affected jurisdictions, or the obligation to protect the life, health, and property of the public. The design for any project must be revised or supplemented at any time it is determined or suspected by the City or the engineer of record that the full requirements of the City were not met.

1.7.2 Geotechnical Engineer's Responsibilities

When a geotechnical investigation report is required, the minimum responsibilities of the geotechnical engineer shall be as follows:

A. The preparation of any required geotechnical investigation report.

B. All reports, field data, test data, and recommendations shall be submitted to the project engineer and to the City Engineer.

C. The geotechnical engineer shall provide, when required by the project engineer or the City Engineer, professional inspection and approval concerning the preparation of ground to receive fills and testing for required compaction. The geotechnical engineer shall also provide oversight on stability of all finished slopes and the design of embankment fills.

D. The geotechnical engineer shall prepare, when required by the project engineer or the City Engineer, a final soils report which includes locations and elevations of field density tests. The final soils report shall also include summaries of field and laboratory tests and other substantiating data and comments on any changes made during site development.

1.7.3 Landscape Architect's Responsibilities

When plans for a proposed stormwater management facility are prepared by a licensed landscape architect, the landscape architect shall prepare construction plans for site development meeting the standards and requirements of this document. The landscape architect shall be responsible for correcting all deficiencies, when necessary, should errors, omissions, or inaccurate data due to the landscape architect's work come to the City Engineer's attention in the future. The landscape architect shall be responsible for any damages resulting from the incorrect work.

CHAPTER 2

Site Assessment and Planning

CHAPTER 2. SITE ASSESSMENT AND PLANNING

The Stormwater and Grading Design Standards are intended to guide site-specific stormwater management improvements. Strategies for meeting the requirements in these standards depend on a number of site factors, including soil infiltration capacity, available infrastructure, and proposed development plans. To use these standards effectively, applicants must demonstrate an understanding of the development site conditions and the upstream and downstream impacts resulting from the proposed development and the required stormwater management improvements.

2.1 Introduction and Applicability

This chapter describes the process for preparing the Site Assessment and Planning submittal, the first step in meeting the City of Oregon City's (City) stormwater management requirements. The *Site Assessment and Planning Checklist* (**Appendix B**) should be completed and submitted to the City as part of the Land Use Application. Refer to **Submittals (Chapter 9)** for additional information. **The Site Assessment and Planning submittal is required for all development that creates 5,000 square feet (SF) or more of new and/or modification of existing impervious surface area.**

The purpose of the site assessment and planning requirements is to ensure that the physical attributes of the development site are reviewed before placing manmade structures such as streets, parking lots, and buildings. This is meant to optimize site design of stormwater management techniques and sensitive areas protection, and to reduce or eliminate potential conflicts between site development elements and required stormwater management systems. A layout that integrates site attributes to manage stormwater and protect habitat may reduce the number, size, and cost of stormwater facilities required for the site.

2.2 Site Assessment and Planning Submittal

The Site Assessment and Planning submittal will include the completed checklist from **Appendix B**, site assessment maps, preliminary site plan, preliminary facility sizing documentation, and supporting materials as described below.

2.2.1 Site Information

Provide the requested site information in the checklist, with reference to supporting documentation and maps as appropriate for the site. The following should be included:

- Applicant contact Information
- Project location, including whether the site is located within the Oregon City Municipal Code (OCMC) 17.49, Natural Resource Overlay District, US Geologic Hazard Overlay Zone as defined by OCMC 17.44, and/or the Flood Management Overlay District as defined by OCMC 17.42
- Project type
- Size of site and amount of proposed impervious area

2.2.2 Site Assessment

Applicants must inventory conditions on and adjacent to the site to learn how stormwater moves through the site and how natural hydrologic functions may be protected and preserved. The information must be presented on a Site Assessment Map at a standard engineer scale appropriate for analyzing the information.

The site assessment should follow the order depicted in **Figure 2-1**. The required information is detailed below.

A. Topography

Steep slopes greater than 25 percent and setback areas around those steep slopes, as well as landslide zones, are subject to additional requirements and restrictions under OCMC 17.44. Infiltration is not allowed on steep slopes and slide-prone areas. **Infiltrating stormwater on moderate slopes (10 percent or greater) requires a geologist or geotechnical engineering analysis to determine the appropriate strategies.**

B. Soils and Seasonal High Groundwater

Use soil maps, which are available from the Natural Resources Conservation Service Soil Survey to determine the site hydrologic soil type (an indication of soil infiltration capacity). An assessment of the seasonal high water table may be required to ensure the functionality of the system.

C. Infiltration Assessment

Stormwater management facility sizing is based on tested infiltration rates. See **Appendix D** for specific infiltration testing requirements and methods.

D. Hydrology – Site Conditions and Natural Features

Show natural and manmade drainage features including channels, pipes, and outfalls. Identify jurisdictional wetland(s) (per Oregon Department of State Lands and U.S. Army Corps of Engineers) or 100-year floodplain (per Federal Emergency Management Agency [FEMA] mapping) present on the site.

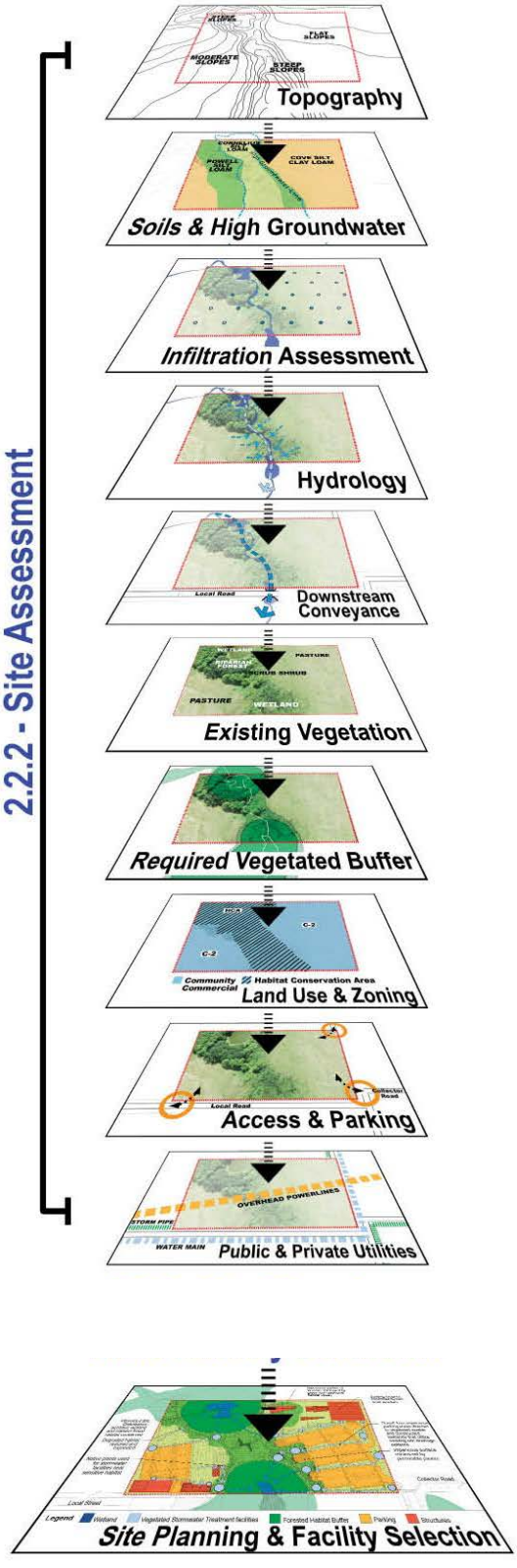


Figure 2-1.
Site Assessment Process

E. Downstream Conveyance

Document the existing and proposed points of discharge for stormwater runoff leaving the site. See **Chapter 5** for downstream analysis requirements and attach the required documentation to this submittal package.

F. Existing Vegetation

Using aerial photos or survey, map all trees and vegetation. Show all existing trees on the site assessment map and mark areas of other vegetation types (e.g., shrubs, pasture). Native trees and vegetation should be protected whenever possible.

G. Required Vegetated Buffers

Document required vegetated buffer areas (per OCMC Title 17). Show required buffer areas on the Site Assessment Map.

H. Land Use and Zoning

Document the existing zoning, including any special overlay zones and/or special districts.

I. Access and Parking

Map proposed access points for all modes of transportation.

J. Public and Private Utilities

Map existing public and private utilities on the site and surrounding areas, including storm, sewer, water, wells, dry wells, onsite septic system, electricity, phone/cable, and gas.

2.2.3 Site Planning Design Objectives

Prepare a Preliminary Site Plan at an engineer scale appropriate to review the information that includes proposed grading, clearing areas, stormwater facilities, natural resource areas and required setbacks, buildings, parking areas, streets and other proposed impervious areas. The Preliminary Site Plan must address the four objectives listed below to reduce the impact of stormwater runoff from development, which may reduce the size of stormwater facilities required.

1. *Preserve Existing Resources*

   Required actions: On the Preliminary Site Plan, show sensitive areas and required buffers and setbacks. Show areas that require enhancement. If encroachment into any vegetated buffer area is proposed, show the area of encroachment on the site map and show related proposed mitigation areas. Refer to OCMC Title 17 to identify any other buffer, conservation, or setback requirements.

2. *Minimize Site Disturbance*

   Required actions: Protecting undisturbed, uncompacted areas from construction activities provides more rainfall interception, evapotranspiration and runoff rate attenuation than clearing and replanting, even with soil amendments. On the Preliminary Site Plan, identify areas that will not be cleared during construction.

3. *Minimize Soil Compaction*

   Required actions: Avoid any construction activity that could cause soil compaction in areas designated for stormwater management facilities to preserve filtration and infiltration characteristics of the soil. Also avoid soil compaction in vegetated buffers, and mitigation and/or re-vegetation areas. Delineate these areas on the Preliminary Site Plan and protect during construction with orange construction fencing.

4. *Minimize Imperviousness*

   Required actions: Document the proposed impervious areas for the site. Consider the use of impervious area reduction strategies, such as porous pavement and/or green roofs, to reduce the net impervious area proposed for the site. Impervious area reduction strategies will reduce the impervious area requiring stormwater management facilities. Identify proposed impervious area reduction methods and show them on the Preliminary Site Plan.

2.2.4 Stormwater Management Strategy

Given suitable site and soil conditions, the City requires that the stormwater management strategy prioritize infiltration of stormwater runoff to the maximum extent practicable (MEP) to recharge groundwater and mimic pre-development hydrologic conditions. A geotechnical report is required to document onsite infiltration conditions in order to determine the appropriate stormwater management strategy.

Figure 2-2 shows the City's Stormwater Management Hierarchy that should be used in selecting the proposed stormwater management strategy. Applicants must demonstrate that the strategies higher on the hierarchy are not feasible before selecting a lower level strategy for stormwater management.

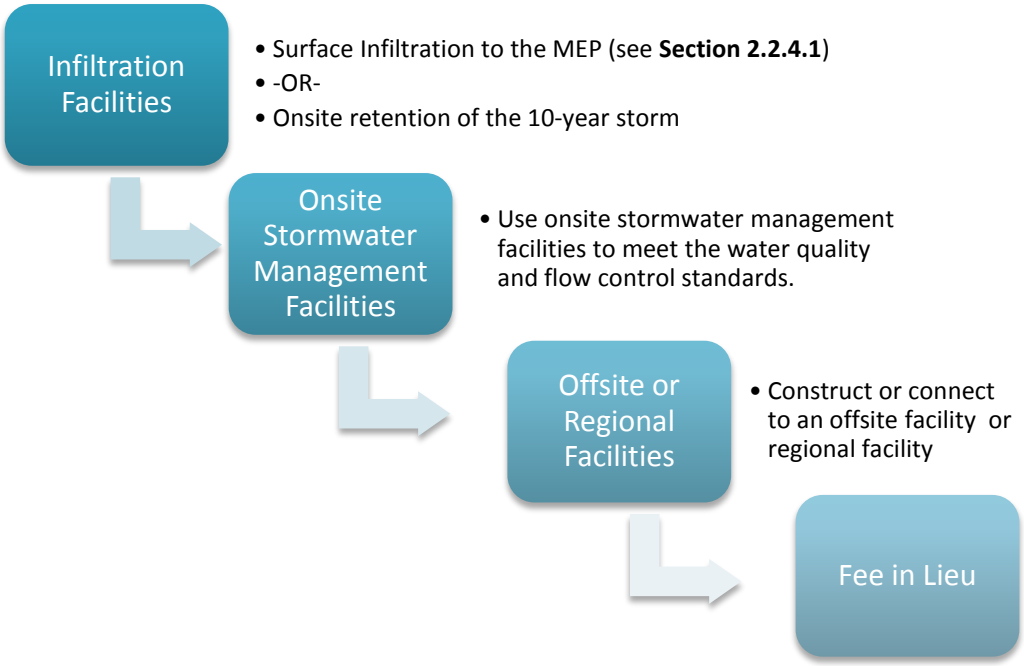


Figure 2-2. Stormwater Management Strategy Heirarchy

After selecting a stormwater management strategy, applicants should indicate which stormwater management facilities are proposed for the site based on the results of the site assessment and planning process. The BMP Sizing Tool should be used to determine preliminary sizes for stormwater management facilities and the BMP Sizing Tool report should be included as part of the application. All proposed stormwater management facilities should be shown on the Preliminary Site Plan.

2.2.4.1 Infiltration to the MEP

The applicant must identify and select the strategy that will be used to infiltrate to the MEP and manage stormwater runoff to meet the water quality and flow control standards in **Chapter 4**. Two options exist under the infiltration strategy:

- **Surface infiltration facilities to the MEP** – Check this option if vegetated, surface facilities will be utilized to the MEP to address the water quality and flow control standards. Facilities must be sized according to the design requirements in **Chapter 4**, using either the BMP Sizing Tool or the Engineered Method. When site constraints restrict the area available for stormwater management facilities, an infiltration facility with a surface area equivalent to 10 percent of the total new plus replaced impervious area of the site will be considered the MEP. Approved stormwater management facilities are defined in **Chapter 4**.

  -OR-

- **Onsite retention of the 10-year design storm** – Check this option if infiltration facilities will be used to retain and infiltrate all stormwater runoff onsite up to and including the 10-year storm. Infiltration of the full 10-year design storm is assumed to satisfy both water quality and flow control requirements of **Chapter 4**.

2.2.4.2 Onsite Stormwater Management

When limiting conditions restrict the use of surface infiltration, the stormwater management strategy shall use onsite filtration or lined stormwater management facilities to meet the water quality and flow control standards in **Chapter 4**. Facilities must be sized according to the design requirements in **Chapter 4**, utilizing either the BMP Sizing Tool or the Engineered Method.

A geotechnical report is not required to document limiting conditions, but approval from the City is required to install lined and/or underground facilities in place of low-impact development facilities.

Limiting conditions may include the following:

A. Stormwater management facilities would be located on fill.

B. Site areas include steep slopes (>25 percent) and/or geologic hazard zone designations (per OCMC 17.44). A geotechnical engineering or geologist report and City approval is required for infiltration facilities on moderate slopes of 10 to 25 percent.

C. Sites in areas of seasonal high groundwater table. For site planning submittal, sites with jurisdictional wetlands or FEMA floodplains may be required to perform a seasonal high groundwater table assessment and determine that the seasonal groundwater table is at least 12 inches below the proposed bottom elevation of stormwater infiltration facilities.

D. Sites with contaminated soils. Sites that have contaminated soils must be evaluated by the Oregon Department of Environmental Quality and/or the U.S. Environmental Protection Agency to determine if areas on the property are suitable for infiltration without the risk of mobilizing contaminants in the soil or groundwater. Documentation showing contamination assessment and determination must be submitted to the City at the time of application.

E. There is a conflict with required source controls for high-risk sites.

The financial viability of constructing onsite infiltration facilities is not sufficient justification to move to a stormwater management strategy lower on the hierarchy. The applicant must demonstrate that the proposed development site has one or more of the physical limitations listed in this section.

2.2.4.3 Offsite or Regional Facilities

When limiting conditions restrict the use of onsite stormwater management facilities, the applicant may construct an offsite stormwater management facility or utilize offsite regional facilities to provide water quality treatment and flow control. When an offsite facility is proposed, design and construction of the facility shall meet these standards. The applicant shall obtain all permits and agreements with facility property owners to utilize an existing facility prior to project approval. Fees may be charged for the use of existing or future City-owned regional facilities. In such case, the fees shall be proportional to the City's cost to acquire property, design, construct, and maintain the regional facility.

2.2.4.4 Fee in Lieu

When a proposed development is unable to meet the flow control or water quality requirements of these standards through the above strategies, the City may allow applicants to pay a fee in lieu of stormwater management improvements. In such a case, the fee shall be based on the proportional cost for the City to construct an equivalent stormwater management facility, including costs for land acquisition, design, construction, maintenance, and administration.

The financial viability of designing and constructing onsite or offsite stormwater management facilities is not sufficient justification to utilize the fee in lieu program. Applicants must demonstrate that the proposed development site has one or more of the physical limitations listed in this **Section 2.2.4.2** and that offsite or regional facilities are not a feasible alternative.

2.2.5 Other Project Requirements

Use the Site Assessment and Planning Checklist (**Appendix B**) to document the following:

A. Grading permit requirements per OCMC 15.48 and associated grading plans required (see **Chapter 3**).

B. Source control requirements for proposed developments that are categorized as high risk for increased pollutant loading (see **Chapter 6**).

C. Erosion and sediment control requirements for sites that result in 1,000 square feet or more new or replaced impervious area or sites that disturb more than 1 acre (see **Chapter 7**).

D. Other natural resources-related permits that may be required as part of the proposed development activity. It is the responsibility of the applicant to identify and obtain required permits prior to project approval.

CHAPTER 3

Grading, Fill, and Excavation

CHAPTER 3. GRADING, FILL, AND EXCAVATION

The following grading, fill, and excavation standards are intended as MINIMUM requirements for grading activities in Oregon City. If circumstances create a hazard to life, endanger or adversely affect the use or stability of a public way, adjacent property, critical area, or drainage course, the City of Oregon City (City) may impose additional or more stringent requirements.

3.1 Geotechnical Engineering Report

A Geotechnical Engineering Report, when required, shall include, at a minimum, the following:

A. Data regarding the nature, distribution, and strength of existing soils.

B. Conclusions and recommendations for grading procedures and/or erosion control measures.

C. Design criteria for corrective measures when necessary.

D. Opinions and recommendations covering a site's adequacy for further development, such as cut and fill slopes, existing slope, soil types, settlement, expansive soils, applicable and seismic conditions.

E. Allowable bearing pressure, if applicable. Recommendations in the report shall be incorporated in the proposed plans or specifications.

F. A statement as to whether the proposed work involves soils which may be excessively erodible or which may have limited compaction capability, due to the moisture content or the potential unsuitable nature of the material itself.

3.2 Unstable or Steep Slopes

Any grading activity within the Geologic Hazards Overlay Zone shall comply with the City's engineering policies and OCMC 17.44.

3.3 Natural Resources Overlay District

Any grading activity within the Natural Resources Overlay District shall comply with the OCMC 17.49.

3.4 Excavations

Unless otherwise recommended in an approved geotechnical engineering investigation report, all excavated slope faces shall be no steeper than is safe for the intended use and shall not be steeper than two-horizontal to one-vertical (2h:1v). Steeper slopes shall be allowed if supported by geotechnical analysis by a Professional Engineer and approved by the City.

3.5 Fill and Embankments

Unless otherwise recommended in an approved Geotechnical Engineering Report, all fills and embankments must comply with the following minimum requirements listed in the section.

3.5.1 Preparation of Ground

A. Fill slopes shall not be constructed on natural slopes steeper than two-horizontal to one-vertical (2h:1v). The ground surface shall be prepared to receive fill by removing vegetation, non-complying fill, topsoil, and other unsuitable materials. The ground surface shall be scarified to provide a bond with the new fill.

B. The ground surface also shall be benched where natural slopes are steeper than four-horizontal to one-vertical (4h:1v) and the height is greater than 5 feet. This benching shall be into sound bedrock, glacial till, or other competent material as determined by a Geotechnical Engineer. The bench under the toe of fill on a slope steeper than 4h:1v shall be at least 10 feet wide. The area beyond the toe of fill shall be sloped for sheet overflow or a paved drain shall be provided. Refer to the Oregon Department of Transportation Standard Embankment Construction Detail (DET2100) for guidance.

C. When fill steeper than 4h:1v and higher than 5 feet is to be placed over an excavation, the Geotechnical Engineer shall certify that the foundation is suitable for the fill.

3.5.2 Fill Material

Organic material shall not be permitted in fills. No rock or similar irreducible material with a maximum dimension greater than 6 inches shall be buried or placed in fills.

EXCEPTION: The City Engineer may permit placement of larger rock or similar irreducible material (i.e., concrete, etc.) when a Geotechnical Engineer properly devises a method of placement and continuously inspects its placement and approves the fill stability. The following conditions shall also apply:

A. Before issuance of a Fill Permit, potential areas for rock disposal shall be delineated on the grading plan.

B. Rock sizes greater than 6 inches in maximum dimension shall be 5 feet or more below grade, measured vertically.

C. Rocks shall be placed to ensure filling of all voids with well-graded soil.

3.5.3 Compaction

All fills and embankments shall be compacted and tested in accordance with **City standards and the Oregon Structural Code (OSC), unless otherwise recommended in an approved Geotechnical Engineering Report**. Fills on sites of proposed structures shall be compacted as directed by the City Building Official in accordance with the OSC, **unless otherwise recommended in an approved Geotechnical Engineering Report**.

Testing of compaction shall be at the applicant's expense and shall be conducted by an independent and approved soil testing laboratory. Test frequency shall be per the City's standards, Project Engineer's direction, and/or at a frequency recommended in the Ge-

otechnical Engineering Report. At a minimum, testing shall start at the commencement of fill activities and one test shall be taken for every 500 cubic yards placed. In addition, where the City Engineer requires testing of the compaction of soils outside public right-of-way, compaction shall be tested by an independent soil testing laboratory at the owner's expense.

Minimum compaction values shall comply with City standards and OSC, unless otherwise recommended in an approved Geotechnical Engineering Report. Where a site-specific Geotechnical Engineering Report is approved, the recommendations in the report and values found shall supersede the City's standards as applicable.

Compaction of native soils is prohibited in areas proposed for stormwater management facilities and porous pavements, as compaction can significantly reduce the infiltration capacity of the soil. Refer to the site-specific engineering specifications for additional information.

3.5.4 Slope

The slope of fill surfaces shall be no steeper than is safe for the intended use and shall be no steeper than 2h:1v.

3.5.5 Structures

Fills that are intended to support structures shall be constructed in conformance with the requirements of the latest edition of the OSC, as adopted by the City. An assignment of allowable soil-bearing pressures will be under the jurisdiction of the City Building Official in accordance with the OSC. If a fill is proposed over an area that the City deems to be a potential building site and the applicant does not state an intent to construct buildings on the fill area at that time, then the City may, at its own discretion, require that a notice be recorded as a public record containing provisions which will include the nature and extent of the grading which has occurred on the parcel.

3.5.6 Stormwater Management Facility Berm Embankments

The following guidelines below shall be considered (or addressed as applicable) in the Geotechnical Engineering Report:

A. Berm embankments shall be constructed on suitable native consolidated soil (or adequately compacted and stable fill soils), which is free of loose surface soil materials, roots, and other organic debris. The embankment soils shall have the following minimum/maximum soil characteristics per the U.S. Department of Agriculture's Textural Triangle: a minimum of 30 percent clay, a maximum of 60 percent sand, a maximum of 60 percent silt, with nominal gravel and cobble content.

B. The berm embankment shall be constructed of compacted soil, (95 percent maximum dry density, per American Society of Testing and Materials (ASTM) D1557) placed in 6- to 8-inch lifts with hand-held equipment and 10-to 12-inch lifts with heavy equipment.

C. Berm embankments shall be constructed by excavating a key equal to 50 percent of the berm embankment's cross-sectional height and width measured through the center of the berm, except in bedrock where the key minimum depth can be reduced to 1 foot of excavation into the till.

D. Anti-seepage collars (and/or pipe anchor wall per City Standards) shall be placed on outflow pipes in berm embankments that impound water greater than 6 feet in depth.

E. Berm embankments 6 feet or less in height, including freeboard and as measured through the center of the berm, shall have a minimum top width of 5 feet. Berm embankments greater than 6 feet in height, as measured through the center of the berm shall be designed by the Geotechnical Engineer.

F. Where maintenance access is provided along the top of berm, the minimum width of the top of berm shall be 12 feet.

3.5.7 Growing Media for Stormwater Management Facilities

All public and private stormwater management facilities shall incorporate growing media as described in **Appendix A**. Growing media shall be installed according to the standards in **Appendix A**.

3.6 Setbacks

Excavation and fill slopes shall be set back from site boundaries in accordance with this section. Setback dimensions shall be horizontal distances measured perpendicular to the site boundary.

3.6.1 Top of Cut Slopes

The top of cut slopes shall not be made nearer to a site boundary line than one-fifth of the vertical height of cut with a minimum of 2 feet and a maximum of 10 feet. The setback may need to be increased for any required interceptor drains.

3.6.2 Toe of Fill Slopes

The toe of fill slopes shall not be nearer to the site boundary line than one-half the height of the slope with a minimum distance of 3 feet and a maximum of 20 feet. Where a fill slope is to be located near the site boundary and the adjacent offsite property is developed, special precautions shall be incorporated in the work as the City Engineer deems necessary to protect the adjoining property from damage as a result of such grading. These precautions may include, but are not limited to, the following:

A. Additional setbacks

B. Provision for retaining walls

C. Mechanical or chemical treatment of the fill slope surface to minimize erosion

D. Provisions for the control of surface waters

CHAPTER 4

Stormwater Management Facility Selection and Design

CHAPTER 4. STORMWATER MANAGEMENT FACILITY SELECTION AND DESIGN

This section of the Stormwater and Grading Design Standards describes the methods and criteria for selecting and designing stormwater management facilities for projects that exceed the development thresholds described in **Chapter 2**. Additional structural source controls may be required for certain types of development categorized as high risk for pollutants as described in **Chapter 6**.

4.1 Stormwater Management Facility Selection

Impervious area reduction techniques, such as retaining vegetation and open space, clustering buildings, disconnecting residential downspouts, and constructing pervious pavement and green roofs, may be used as techniques to help mitigate stormwater runoff and reduce the size of the required stormwater management facilities. Impervious area reduction techniques should be identified during the site planning process (See **Chapter 2** and **Appendix B)**.

Low-impact development (LID) facilities such as planters, swales, rain gardens, ponds, and other vegetated facilities are best management practices (BMPs) and are the preferred strategy to meet the stormwater management requirements for water quality treatment and flow control. The following types of stormwater management facilities can be used to meet these standards.

- Stormwater planters (infiltrating and filtrating)
- Rain gardens (infiltrating and filtrating)
- Vegetated swales
- Detention ponds
- Infiltration trench
- Manufactured treatment technologies (See **Appendix E** for a list of approved devices)

Applicants shall follow the Stormwater Management Hierarchy in **Section 2.2.4** in selecting the appropriate approach to manage stormwater runoff. **Table 4-1** provides a quick reference to match stormwater management facility types with common design objectives and site constraints.

4.1.1 Alternate Facilities

Applicants may propose stormwater management facilities that are not listed in **Table 4-1**. Such a proposal will require the applicant to submit a request for a modification to these standards per **Section 1.6**. Alternate facilities must be sized using the Engineered Method as described in **Section 4.3.2**. Examples of alternate facilities include filter strips for water quality treatment, underground detention storage, dry wells, or other underground injection control (UIC) facilities on private property.

If a proposed facility meets the Oregon Department of Environmental Quality (ODEQ) criteria for a UIC, the applicant shall prepare appropriate registration information for ODEQ and submit a modification request to the City.

Table 4-1. Stormwater BMP Selection Guidance for Site Conditions

Facility can be used for	Porous pavement	Green roof	Stormwater planter	Rain garden	Vegetated swale	Detention pond	Infiltration trench	Manufactured treatment technologies
Impervious area reduction	●	●						
Infiltration facility[a]			●	●	●	●	●	
Flow control	●	●	●	●	●	●	●	
Water quality treatment	●	●	●	●	●	●	●	●
Private property	●	●	●	●	●	●	●	●
Public property or right-of-way		●	●	●	●	●		●
Steep slopes		●	w/liner					●

[a] *Facilities that include impermeable liners do not satisfy the requirements for surface infiltration.*

4.2 Design Criteria for Stormwater Management Facilities

Stormwater management facility design is based on meeting the City's design criteria to address LID requirements, water quality treatment standards, and flow control requirements.

LID Requirement: The goal is to prioritize the use of surface infiltration facilities to the maximum extent practicable (MEP) to mimic the natural stormwater runoff conditions of the pre-developed site and recharge the groundwater. As described in **Chapter 2**, either one of the following two options may be used to meet the LID requirement:

- **Surface infiltration to the MEP** – Utilize surface infiltration facilities to the MEP to address the water quality and flow control requirements of the site. Facilities must be sized according to the design requirements of this chapter, utilizing either the BMP Sizing Tool, explained in **Section 4.3.1**, or the Engineered Method. When site constraints limit the surface area available for stormwater management facilities, an infiltration facility with a surface area equivalent to 10 percent of the total new plus replaced impervious area of the site will be considered the MEP.

  -OR-

- **Onsite Retention** – Retain and fully infiltrate the 10-year design storm onsite using surface infiltration facilities. This is equivalent to retaining and infiltrating runoff from new and replaced impervious surfaces for the 3.4-inch storm over 24 hours. The facility must fully infiltrate within 72 hours following the beginning of the storm event. Infiltration of the full 10-year design storm is assumed to satisfy both water quality and flow control requirements listed in the following paragraphs.

For sites with conditions that limit the use of infiltration (fill, steep slopes, high groundwater table, wellhead protection areas, and/or contaminated soils), the applicant must submit documentation of limiting conditions. In such cases, utilizing LID facilities may not be practicable and the City may approve the use of lined, non-infiltrating or underground stormwater management facilities to meet the water quality and flow control requirements listed below. See **Section 2.2.4.2** for additional information regarding limiting conditions.

Water Quality Requirement: Water quality facilities shall be designed to capture and treat 80 percent of the average annual runoff volume to the MEP with the goal of 70 percent total suspended solids removal. The treatment volume equates to a **water quality design storm of 1.0 inch over 24 hours**[1]. The BMP Sizing Tool addresses these water quality requirements to size stormwater management facilities.

Hydrodynamic separators, when used as a sole method of stormwater treatment, do not meet the MEP requirement for water quality treatment with regard to these stormwater standards.

Flow Control Requirement: Flow control facilities shall be designed so that the **duration of peak flow rates from post-development conditions shall be less than or equal to the duration of peak flow rates from pre-development conditions for all peak flows between 42 percent of the 2-year peak flow rate**[2] **up to the 10-year peak flow rate**. A hydrologic/hydraulic analytical model capable of performing a continuous simulation of peak flow rates from local long-term rainfall data must be used to determine the peak flow rates, recurrence intervals, and durations. The BMP Sizing Tool addresses these flow control requirements to size stormwater management facilities.

General Conveyance: Development shall not cause or increase flooding of adjacent or downstream property. An upstream and downstream analysis of the drainage system shall be conducted according to the guidelines in **Chapter 5**. Open channel and closed conduit systems shall be designed to convey the design storms listed in **Table 5-1**.

4.3 Design Methods

This section explains the two methods accepted by the City for designing stormwater management facilities, the BMP Sizing Tool Method and the Engineered Method. To use a different method for sizing a treatment facility type not covered in these standards, applicants must obtain City approval prior to submitting permit applications for review.

Submittal requirements for both methods are included in **Chapter 9**.

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[1] The water quality design storm rainfall depth as documented in a technical memorandum: *Selection of Representative Rainfall Volume and Rainfall Intensities to result in Capture and Treatment of 80% of the Average Annual Runoff Volume*, Brown and Caldwell, May 11, 2010.

[2] The lower threshold of 42 percent of the 2-year peak flow rate for flow-duration matching is based on a 2008 study by the Oregon Department of Transportation (ODOT) titled, "Water Quantity (Flow Control) Design Storm Performance Standard." ODOT's study found that bed movement in sand-bedded streams occurs at approximately two-thirds of the bank full flow, which is assumed to be roughly equivalent to the 1.2 year discharge. ODOT's flow frequency analysis established that two thirds of the 1.2-year discharge is approximately equivalent to 42 percent of the 2-year discharge.

4.3.1 BMP Sizing Tool Method

A BMP Sizing Tool is available from the City's website to assist with the sizing of stormwater management facilities that meet the requirements of these standards. The following facilities can be sized using the tool:

- Rain garden – infiltration and filtration
- Stormwater planter – infiltration and filtration
- Vegetated swale – infiltration and filtration
- Infiltrator
- Detention pond

The detention pond option will allow credit for the utilization of upstream LID facilities, including rain gardens, planters, infiltrators, and swales.

The report generated by the BMP Sizing Tool should be included with permit application submittals. The BMP Sizing Tool can be used during the initial site planning and during final design. The soil infiltration rates used during final design must meet the criteria outlined in these standards.

4.3.2 Pre-developed Hydrology

For the purposes of hydrologic modeling, the pre-developed conditions of the site will be modeled as the historical vegetation which existed at the site prior to urban settlement. Most areas of the City will be modeled as forest under pre-developed conditions. Areas of the City where the pre-developed vegetation included oak savannah should be modeled in the sizing tool as grass. Areas of the City that were cultivated for agriculture prior to urban development also may be modeled as grass under the pre-developed condition requirements. The applicant may use historic photos, reports, or other available sources to document the condition of the site prior to urban settlement.

In the absence of site specific resources, the City has developed a map of historic vegetation conditions that can be used in determining the appropriate pre-developed conditions land cover (See **Appendix G**). This map is also available for viewing within the City's GIS Public Portal.

4.3.3 Facility Design Adjustments

The BMP Sizing Tool was developed based on specific design requirements for each facility type. Facilities sized using the tool must follow the design details for ponding depth, overflow height, depth of growing media, depth of drain rock, and sizing of orifice controls (where relevant). Applicants who wish to propose alternate facility specifications may use **Table 4-2** to adjust the size of the stormwater facility calculated from the BMP Sizing Tool.

Applicants considering design adjustments different from those included in **Table 4-2** should utilize the Engineered Method to show how the proposed facility size and design specifications will meet the flow control and water quality requirements of these standards.

Table 4-2. Facility Sizing Adjustments*

Facility types	Design modification	Facility size adjustment
Stormwater planter Rain garden Vegetated swale	Increase growing media depth by 12 inches or more	Reduce required facility surface area by 20 percent

**Additional facility size adjustments may be developed at the discretion of the City Engineer. Refer to the City's engineering policies for additional facility sizing adjustments.*

4.3.4 Engineered Method

As an alternative to the BMP Sizing Tool, the Engineered Method may be used to calculate the required size of stormwater management facilities for any size or type of development. The Engineered Method provides the developer with flexibility to factor in a wider variety of site data and facility design parameters to determine the size and configuration of stormwater management facilities.

The Engineered Method may be used to do the following:

- Address unique site conditions
- Apply a new or emerging design technology
- Propose alternate facility design specifications

Use of the Engineered Method for flow control requires the development of a hydrologic/hydraulic analytical model capable of performing a continuous simulation of peak flows from long-term local rainfall records. The City must pre-approve the hydrologic/hydraulic analytical model prior to submittal or development of any plans and/or calculations. Regardless of how the stormwater calculations are performed, the report submitted to the City must show how the proposed stormwater management facilities meet the design criteria for LID, water quality, and flow control provided in **Section 4.2**.

Creation of a continuous simulation hydrologic model for a specific development site requires specialized expertise and usually takes additional time and expense to develop and review. The applicant will be required to pay additional fees to the City to review stormwater management plans developed using the Engineered Method. These fees will be used to pay for a third-party peer review of the hydrologic model, stormwater management plan, facilities, details, supporting documentation and submittals.

The Engineered Method can also be used to document the use of the hydrograph method to size water quality and infiltration facilities when flow control is not required. See **Appendix H** for additional hydrograph method guidance.

4.4 Unmitigated Areas

Due to topographic constraints, runoff from portions of a development site may be permitted to be released at post-development rates (without flow control), provided that all of the following are met:

A. Runoff from the unmitigated area rejoins the pre-development downstream drainage course within one quarter mile downstream of the stormwater management facility.

B. The project engineer has demonstrated in the downstream analysis (see **Section 5.2.4**) and in conveyance capacity calculations (see **Chapter 5**) that the downstream drainage course will not be adversely impacted by the runoff from the unmitigated area. Improvements to the downstream conveyance system may be required to provide adequate conveyance capacity for flows from unmitigated areas.

C. Public easements (as required) are obtained by the applicant from all downstream property owners, through whose property the unmitigated runoff flows, prior to rejoining the detained runoff from the site.

D. The cumulative release rate from all areas of the project site, including the unmitigated area, shall not exceed the cumulative pre-developed rates from the site (in accordance with the flow control requirements in **Section 4.2**). This may be achieved by providing additional storage and flow control in the stormwater management facility to compensate for unmitigated areas.

4.5 Infiltration Rate and Testing

To size stormwater management facilities, it is necessary to know the infiltration rate of the soil at the actual facility location. Infiltration testing is not required on development projects which create less than 5,000 square feet of new or replaced impervious surface. When testing is not completed, the facility will be sized using the minimum infiltration rate as shown in the Natural Resources Conservation Service's soil classification. The City has approved two methods for performing an infiltration test, Basic Test and Professional Test. Specifications for both test procedures are included in **Appendix D**.

4.6 UIC Registration

Subsurface discharging infiltration facilities that are defined by ODEQ as UICs (e.g., infiltration trenches or dry wells) require an approved modification request (see **Section 1.6**). Any UIC for private property shall be designed with an approved pretreatment device and registered with ODEQ as required. The City will not allow new UIC devices which accept stormwater runoff from a public ROW or for public ownership or maintenance.

4.7 Detention Pond Design Requirements

The City encourages the use of detention ponds that serve more than one development. A facility that serves more than one development will be referred to as a sub-regional facility. Sub-regional facilities can be more effective in maximizing the development area, reducing the overall maintenance requirement, and minimizing the overall construction cost while enhancing water quality of the stormwater runoff.

The City also encourages applicants to design detention ponds to function as multipurpose facilities (i.e. parks, open space, or recreation facilities), provided that any alternative uses are compatible with the primary stormwater functions and maintenance standards.

The following design requirements apply to all detention pond designs:

4.7.1 Geotechnical Report

Detention ponds shall have a geotechnical report that discusses the site's suitability for the type of stormwater pond being proposed and/or the engineer's recommendations as to how the site shall be improved to make the site suitable for the type of stormwater pond being proposed.

4.7.2 Pond Depth

The maximum active storage depth is 4 feet. An exception from this criterion may be approved on a case-by-case basis if additional safety factors can be shown to address this issue.

When using the BMP Sizing Tool, the total depth measurement reported in the tool includes the active storage depth as well as the depth of growing media, separation layer, and drain rock, as shown in **Figure C-11** in **Appendix C**.

4.7.3 Bottom Width

For ponds with an active storage depth of 3 feet or less, the minimum bottom width shall be 10 feet. For ponds with an active storage depth of over 3 feet, the minimum bottom width shall be 15 feet. An exception from this criterion may be approved on a case-by-case basis if required by topographical or physical boundary constraints. For the purposes of this bottom width measurement, the width shall be measured at the interior toe of slope.

4.7.4 Interior Side Slopes

Interior side slopes shall be no steeper than three horizontal to one vertical (3h:1v). An exception from this criterion may be approved on a case-by-case basis if required by topographical or physical boundary constraints.

4.7.5 Exterior Side Slopes

Exterior side slopes that have vegetated surfaces that require mowing shall be no steeper than four horizontal to one vertical (4h:1v). Exterior side slopes that have vegetated surfaces that do not require mowing shall be no steeper than two horizontal to one vertical (2h:1v). Exterior slopes shall be landscaped so that there is no exposed soil.

Berm embankments shall meet requirements of **Section 3.5.6.**

4.7.6 Conveyance Outfalls

Pipe outfalls from the conveyance system into the pond shall be flush with interior side slopes. Conveyance outfalls shall be designed with energy dissipation, in accordance with **Section 5.8**.

4.7.7 Outlet Structures

Primary Outlet. Detention ponds shall have a perforated pipe underdrain system to convey water from the pond to the flow control structure. See **Figure C-11** in **Appendix C** for a graphical depiction showing the underdrain system as the primary outlet.

Secondary Outlet. Detention ponds shall have a secondary pond outlet structure, such as a catch basin with grated lid located along an interior side slope. This secondary pond outlet will serve as a backup to convey stormwater to the flow control manhole should the primary pond outlet become clogged. The lip elevation of the secondary pond outlet should be set at approximately the ten-year design water surface. See **Figures C-11** and **C-12** in **Appendix C** for a graphical depiction showing a secondary pond outlet.

Flow Control Structure. Detention ponds shall have a flow control structure with orifice and weir dimensions sized using the BMP Sizing Tool or the Engineered Method. See **Figure C-12** in **Appendix C** for a graphical depiction showing a typical flow control structure. The flow control structure shall be designed to meet the following criteria:

A. Detention pond control structures may be either weir or orifice structures located in an enclosed manhole and meet City's standards. Locate the outlet control structure(s) outside the open water storage area.

B. The control structure shall be designed with an internal overflow device, such as an open top riser, to pass the 25-year design storm event (or 100-year design storm for a sub-regional facility) without allowing runoff to discharge through the emergency spillway and without causing upstream or downstream flooding. The design of the internal overflow shall assume that flow control orifices are plugged during the peak design storm.

C. Flow control manholes shall have solid locking covers. Open grates shall not be permitted in flow control manholes.

D. Locate the flow control structure to allow maintenance access as described in **Section 4.9.1**. The outlet flow control structure shall require little to no attention for normal operation.

E. The construction drawings shall include a separate design detail for each flow control structure.

4.7.8 Emergency Overflow

All ponds shall have an emergency overflow system that will safely pass runoff from a post-developed 100-year design storm through or around the detention pond and direct flows to the downstream conveyance system. The design intent of the emergency overflow system is to protect the integrity of the pond, as well as associated embankments and downstream properties, during large (rare) storm events and/or failure of the flow control structure. Secondary spillway shall meet the following criteria:

A. Locate the spillway to direct overflows safely toward the downstream conveyance system.

B. Locate the spillway in existing soil wherever possible. Protect the spillway with riprap or an approved material that extends to, is and an appropriate distance beyond, the bottom of the berm embankment. Fill the voids of the riprap with soil and vegetate the spillway with grass or ground cover. The selection of the vegetation on the spillway shall consider the required design capacity.

C. The invert elevation of the spillway shall be a minimum of 6 inches above the primary overflow elevation.

D. The minimum spillway depth shall be nine inches from the top of the berm. The free board during the design storm event shall be a minimum of 6 inches.

E. Alternate methods to accomplish the design intent of the secondary overflow system will be acceptable as long as they accomplish the same level of protection and are approved by the City Engineer.

4.7.9 Signage

All ponds shall have signs placed so that at least one is clearly visible and legible from all adjacent streets, sidewalks, or paths. Applicants may add an indigenous, native wild bird(s) or wild animal(s) logo or cartoon figure on the sign. Sign spacing shall be approved by the City Engineer. The sign shall read:

- Please Do Not Disturb the Vegetation or Wildlife
- Oregon City Stormwater Management Facility
- For More Information, Call Oregon City Public Works at 503-657-8241

The minimum sign size shall be 12-inches x 18-inches. The maximum sign size shall be 24-inches by 30-inches. The material shall be aluminum with green reflective sheeting and silk screen lettering or equal as approved by the City Engineer. The signs shall be installed on an 8-foot long by 6-inch by 4-inch treated lumber post which is set in concrete and buried 30 inches into the ground. The developer shall install these signs before the City's final acceptance of the pond.

4.7.10 Site Constraints

All publicly owned detention ponds shall be located in a separate tract dedicated to Oregon City for stormwater facilities. Open ponds shall not be located in dedicated public road right-of-way areas.

4.8 Planting, Irrigation, and Fencing Requirements

Landscaping guidelines for stormwater management facilities are included in the following sections.

4.8.1 Soil Mixes for Stormwater Management Facilities

Vegetated facilities require a soil/landscape system that simultaneously supports plant growth, soil microbes, water infiltration, nutrient and pollutant adsorption, sediment and pollutant filtration, and pollutant decomposition. Therefore, the soil mix selected for a facility is critical to its success. See the specific facility design criteria in **Appendix C**, and also refer to **Appendix A** for growing media specifications for vegetated facilities.

4.8.2 Planting

Stormwater management facilities with vegetative plantings must meet the following requirements:

A. Establishment procedures, such as control of invasive weeds, animal and vandal damage, mulching, re-staking, watering, and mesh or tube protection replacement, shall be implemented to the extent needed (as determined by the City) to ensure plant survival.

B. Stormwater facilities located in the public street ROW are not permitted to use evergreen trees to meet planting requirements.

C. Selected plant materials should be appropriate for soil, hydrologic, and other facility and site conditions (See **Appendix A**).

D. All plants within stormwater management facility areas shall be appropriate native species from the **Appendix A** Plant List (no nuisance, invasive, or prohibited plants).

E. The design for plantings shall minimize the need for herbicides, fertilizers, pesticides, or soil amendments at any time before, during, and after construction and on a long-term basis.

F. Plants shall be selected and planted to minimize the need for mowing, pruning, and irrigation.

G. Certified weed-free native grass or native wildflower seed shall be applied at the rates specified by the suppliers. If plant establishment cannot be achieved with seeding by the time of substantial completion of the stormwater facility portion of the project, the contractor shall plant the area with approved sod, plugs, container plants, or other means to complete the specified plantings and protect against erosion before water is allowed to enter the facility.

4.8.3 Irrigation

The applicant may choose how to irrigate such as by truck or irrigation system. However the City recommends onsite irrigation, with appropriate backflow prevention and winterization measures as necessary, to maintain the plant survivability. Temporary irrigation systems must be fully removed before the City releases the warranty surety (see **Section 9.8**).

4.8.4 Fencing and Handrails

Fences are required for all detention ponds with interior side slopes steeper than 3 feet horizontal to 1 foot vertical (3h: 1 v), or any walls/bulkheads greater than 24 inches in height. A pond with gently sloping sides (less than 3h: 1v) would not require a fence.

Designers are encouraged to **minimize or eliminate the need for fencing.** If fencing is required or used, the designer should use an aesthetic wall or fence related to the building/ site architectural style. In some locations, OCMC may prohibit fencing or require fencing to be screened with plantings. The designer is required to determine what sections of the OCMC apply to the project. If fencing is prohibited, the designer may have to change the facility design to eliminate fencing requirements.

Handrails shall be provided on the pedestrian side of stormwater planters or other stormwater management facilities with vertical sides that exceed 24 inches in depth.

4.9 Operation and Maintenance (O&M) Requirements

O&M requirements apply to all stormwater management facilities and related facility components. Owners are required to provide all-weather access for the City to inspect the facilities regularly to determine maintenance needs. See **Chapter 8** for O&M requirements.

4.9.1 General Maintenance Access

Publicly-maintained stormwater facilities must provide an access road designed and constructed for the intended use and purpose for accessing stormwater facilities. City-maintained facilities should be located on or directly adjacent to the public ROW. In locations where access roads are approved by the City, following are the minimum criteria required:

A. A site plan and profile of the access road.

B. Maximum grade: 12 percent.

C. Minimum width of surface: 12 feet.

D. Paved surfaces: 2-inch asphalt concrete (AC) thickness over 6”Aggregate Base.

E. AC paved surfaces shall extend to within 10 horizontal feet and 3 vertical feet of openings to all water quality and flow control structures unless otherwise approved by the City.

F. Access roads shall have an approved driveway approach from the public street and meet minimum design standards from Oregon City Municipal Code Title 17, except as modified by this section.

G. Maintenance road access for publicly-maintained facilities shall be shown on the recorded plat map and be situated in a separate tract and identified with the specific and intended use for maintenance access.

4.9.2 Detention Pond Interior Maintenance Access

Detention ponds shall have an access road suitable for maintenance equipment (backhoe, etc.) to safely access the interior bottom of the pond for the purpose of sediment removal. Minimum access road requirements are:

A. The interior pond access will begin at the edge of the required pavement and end within 3 vertical feet and 10 horizontal feet of the lowest elevation of the pond.

B. The minimum access road requirement is at least 10 feet wide with slopes no steeper than 18 percent. Curved alignments shall be 15 feet wide to accommodate equipment turning radius.

C. Access roads longer than 300 feet from a public right-of-way shall provide for a truck turn-around area.

D. Bollards shall be installed to limit vehicle access. Bollards shall consist of a fixed bollards on each side of the access road and two lockable, removable bollards equally located between the fixed bollards.

E. The pond interior access shall be constructed of a landscape block surface by removing all unsuitable material, laying a geotextile fabric over the native soil, placing landscape blocks, filling the honeycombs with topsoil, and planning appropriate zone grass. Other materials may be reviewed and approved on a case-by-case basis, provided they do not create additional impervious surface and will meet vehicle wheel load requirements.

CHAPTER 5

Conveyance System Design

CHAPTER 5. CONVEYANCE SYSTEM DESIGN

Stormwater conveyance system design is an integral component of stormwater management planning. Three considerations largely shape the design of conveyance systems: hazards to life (public safety), hazards to property (flooding), and hazards to habitat (water quality and erosion). Acceptable conveyance system design must maintain compatibility and minimize interference with existing drainage patterns, control onsite and downstream flooding of property, structures and roadways, and minimize the potential degrading environmental impacts of stormwater runoff.

This chapter includes guidelines as well as specific requirements for the design engineer developing the conveyance system for the stormwater management plan. The design requirements cover both open channel and closed conduit stormwater conveyance systems.

5.1 General Conditions

The following are the general conveyance requirements. It is understood that these are general guidelines and that every site will encounter specific issues regarding the overall conveyance system design.

A. The applicant is required to provide an acceptable point of discharge from the developed site. Generally, the point of discharge shall be discussed and deemed acceptable during pre-application by the City of Oregon City (City) prior to issuing the land use decision.

B. A development that requires connection to the public stormwater system shall provide connection points to allow all adjacent uphill parcels to be served by the stormwater system as the natural drainage patterns and future planning concerns dictate.

C. The City's construction standards and specifications, including acceptable materials, workmanship, fittings and installation, shall be followed for all aspects of conveyance design.

D. Conveyance systems shall be designed and constructed in compliance with requirements of all applicable federal, state, and local agencies. Written authorization of approval from other jurisdictions may be required at the discretion of the City.

E. A stormwater separated conveyance system may be required to accept and convey upstream offsite stormwater runoff through the site. See **Section 5.2.3** for upstream conveyance requirements.

F. Conveyance systems shall be designed and constructed to minimize downstream damage and erosion and to protect existing natural resources to the maximum extent practicable.

G. Conveyance systems shall be designed and constructed in accordance with floodplain management policies and regulations and other National Flood Insurance Program requirements and as determined by the City.

H. The owner is responsible for controlling the flows from springs and groundwater that surface during construction and within the warranty period of the drainage system.

I. Any proposed modification to the approved conveyance system plans shall be submitted to the City for review and approval prior to construction.

5.2 Stormwater Conveyance Requirements

Stormwater conveyance systems are to be designed to intercept and convey stormwater runoff efficiently enough to meet flood protection criteria. The conveyance system should complement the site design and structural stormwater controls to mitigate the major impacts of urban development.

5.2.1 Points of Discharge

The following considerations and/or limitations will be evaluated prior to approving the point of discharge:

A. The applicant will establish one or more acceptable points of discharge. Generally the points of discharge shall be accepted by the City prior to issuing the land use decision.

B. Runoff from developed portions of the site drainage basin should be discharged at the existing natural drainage outlet or outlets.

C. Runoff shall not be allowed to flow over adjacent public or private property at a rate, volume, or location materially different from that which existed before development occurred.

D. Runoff must be discharged in a manner that will not cause adverse impacts to downstream properties or previously constructed stormwater systems.

E. If the point of discharge is an open channel, then adequate velocity dissipation and/or additional channel protection shall be required to prevent erosion and/or alteration to the existing downstream drainageway.

F. Any connection to a public or private piped downstream stormwater conveyance system shall be approved by the City. The means and methods of connecting or extending a piped conveyance system will be consistent with City standards and/or other standards required by agencies that have the authority to regulate the connection.

G. When private property must be crossed to reach an approved point of discharge, the developer is responsible to acquire a recorded drainage easement from the property owner. The drainage easement must meet City approval.

5.2.2 Onsite Conveyance

The following onsite conveyance system requirements shall be incorporated into the design of the stormwater management plan:

A. The site shall be planned and designed to conform generally to onsite natural drainage patterns and discharge to natural drainage paths within a drainage basin. These natural drainage paths should be modified as necessary to contain and safely convey the peak flows generated by the development.

B. Open channel conveyance systems are preferred over closed conduits where feasible, especially where they might provide opportunities for water quality treatment, wildlife habitat improvement, or emergency overland flood relief routes.

C. In establishing the layout of stormwater networks, flows shall not discharge onto neighboring properties, except as under pre-development conditions.

D. It shall be the responsibility of the owner to provide a conveyance drainage system for all stormwater runoff and/or surface water entering the property from offsite. Surface water, springs, and groundwater shall be incorporated into the drainage design.

E. An overland emergency flow path must be identified and/or designed that allows large flow events to discharge without risk of injury or property damage. The emergency overland flow path must be incorporated into the design and show how a 100-year flow event will be accommodated. The emergency flow shall not be allowed to flow through or inundate an existing building. Any emergency overflow structures shall be designed to accommodate the 100-year design storm.

F. The onsite conveyance system shall be designed to reduce blockages and minimize the likelihood of nuisance flooding or damage to neighboring properties.

5.2.3 Upstream Drainage Basins

Developments are required to convey upstream drainage through or around the development using an integrated approach that plans for future development impacts.

A. The upstream offsite stormwater or other nuisance surface water runoff will be conveyed through the development in a separated conveyance system and will not be mixed with the stormwater collected and treated in onsite stormwater management facilities unless the onsite stormwater management facilities are designed to manage the additional flows from the upstream drainage basin(s), assuming full development potential.

B. Upstream drainage basin analysis shall assume ultimate buildout and/or maximum zoning density in determining the size of the separated conveyance system required through the site.

C. Generally, land use zoning adopted by the local planning agency will be used to size the capacity of the separated conveyance system for upstream basins.

5.2.4 Downstream Drainage Conveyance

The following downstream drainage conveyance system requirements shall be incorporated into the design of the stormwater management plan:

A. Stormwater runoff discharges shall not adversely affect the safety and/or flooding potential of adjacent or downstream property owners.

B. If the downstream analysis crosses the jurisdictional boundary of another surface water management agency, that agency must be notified and given the opportunity to review and comment on the analysis.

C. A written downstream analysis shall document existing conditions and demonstrate adequate conveyance capacity of the natural and constructed drainage system downstream of the project site.

D. The downstream analysis shall extend to the distance where the project site contributes less than 15 percent of the cumulative tributary drainage area **or** 1,500 feet downstream of the approved point of discharge, whichever is greater. In capacity constrained areas, the City may extend the distance of the required downstream analysis.

E. When downstream drainage conveyance systems are inadequate or systems are determined to be undersized, or when, in the opinion of the City, property or properties may be adversely affected by the existing and/or proposed stormwater release rates, the applicant may provide additional onsite stormwater flow control measures to reduce contributions to the downstream system, or correct and/or improve downstream drainage conditions so that the proposed stormwater release rates do not have to be restricted further.

F. The applicant is responsible to replace, repair, upsize, construct, or reconstruct the downstream conveyance system to provide the capacity necessary to develop the property. The downstream conveyance system may include any open or closed public or private stormwater conveyance system.

G. The applicant is required to identify all offsite downstream conveyance restrictions and the cost of upsizing/improving these conveyance systems to meet the minimum conveyance requirements established in this chapter.

H. Any offsite improvements will be the requirement and responsibility of the applicant to obtain easements, design approval, and authorization from all owners of any property and/or agency with the authority to regulate the activity. All agreements, easements, authorization and approvals shall be acquired prior to stormwater management plan approval.

I. Where no conveyance system exists at the adjacent down gradient property line and the discharge was previously un-concentrated or significantly lower concentrated flow, measures must be taken to prevent adverse downstream impacts.

5.3 Stormwater Conveyance Design Methods

The following section describes accepted criteria and methods for analyzing and designing stormwater conveyance systems. It is the responsibility of the project engineer to determine the appropriate method of analysis in determining the capacity of the proposed conveyance system.

5.3.1 Design Event

The design event for sizing each component of the stormwater conveyance system is determined based on the size of the contributing drainage area and the type of conveyance system being designed. The design events for conveyance system sizing are listed in **Table 5-1**. Design rainfall intensities and 24-hour storm events are included in **Section 5.3.3 and 5.3.4**.

Table 5-1. Conveyance System Design Storms

Contributing drainage area	Design storm for conveyance system sizing		
	Storm sewer, culverts, and outfall pipes[a]	Creek or stream channels	Bridges
Less than 40 acres	10-year, 24-hour storm	10-year, 24-hour storm	100-year, 24-hour storm
40 to 640 acres	25-year, 24-hour storm	25-year, 24-hour storm	
640 acres or greater	50-year, 24-hour storm	50-year, 24-hour storm	

[a] *When a backwater condition exists, the storm drain system shall be designed to convey and contain at least the peak runoff for the 25-year design storm as described in* ***Section 5.3.6.***

5.3.2 Design Methodology

The following are general design considerations for conveyance sizing requirements:

A. Conveyance systems shall be designed and constructed to carry the design storm flowing full with no pressure flow. Flow conditions in existing pipe systems will be evaluated on a case-by-case basis for adequacy.

B. Conveyance systems in the public right-of-way (ROW) shall be designed as gravity systems, without the use of stormwater pumps. Privately-owned and maintained stormwater pumps may be allowed with City approval as described in **Section 5.13**.

C. The Rational Method for computing peak discharge is preferred by the City. The Rational Method shall be used for all existing and proposed conveyance systems that receive drainage from contributing areas of 25 acres or less and that have a time of concentration (Tc) of less than 100 minutes. For all other conditions, an approved hydrograph method (ex. Santa Barbara Urban Hydrograph (SBUH), Natural Resources Conservation Service (NRCS) Method, or Technical Release 55 (TR-55)), stormwater management model (SWMM), or other standard methods as approved by the City shall be used.

D. Manning's equation generally shall be acceptable for determining pipe or open channel capacity for drainageways with a contributing area of 50 acres or less. For larger drainage areas, backwater effects shall be included in determining capacity for a drainageway, typically using HEC RAS or equivalent computer modeling software.

5.3.3 Rational Method

The Rational Method is most accurate for runoff estimates from small drainages with large amounts of impervious area, as is typical within Oregon City. When using the Rational Method, refer to the Oregon Department of Transportation (ODOT) *Hydraulics Manual* for calculation formulas and tables of coefficients.

When using the Rational Method, the following limitations shall apply:

A. Use the Rational Method only for predicting a conservative peak flow rate to be used in determining the required capacity for conveyance elements. The Rational Method shall not be used to size stormwater management facilities.

B. The drainage subbasin area cannot exceed 25 acres and the time of concentration shall not exceed 100 minutes for a single calculation.

C. The rainfall intensity (I) should be based on the rainfall intensity, duration, and frequency curve shown in **Figure 5-2**.

D. In computing the Time of Concentration (Tc), for smaller basins, the largest and most significant component in the total Tc is the portion of the time devoted to sheet flow. For this reason, extreme care should be given to determining the true travel time for the sheet flow component of the Tc. In calculating the total Tc, the following limitations will apply:

1. The flow segment used for the sheet flow component shall not extend for more than 300 feet. The use of a distance of less than 200 feet on a pre-developed land use will require supporting documentation, such as photographs that show evidence of shallow concentrated flow at the point of transition.

2. For segments of the Tc route that flow through closed conveyance facilities, such as pipes and culverts, use standard hydraulics formulas for establishing velocity and travel time.

3. For segments of the Tc route that flow through lakes or submerged wetlands, travel time is normally very short. The travel time can be determined using an appropriate storage routing technique, or it can be assumed to be zero.

4. The minimum total Tc used in the runoff calculations shall be 5 minutes.

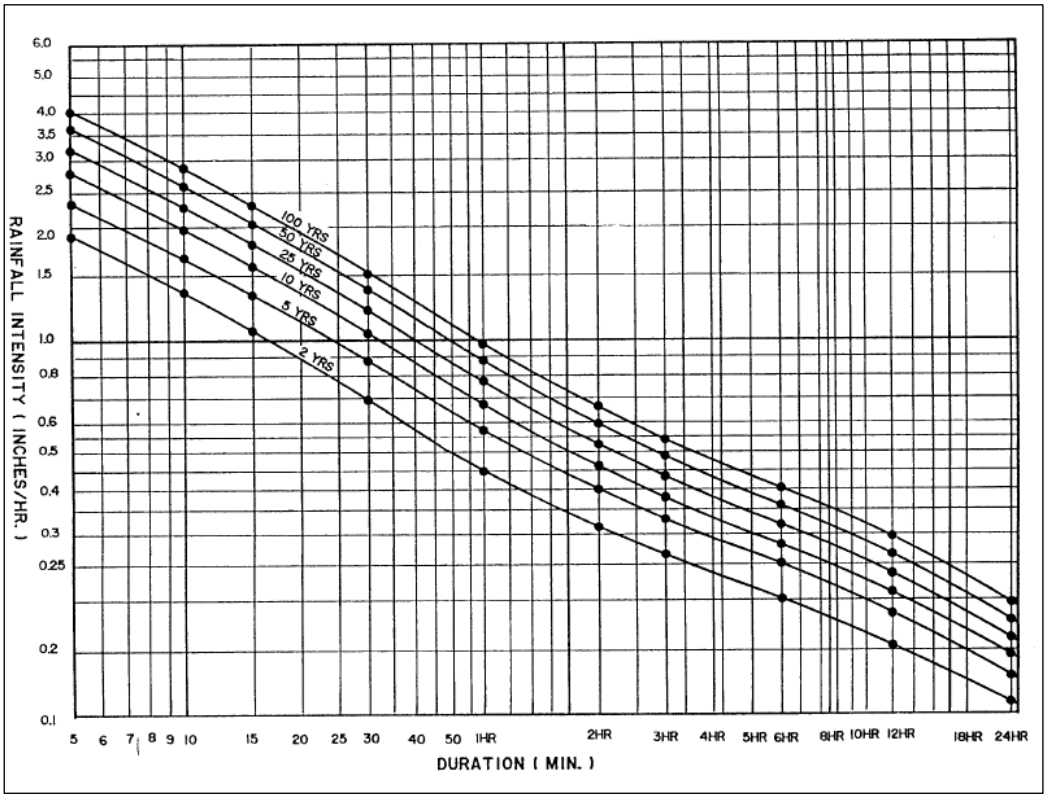


Figure 5-2. Rainfall intensity, duration, and frequency curves for Oregon City

Source: Oregon City Storm Drainage Master Plan, 1988

5.3.4 Hydrograph Method

When storm runoff conveyance design calculations are based on SBUH, TR-55 or the SWMM method, the calculations shall have the following limitations:

A. The rainfall distribution to be used within the city is the design storm of 24-hour duration based on the standard NRCS Type 1A rainfall distribution using the 24-hour precipitation isopluvials in the National Oceanic and Atmospheric Administration Atlas 2, Volume 10, *Precipitation-Frequency Atlas of the Western United States*. The depth of rainfall for the 2 through 100-year 24-hour storm events is shown below in **Table 5-2**.

B. Curve numbers shall be derived from the NRCS runoff curve numbers contained in TR-55 *Urban Hydrology for Small Watersheds*.

C. Soil types shall be derived from the NRCS Soil Survey for Clackamas County.

D. A maximum overland distance for sheet flow used in calculations shall be 300 feet.

E. The minimum time of concentration shall be 5 minutes.

See **Appendix H** for additional guidance on performing hydrograph method calculations.

Table 5-2. 24-hour Rainfall Depths in Oregon City

Recurrence Interval, Years	24-Hour Depth, Inches
2	2.8
10	3.5
25	4.0
50	4.4
100	4.5

Source: NOAA Atlas 2, Volume X

5.3.5 Capacity Analysis: Non-pressure Flow

Storm drains that are designed to operate at full or partially-full conditions during the design storm are called non-pressure flow. The capacity of pipe systems and open channels, for non-pressure flow conditions, can often be estimated using Manning's equation for steady uniform flow as follows:

Manning's Equation

$$Q = \left(\frac{1.486}{n}\right) AR^{2/3} S^{1/2}$$

or

$$V = \left(\frac{1.486}{n}\right) R^{2/3} S^{1/2}$$

where: Q = flow in cubic feet per second (cfs)

n = coefficient of roughness

A = cross sectional area of flow in square feet

V = Velocity, fps

R = hydraulic radius in feet = A/WP

(WP = wetted perimeter = length, in feet, of the wetted contact between a flow of water and its containing channel, measured at right angles to the direction of flow)

S = hydraulic slope (or hydraulic grade line) in feet per foot

The hydraulic slope or hydraulic grade line (HGL) is defined by the elevations to which water will rise in small vertical pipes, located at various locations along the flow. In a non-pressure flow condition, the hydraulic slope can be assumed to be parallel with the flow line slope. The HGL is separated from the energy line by the velocity head. The energy grade line is the sum of the HGL, the velocity head, friction loss, and the incidental losses. Manning's equation does not take into account entrance, exit, bend, and junction losses within catch basins or manholes.

Typical values for the hydraulic roughness coefficient (Manning's n) for conduits and channels can be found in **Tables 5-3 and 5-4**. Refer to the ODOT *Hydraulics Manual* for additional hydraulic roughness values.

This capacity estimate using the Manning equation is acceptable for final design purposes if the conveyance system does not have tailwater influence (such as discharge into a partially full detention basin) or abrupt changes in channel cross-section or slope that might cause non-uniform flow.

Table 5-3. Normal Range Hydraulic Roughness Coefficient (Manning's n) for Conduits

Type of Pipe Material	Manning's n (normal)
Concrete	0.013
Ductile iron	0.012
Corrugated metal (CMP) - annular - 2-2/3" x 1/2"	0.024
CMP - annular – 3" x 1"	0.027
CMP - annular – 6" x 2"	0.032
CMP - helical- 2-2/3" x 1/2"	
12-inch diameter	0.013
18-inch diameter	0.015
24-inch diameter	0.017
36-inch diameter	0.021
48-inch diameter	0.023
60-inch diameter and larger	0.024
Corrugated high-density polyethylene (CPEP) - single wall	0.024
CPEP - smooth wall	0.012
Spiral rib metal	0.011
Poly-vinyl chloride (PVC)	0.011
High density polyethylene (HDPE) - butt fused	0.009

Note: These n values are the "normal" range hydraulic roughness coefficient values for use in the analysis of conduits. Refer to the ODOT Hydraulics Manual *for additional reference values.*

Table 5-4. Normal Range Hydraulic Roughness Coefficient (Manning's n) for Channels

Type of channel	
Constructed	**Natural**
A. Earth, straight and uniform	**A. Minor streams (top width at flood stage less than 100 feet)**
1. Clean, recently completed 0.018	1. Streams on plain
2. Clean, after weathering 0.022	a. Clean, straight, full stage, no rifts or deep pools 0.030
3. Gravel, uniform section, clean 0.025	b. Same as above, but more stones and weeds 0.035
4. With short grass, few weeds 0.027	c. Clean, winding, some pools and shoals 0.040
B. Earth, winding and sluggish	d. Same as above, but some weeds and stones 0.045
1. No vegetation 0.025	e. Same as above, lower stages, irregular slopes and sections with more ineffective flow area 0.048
2. Grass, some weeds 0.030	f. Same as d, but more stones 0.050
3. Dense weeds or aquatic plants in deep channels 0.035	g. Sluggish reaches, weedy, deep pools 0.070
4. Earth bottom and rubble sides 0.030	h. Very weedy reaches, deep pools, or floodways with heavy stand of timber and underbrush 0.100
5. Stony bottom and weedy banks 0.035	2. Mountain streams, no vegetation in channel, banks usually steep, trees and brush along banks submerged at high stages
6. Cobble bottom and clean sides 0.040	a. Bottom: gravels, cobbles, and few boulders 0.040
C. Rock cuts	b. Bottom: cobbles with large boulders 0.050
1. Smooth and uniform 0.035	**B. Floodplains**
2. Jagged and irregular 0.040	1. Pasture, no brush
D. Channels not maintained, weeds and brush uncut	a. Short grass 0.030
1. Dense weeds, high as flow depth 0.080	b. High grass 0.035
2. Clean bottom, brush on sides 0.050	2. Cultivated areas
3. Clean bottom, brush on sides, highest stage of flow 0.070	a. No crop 0.030
4. Dense brush, high stage 0.100	b. Mature row crops 0.035
	3. Brush
	a. Scattered brush, heavy weeds 0.050
	b. Light brush and trees 0.050
	c. Medium to dense brush 0.070
	4. Trees
	a. Dense willows, straight 0.150
	b. Cleared land with tree stumps, no sprouts 0.040
	c. Cleared land with tree stumps, heavy growth of sprouts 0.060
	d. Heavy stand of timber, a few down trees, little undergrowth, flood stage below branches 0.100
	e. Same as above, but with flood stage reaching branches 0.120

Note: The n values listed above are the "normal" range hydraulic coefficient values for use in the analysis of open channels. For conservative design of channel capacity the "maximum" values listed in the ODOT Hydraulics Manual *should be considered. For channel bank stability calculations, the "minimum" values listed in the ODOT* Hydraulics Manual *should be considered.*

5.3.6 Capacity Analysis: Pressure Flow

A backwater analysis shall be included in the stormwater management plan for the following circumstances:

A. Where uniform flow is not expected or where losses within the system may cause surcharging of water.

B. A discharge into a tailwater condition, such as a partially full stormwater detention pond or into a partially full channel.

C. Culvert entrances.

D. Ditch inlet location where backwater effect could cross a property line.

E. Other locations as determined by the City Engineer.

The backwater analysis shall be to a point where non-pressure flow at the design storm flow rate is re-established.

When a backwater condition exists, the storm drain system shall be designed to convey and contain at least the peak runoff from the 25-year design storm or the design storm identified in **Table 5-1**, whichever is larger.

Structures for proposed pipe systems must be designed to provide a minimum of 1 foot of freeboard between the HGL and the top of the stormwater structure and appurtenances or finish grade above the pipe during the design flow. Surcharge in pipe systems shall not be allowed if it will cause flooding in portions of a structure, including below-floor crawl spaces and basements.

5.3.7 Hydrologic and Hydraulic Calculation Reporting

Design hydrologic and hydraulic data for each reach of a proposed storm drain system shall be included in the stormwater management plan submittal. It is the responsibility of the project engineer to determine the best way to document the design analysis for presentation in the report. Conveyance calculations shall include the following items:

A. Description and sketch of the storm drain system, including pipe size, slope, and material for each segment of the system.

B. Description and sketch of the contributing area (curve number value or equivalent, as well as the size).

C. Time of concentration calculations, including assumed coefficients, flow path lengths, and slope.

D. Capacity analysis calculations as outlined in **Sections 5.3.5 and 5.3.6**.

E. Design flow calculations, including assumed coefficients and design storm.

F. Design flow rate for each pipe and open channel segment of the onsite conveyance system.

G. HGL and ground surface elevation at each structure and outlet location. It is preferable to show this information on a profile plot on an engineering scale, though spreadsheet tables are acceptable. When spreadsheet tables are used in place of a profile plot, include the distance between the ground surface and the HGL at each structure and outlet location.

H. Flow velocity at outlet structures and in open channels.

5.4 Open Channels

The following section describes accepted criteria and methods for designing open channel conveyance systems, such as swales and ditches.

5.4.1 Geometry

Open channel geometry shall meet the following criteria:

A. Constructed open channels shall be sized to pass the design flows listed in **Table 5-1** without causing erosion.

B. Channel side slopes shall be no steeper than two-horizontal to one-vertical (2h:1v) for undisturbed ground (cuts), as well as for disturbed ground (embankments). All constructed channel slopes shall conform to compaction guidelines in **Chapter 3**.

C. A low-flow channel, within the main channel, designed to carry 10 percent of the design storm, will be required for channels with a design flow of greater than 20 cubic feet per second (cfs). Side slopes for the low-flow channel shall not exceed 2h:1v and shall be stabilized to the satisfaction of the City Engineer. The minimum stabilization material shall be seeded matting or approved equivalent.

D. Channel design along curves shall be curvilinear with a 100-foot minimum radius. Tighter curves may be used if the City Engineer determines that sufficient erosion control has been incorporated into the design to maintain stable bank conditions following development.

E. Channels shall be designed to provide sufficient freeboard so as not to saturate any adjacent public road base with design storm peak flows. Channels shall have a minimum freeboard of 6 inches when the design discharge is 10 cfs or less and 1 foot when the design discharge is greater than 10 cfs. Extra freeboard may be required for curved segments of an open channel.

5.4.2 Channel Lining and Infiltration

Every opportunity should be taken to design open channels to provide infiltration throughout an entire drainage system. Engineers are also encouraged to consider innovative means of collecting and conveying runoff to incorporate infiltration into the drainage system design.

Protection for open channels shall meet the following criteria:

A. Vegetation-lined channels shall be used whenever practicable. Rock-lined channels shall be used only where a vegetative lining will not provide adequate protection from erosion.

B. If the channel has a flow line slope of 6 percent or greater or a peak design velocity that exceeds 4.0 feet per second (fps), the channel shall incorporate rock lining or riprap energy dissipation devices designed by a qualified Professional Engineer. Channel protection shall be based on the minimum level of protection listed in **Table 5-5**.

C. Where riprap protection is specified, riprap shall be placed over a woven geo-textile fabric.

D. No protruding pipes, culverts or other structures, which reduce or hinder the flow characteristics of the channel, will be allowed. Channel connections shall be designed to prevent scouring. All pipe connections shall match side slopes and incorporate a headwall.

E. All channel sides and bottoms shall be seeded, sodded, or rock-lined immediately following excavation, regardless of mean flow velocity.

Table 5-5. Protection for New Channel Construction

Velocity at design flow, fps		Required protection	Thickness, feet	Minimum height above design water surface, feet
Greater than	Less than or equal to			
0	5	Vegetation lining	Not applicable	0.5
5	8	Bioengineered lining	Not applicable	1
		ODOT Class 50 riprap[a]	1.5	
8	12	ODOT Class 200 riprap	2.5	2
12	20	Slope mattress, etc.	Varies	2
20		Engineer-designed		

[a] *The City may require ODOT Class 100 Riprap on an as needed basis.*

5.4.3 Open Channel Location

New open channels in residential areas shall be in private or public easements and recorded on plat maps with the following restrictions:

A. Property owner shall not alter the drainageway without approval of the City Engineering Division.

B. Property owner shall not place any structure or fence within the normal high water area of the open channel.

C. Property owner shall not introduce foreign material such as grass clippings within the high water area of the open channel.

5.4.4 Check Dams

Check dams are not recommended for use in conveyance channels due to the problems they pose for routine maintenance operations. However, check dams are recommended for use in temporary or permanent channels as an erosion and sedimentation control device (see **Chapter 7**) and for stepping down channels being used for infiltration. Where check dams are proposed, they shall be spaced at maximum 2-foot elevation intervals.

5.4.5 Work near Existing Natural Channels

All work near natural channels shall be consistent with Oregon City Municipal Code (OCMC Title 17) Natural Resource Overlay District (NROD) requirements.

5.5 Culverts

Culverts, for the purposes of this manual, are single runs of pipe that are open at each end and do not have structures such as catch basins or manholes. Culverts designed for fish passage are governed by the Oregon Department of Fish and Wildlife and often require additional design considerations such as depth of flow and velocity that may differ considerably from the design requirements included herein. When conflicts exist, the applicant shall work with the City and the regulating agency to establish the appropriate design criteria.

5.5.1 Culvert Design Criteria

Stormwater conveyance culverts shall meet the following design criteria:

A. Maximum design headwater depth shall be 1.5 times the diameter of the culvert, with no saturation of roadway subgrade.

B. Minimum culvert diameters are as follows:

- For cross-culverts under public and private roadways: minimum 18 inches.
- For all other roadway culverts, including driveway culverts: minimum 12 inches.

C. No bends shall be permitted in culvert pipes.

D. Minimum cover, as measured from the bottom of roadway subgrade:

1. Under roads classified as collectors or higher: 2 feet.
2. If Class 52 ductile Iron pipe is used, the cover may be reduced to 1 foot.
3. PVC and HDPE shall require a 2-foot minimum cover in any public roadway area.
4. Pipe covers of less than the above stated minimums may be permitted on a case-by-case basis. These may require a designed reinforced concrete cover that will distribute roadway use (traffic) forces to a foundation area to the sides of the pipe.
5. Reinforced concrete box (RCB) culverts with no cover requirement may be permitted on a case-by-case basis. Signed and sealed structural design calculations shall be submitted for review (this requirement may be waived for pre-cast RCB culverts with covers greater than 2 feet). In culverts with no cover, the clearance from the roadway surface to the reinforcing steel shall be no less than three inches and the 30-day concrete strength shall be no less than 4,500 pounds per square inch.

E. Maximum culvert length without access structures is 300 feet.

F. Minimum separation from other utility pipes and conduits (as measured from the outside edge of pipe) is 6 inches vertical, 3 feet horizontal, unless otherwise specified by the purveyor of the utility in question.

G. Pipe bedding and backfill shall conform to City's Public Works standards.

H. The entrances and outlets to all culverts shall be stabilized with quarry rock or other energy dissipation methods to minimize scouring of the channel bottom and sides. These shall be designed by a Professional Engineer using published references such as Hydraulic *Design of Energy Dissipaters for Culverts and Channels* (U.S. Department of Transportation, Federal Highway Administration) and other references.

I. Rock protection at culvert entrances should extend upstream a minimum of 5 feet and shall have a minimum height of 1 foot above the design headwater elevation. Rock protection at the culvert outlet shall have the greater of:

- A minimum height of 1 foot above the design tailwater elevation
- 1 foot above the crown of the pipe

J. When two parallel pipes are installed, the minimum separation between the exterior pipe walls shall be 3 feet or half the diameter of the larger pipe, whichever is greater. Pipe separations less than the stated minimum may be permitted on a case-by-case basis.

5.5.2 Culvert Materials

The culvert materials listed in **Table 5-6** are approved for use for culverts, subject to the limitations listed in the table or in **Section 5.5.1**.

Table 5-6. Approved Pipe and Culvert Materials [a]

- Reinforced Concrete Pipe, ASTM C-76, Class III minimum. Watertight joints required.
- Ductile Iron; Class 50 wall thickness for pipe sizes up to 12 inches; Class 51 wall thickness for 14 inch and larger; water tight gaskets required.
- Corrugated high-density polyethylene pipe (HDPE) - smooth interior (ADS N-12 or equivalent, maximum 30-inch diameter conforming to American Association of State Highway and Transportation Officials (AASHTO) M-294, Type S) with watertight gaskets. Concrete headwalls are required for any exposed ends.
- PVC seamless pipe with water tight gaskets:
  - ASTM 3034 SDR 35 for pipes up to 15-inch-diameter
  - ASTM F679, for pipes 18 to 27 inches in diameter
  - ASTM C900 DR18 for pipes up to 12-inch-diameter
  - ASTM C905 DR 25 for pipes 14 to 30 inches in diameter
  - ASTM F-794 for pipes up to 30-inch-diameter
  - Concrete headwalls are required for any exposed ends

[a] *These pipe materials are allowed for public storm drainage conveyance systems. The City Engineer may adopt or approve other pipe materials or specifications due to technology developments.*

5.5.3 Headwalls/Endwalls

Concrete headwalls are required for all culverts. End protection shall conform to the City's Public Works Standards. No plastic pipes shall be exposed, which may require pipe transitions from underground plastic to exposed ductile iron pipe.

5.5.4 Location

Culverts located within the structural street section shall be placed as shown on the City's Standard Drawing for utility placement location.

5.6 Pipe Systems

Pipe systems are comprised of more than one run of pipe and include at least one junction-type of structure such as a catch basin or manhole. The following section describes accepted criteria and methods for designing pipe systems.

5.6.1 General Pipe Design Criteria

Pipe systems shall meet the following design criteria:

A. Pipe cover, as measured from the bottom of roadway subgrade:
   - Minimum cover of 2-feet under collector and above roads.
   - If Class 52 ductile iron pipe or Class V concrete pipe is used, the cover may be reduced to 1 foot.
   - PVC and HDPE shall require a 2-foot minimum cover in any public roadway area.
   - In areas of relatively flat terrain, the project engineer must show that sufficient depth is provided at the boundary of the development to properly drain the remainder of the upstream basin area tributary to the site.
   - The Oregon Structural Code (OSC) typically requires 1-foot minimum cover on private property where the system will be privately maintained.
   - Pipe covers of less than the above stated minimums may be permitted on a case-by-case basis, as approved by the City Engineer.

B. Velocity:
   - Minimum velocity: 2.5 fps at design flow rate.
   - Maximum velocity: 15 fps at design flow rate.
   - Where velocities greater than 10 fps are attained, special provision shall be required to protect structures against pipe erosion and displacement by shock. Energy dissipaters located on sloping land are of particular concern. This condition shall be studied in each case and the results of the study shall be documented in the drainage report.

C. Pipe Diameter:
   - Minimum of 12-inch pipe diameter for stormwater systems within the ROW.
   - Storm lines shall not decrease in size as they move downstream, regardless of the slope provided on the pipe.

D. Maximum pipe length of 400 feet between access structures.

E. Minimum separation of 6 inches vertical, 3 feet horizontal from other utility pipes and conduits, unless otherwise specified by the purveyor of the utility in question. The separation shall be measured from the outside edge of pipe.

F. Debris grates shall be installed at all inlets where an open channel discharges to a piped drainage system. Additionally, debris grates are required at all outlets of piped systems where the pipe is 18 inches in diameter or larger.

G. All pipe lengths and slopes shown on construction plans shall be based on measurements from center of structure to center of structure.

H. Pipe trench backfill: Bedding and backfill shall conform to the City's Public Works standards.

I. Slope:

- Minimum pipe slope of 0.5 percent. Exceptions may be made for topographic constraints, provided the minimum flow velocity is maintained.
- Storm drains laid on slopes of 20 percent or greater shall be secured by anchor walls. Concrete pipe shall not be used when slopes exceed 25 percent due to the potential for joint displacement from differential settlement.

J. Alignment:

- Storm drains shall be laid on a straight alignment. Horizontal curves that conform to the street curvature may be approved if joints with rubber gaskets are used for all curved storm drains. Minimum radii shall be 115 percent of the pipe manufacturer's recommendation.
- Changes of alignment greater than 45 degrees at any main flow structure for the main flow are undesirable. Changes of alignment greater than 90 degrees for the main flow will not be allowed.
- Side pipes will join in such a manner that all flows enter the manhole point downstream. Side pipes with discharges pointed in an upstream direction will not be allowed.

5.6.2 Pipe Material

The pipe materials listed in **Table 5-6** are approved for use in pipe systems, subject to the limitations listed in the table and **Section 5.6.1**.

5.6.3 Connections to Pipe Systems

For all piped public drainage systems, excluding roof and foundation line, connections may only be made at a structure, such as at a catch basin or manhole. Tees, wyes, saddles, or other types of connections to storm drainage pipes for other than roof and foundation line, will not be permitted.

Lateral connections within the ROW shall not exceed half the diameter of the mainline and cannot exceed 8 inches in diameter. For larger connections, a structure for maintenance access is required.

Private storm drains outside the public ROW shall not be less than 6 inches in diameter and must meet local plumbing authority codes.

Storm pipes serving only roof drain laterals with no expectation for upstream future connections may be 8 inches in diameter. Storm sewer service laterals serving an indi-

vidual house or small commercial property shall be 6 inches in diameter or as approved by the City.

5.6.4 Location

Where storm drains are being designed for installation parallel to other utility pipe or conduit lines, the vertical location shall be in such a manner that will permit future connections. The design must also avoid conflicts with parallel utilities without abrupt changes in vertical grade.

5.6.5 Storm Drains in Streets or Easements

All public storm drains not located in streets shall be in easements. See City's Standard Drawings for "Typical Utility Placement Detail".

If streets have curved alignments, whenever possible, the storm drain alignment shall be parallel with water and sanitary lines with a minimum separation of 10 feet with sanitary and 6 feet with water. The intent is to prevent conflict with sanitary and water lines while providing the fewest manholes required to traverse on curve, and prevent a conflict with survey monuments required by OCMC.

Storm drains in easements will be allowed only after all reasonable attempts to place the drains in the ROW have been exhausted. Provisions shall be made for vehicular access to manholes for preventive maintenance and emergency service. See **Section 5.9** for more discussion on easements.

5.6.6 Relation to Creeks and Drainage Channels

Storm drain lines shall enter a creek or drainage channel at 90 degrees or less to the direction of the flow. The outlet shall have a headwall and scour pad or riprap to prevent erosion of the existing bank or channel bottom. The size of the pipe and channel being entered will govern which protective measures are required.

5.7 Structures

The following are design criteria for conveyance system structures.

5.7.1 Manholes

A. Manholes or curb inlets with manhole-type access shall be installed at all pipe junctions where the depth from rim to invert exceeds 4 feet or where the pipe is 18 inches in diameter or greater.

B. Manholes shall conform to the City's applicable standard drawings.

C. Where minimum vertical distance is proposed between inlet and outlet pipes in a manhole (or inlet structure serving as a junction structure), pipes must be aligned vertically by one of the following criteria, in order of preference:

- Match pipe crowns
- Match 80 percent diameter of pipes
- Perform backwater analysis

D. Manholes shall be required at, but not limited to, the following locations:

- Changes in vertical grade or horizontal alignment of storm drain pipes
- Change in size of storm drain pipes
- Uppermost extent of storm pipe not opened (daylighted) to receive ditch or other open conveyance flows. Cleanouts are not allowed in this situation.

E. Manholes with pipe horizontal alignment changes of more than 30 degrees in angle shall have the outlet pipe invert at least 0.2 foot in elevation lower than all inflow pipe inverts. This is in addition to the normal grade crossing the manhole.

F. In addition, a minimum 3-foot elevation difference between the rim and the top of pipe at all manholes with more than 30 degrees of alignment change is required. This is to allow for containment of turbulence generated during high flows by such abrupt changes of alignment.

G. Standard depth manhole rim frames shall be installed in all paved street locations.

H. Outside drop manholes shall be used where the difference in the flow line elevations between intersecting storm sewers exceeds 24 inches, except in inlet runs. Inside drop manholes are prohibited.

I. Manhole rims not in pavement areas, and not in the pavement section of a paved road, shall be set 6 inches above finished grade. Covers shall be bolted down with a minimum of two stainless steel bolts.

5.7.2 Inlet Structures

A. Inlet structures are required at the following locations, but in no case shall they be spaced farther apart than 400 feet:

- At the ends of all dead-end streets with a descending grade.
- At intermediate locations so that the maximum gutter flow does not exceed the shoulder width plus 2 feet of the travel lane. This maximum flow is for a 5-minute, 10-year design storm, or 3 inches in depth (measured at the curb face), whichever is less.
- At all sag points (low points) in vertical curves.
- On the uphill side of handicap ramps within 20 feet.
- Inlet structures shall not be located where they will interfere with a handicap ramp.

B. Inlet structures located in street sections where there is curb and gutter shall be a curb inlet per City standards, unless otherwise approved by the City Engineer.

C. Inlet structures that have an outlet pipe located lower than 4 feet below the street flow line shall have minimum inside dimensions of 3 feet 3 inches by 2 feet 3 inches.

D. With the City's written approval, inlet structures may be used in lieu of manholes for the junction of pipes 15 inches or less in diameter, where the depth from rim to invert is less than 4 feet. Pipelines 18 inches in diameter may be connected to the larger dimension of the structure (catch basin) when the structure is formed and poured around the pipe during new construction. The minimum size for a catch basin/inlet structure shall be per the City's requirements.

E. Catch basins with connector storm drains shall connect to a receiving conveyance pipe with a manhole, another catch basin, or gutter inlet.

F. Gutter tapers are required for all catch basins and gutter/curb inlets and shall conform to the City's Standard Drawings.

G. Ditch and/or area inlets shall be required to intercept existing flows.

5.8 Outfalls

Outfalls from drainage facilities shall be designed with adequate energy dissipaters to minimize downstream damage and erosion. All outfalls with exit velocities of more than 4 fps shall be examined with respect to soil type to ensure adequate erosion control. Unless otherwise approved, an outfall elevation shall be submerged by the receiving creek or channel during a 10-year storm event.

Storm drain lines shall enter a creek or drainage channel at 90 degrees or less to the direction of the flow. The outlet shall have a headwall and scour pad or riprap to prevent erosion of the existing bank or channel bottom. The size of the pipe and channel being entered will govern which protective measures are required.

Engineered energy dissipaters, including but not limited to, stilling basins, drop pools, hydraulic jump basins, baffled aprons, and bucket aprons, shall be designed using published references such as *Hydraulic Design of Energy Dissipaters for Culverts and Channels* published by the Federal Highway Administration of the U.S. Department of Transportation, the ODOT *Hydraulics Manual* and others. The design reference shall be cited in the stormwater management plan submittal.

Rock protection at outfalls shall be designed in accordance with information listed in **Table 5-7**.

Table 5-7. Rock Protection at Outfalls

Discharge velocity at design flow, fps		Minimum required protection dimensions				
Greater than	**Less than or equal to**	**Type**	**Thickness, feet**	**Width**	**Length (use greater of)**	**Height over crown, feet**
0	5	ODOT Class 50 Riprap[a]	1.5	Diameter + 6 feet	8 feet –OR- 4 x diameter	1
5	10	ODOT Class 200 Riprap	2.5	Diameter + 6 feet	12 feet –OR- 4 x diameter	1
10		Engineered energy dissipater required				

[a] *The City may require ODOT Class 100 Riprap in areas with likelihood of vandalism.*

If the outfall is located in an OCMC defined NROD or a FMOD, additional requirements may apply. A permit from the USACE and/or the ODSL may be required. The applicant is responsible for obtaining the proper permits from the regulating agencies.

5.9 Easements and Setbacks

Drainage easements for the stormwater conveyance system must meet the following criteria:

A. Minimum width of 15 feet, with the exception that private roof and yard drain systems that may be located within 10-foot private storm easements.

B. All pipes must be located within the easement so that outside edge of pipe, or top edge of channel, is no closer than 5 feet from its adjacent easement boundary (roof and yard drain pipes shall be centered in the easement).

C. Open channels shall be located within the easement so that the water surface elevation at the top of freeboard is no closer than 5 feet from each easement boundary.

D. The City may require wider easements for large trunk sewers, sewers greater than 10-feet deep and areas with topographic constraints, such as steep slopes or sites where maintenance, repair, or replacement would require a wider easement. When wider easements are required, easement widths shall be increased in 5-foot increments.

All easements must be furnished to the City for review and approval prior to recording. The City has standard utility easement document forms and guidelines for preparation of descriptions and sketches that shall be used for City easements.

5.10 Slope Intercept Drains

Slope intercept drains are allowed at the following locations:

A. Along the upper boundaries of a development where the natural ground slope exceeds 10 percent to prevent drainage from the tributary area above the site.

B. Along the top of all cut slopes which exceed two-horizontal to one-vertical (2h:1v) where the tributary drainage area above the cut slope has a drainage path greater than 40 feet as measured horizontally from the hinge point of the cut.

5.11 Subsurface Drainage

Subsurface drains (underdrains) shall be provided at the following locations:

A. For stability on cut and fill slopes, when required by the City Engineer.

B. For all existing springs or springs intercepted during construction activity for other facilities.

C. Where high groundwater exists or when it is necessary to reduce the piezometric surface to an acceptable level to prevent land slippage or under floor flooding of buildings.

D. Where possible, a minimum slope of 0.15 foot per 100 feet should be used. The subsurface drain must be installed below the water flow to function properly. The use of a geotextile fabric to line the trench is recommended.

See APWA Standard Drawing 307-A for design of subsurface drainage.

5.12 Foundation Drains

The following drainage provisions shall be made for foundation drains in a development:

A. For commercial or industrial developments, foundation drains shall be piped directly to a storm drain system other than a street gutter. Provisions must be taken so that the design HGL of the receiving stormwater facility does not back up into the foundation drain.

B. For single-family residential developments, foundation drains may be piped to the street through a plastic pipe, as required by applicable code, and set in the curb under the following circumstances:

- The building's top of foundation elevation for the first floor is at least 2 feet above the top of the existing street curb, and
- The existing street section will not permit runoff to flow horizontally more than 2 feet beyond the discharge point. This is to prevent wetting the road surface, especially during freezing events.
- Otherwise, foundation drains shall be piped directly to a storm drain system other than a street gutter.

C. Should site topography prevent connecting foundation drains directly to a public storm drain system, the drains for one or more lots shall be piped through a private system to the public storm drain system. This private system shall be located in a dedicated private drainage easement and the property owner shall be responsible for the private system maintenance. Any private storm drain piping shall conform to the Oregon Plumbing Code.

5.13 Design Criteria for Private Stormwater Pumps

Private stormwater pumps will be permitted only after approval by the City Engineer. Any stormwater pumps so permitted must, at a minimum, meet the following criteria:

A. The proposed pump system is not intended to circumvent other drainage requirements.

B. The proposed pump system is the only feasible alternative to flooding.

C. The pump system must provide storage for a minimum of 25 percent of the runoff volume from a 2-year, 24-hour storm event. An emergency backup power source may be required, at the discretion of the City Engineer.

D. The pump system must include dual pumps with an external audible and visual alarm system.

E. The pump system must be capable of discharging a 100-year storm event.

F. Applicants may be required to provide reasonable assurance of no downstream impacts from the implementation of a stormwater pump system.

G. Private conveyance systems for the pump system must transition to gravity flow, prior to entering the public ROW and must have a gravity connection to the public stormwater system.

H. All pump systems must be privately operated and maintained. Prior to final approval of the project served by such a pump system, an agreement establishing responsibility for payment of costs resulting from the operation and maintenance of the pump system must be approved by the City and must be legally recorded.

I. An operations and maintenance plan and maintenance covenant, consistent with **Chapter 8** shall be developed for all private stormwater pumps**.**

CHAPTER 6

Source Controls

CHAPTER 6. SOURCE CONTROLS

This chapter presents the stormwater best management practice (BMP) source control requirements for site uses and characteristics that have the potential to generate higher levels of pollutants than typical stormwater runoff.

Some site characteristics/uses may generate specific pollutants of concern or levels of pollution that are not addressed solely through implementation of the pollution reduction measures identified in **Chapter 4**. The site characteristics/uses in this chapter have been identified as potential sources of chronic loadings or acute releases of pollutants such as oil and grease, toxic hydrocarbons, heavy metals, toxic compounds, solvents, abnormal pH levels, nutrients, organics, bacteria, chemicals, and suspended solids. This chapter presents controls for managing these pollutants at their source.

6.1 Introduction and Applicability

Source control requirements apply to all developments with high-risk characteristics as defined in **Section 6.1.1** including new development, redevelopment, tenant improvements, or those existing sites proposing new offsite discharges.

Source controls shall be applied to the areas of the site with high-risk characteristics as well as any areas hydraulically connected to a high-risk area. With redevelopment projects, only areas that are being disturbed with the redevelopment are required to make structural source control changes.

6.1.1 Source Control Triggers

Projects with the following site uses/characteristics are considered to be high-risk and are subject to source control requirements. Refer to the applicable section of this chapter and follow the requirements to design source controls for the proposed site use.

- Fuel Dispensing Facilities and Surrounding Traffic Areas (**Section 6.3**)
- Above-Ground Storage of Liquid Materials (**Section 6.4**)
- Solid Waste Storage Areas, Containers, and Trash Compactors (**Section 6.5**)
- Exterior Storage of Bulk Materials (**Section 6.6**)
- Material Transfer Areas/Loading Docks (**Section 6.7**)
- Equipment and/or Vehicle Washing Facilities (**Section 6.8**)
- Stormwater and Groundwater Management for Development on Land With Suspected or Known Contamination (**Section 6.9**)
- Covered Vehicle Parking Areas for Industrial or Commercial Uses (**Section 6.10**)
- Industrial and Commercial High Traffic Areas (**Section 6.11**)
- Land Uses Subject to Oregon Department of Environmental Quality (ODEQ) 1200-Z Industrial Stormwater Permit Requirements (**Section 6.12**)

Applicants are required to address all high-risk site characteristics listed above. For example, if a development includes both a fuel dispensing area and a vehicle washing facility, the source controls in both **Sections 6.3 and 6.8** will apply.

The requirements of this chapter are in addition to the applicable requirements as identified in other chapters of these standards. Developments that have existing or proposed offsite stormwater BMP facilities are not exempt from the source control requirements of this section.

6.1.2 Goals and Objectives for Source Control

The specific source control requirements are based on the following goals and objectives:

A. Prevent stormwater pollution by eliminating pathways that may introduce pollutants into stormwater.

B. Protect soil, groundwater, and surface water by capturing pollutants and reducing impacts to the environment.

C. Issue permits for the wastewater discharges and areas with the potential for relatively consistent wastewater discharges (such as vehicle washing facilities) to the sanitary sewer system, excluding non-contaminated stormwater runoff.

D. Direct areas that have the potential for pollutant releases or accidental spills, and are not expected to regularly receive flow or require water use (such as covered fuel islands or covered containment areas) to an approved method of containment or disposal.

E. Safely contain spills onsite, avoiding preventable discharges to any storm sewers, sanitary and/or drainageways.

F. Emphasize structural BMP controls over operational procedures. Structural BMP controls are not operator-dependent and are considered to provide more permanent and reliable source control. Any proposals for operation-based source controls need to describe the long-term viability of the maintenance program.

6.1.3 Request for Alternative Method of Source Control

Applicants may request an alternative method of source control as part of the regular modification request process outlined in **Chapter 1**, though such a request may delay issuance of related site development, building and/or plumbing permits. Alternative methods of source control must be reviewed and approved by the City during the planning process.

6.1.4 Other Applicable Codes or Regulations

Some facilities may be required to obtain a National Pollutant Discharge Elimination System (NPDES) Industrial Stormwater General Permit 1200-Z issued by ODEQ before discharging to the City's storm sewer system or to waters of the state. The 1200-Z permit includes discharge benchmarks for facilities with industrial activities that are exposed to rainfall and stormwater runoff. The state also has water quality standards listed in Oregon Administrative Rules 340 Division 041 for discharges to surface waters.

Applicants may be required to obtain an Industrial Wastewater Discharge Permit from the wastewater service provider for discharges to the sanitary sewer system. Facilities subject to these requirements are generally commercial or industrial. Typical discharges include process wastewater, cooling water, or other discharges generated by some of the sources in this section that drain to a storm or sanitary sewer system.

Conformance with the requirements of this section does not relieve the applicant of other applicable local, state, or federal codes or regulations. Other applicable regulations may include the hazardous substances storage requirements of articles 79 and 80 of the Oregon State Fire Code; the Spill Prevention, Countermeasure, and Containment (SPCC) regulations of the U.S. Environmental Protection Agency's (USEPA) 40 Code of Federal Regulations (CFR)112; the Resource Conservation and Recovery Act (RCRA); Willamette Basin total maximum daily load programs regulated by the ODEQ; or any other applicable local, state, or federal regulations or permit requirements.

In the event of a conflict, the most stringent local, state, or federal regulations generally apply.

6.2 Requirements for All Sites

The following requirements apply to all sites subject to source control.

6.2.1 Signage Requirements

Informational signage is required for some site uses and activities that have the potential to contaminate stormwater. Proper signage addresses good housekeeping rules and provides emergency response measures in case of an accidental spill.

All signage shall conform to the following requirements:

A. Signs shall be located and plainly visible from all activity areas.

B. More than one sign may be needed to accommodate larger activity areas.

C. Signs shall be water and weather resistant.

D. Signs shall include the following information:
   - Safety precautions
   - Immediate spill response procedures
     (for example: "Turn the valve located at..." or "Use absorbent materials")
   - Emergency contact(s) and telephone number(s)

E. Signs may need to be in more than one language if required to communicate effectively with employees and delivery personnel.

F. Signs may need to meet retro-reflectivity standards dependent on the use and intent of the sign.

G. All signage shall comply with pertinent OCMC requirements.

Additional signage requirements for specific activities are noted in applicable sections.

6.2.2 Spill Control

Spill response supplies, such as absorbent material, containment booms, and protective clothing, shall be available at all potential spill areas. Any applicable spill response supplies need to be clearly marked and located where the signage is posted and near the high-risk activity area. The spill response supplies should be appropriate to the nature of the potential risk present at the site. More than one spill response kit may be necessary to accommodate larger activity areas.

Employees should be familiar with the site's operations and maintenance (O&M) plan; SPCC plan; and/or proper spill cleanup procedures.

6.2.3 Public Sanitary Sewer Discharge Permit

Connection/discharge to the public sanitary sewer system requires prior written approval by the City. A request to discharge to the public sanitary system shall be submitted as part of the permitting process.

6.2.4 Source Control Submittal

Applicants shall show the locations of proposed structural source controls (including spill control manholes and shutoff valves) and include documentation of high-risk site uses and the applicable source controls as part of the Stormwater Management Plan Submittal (**Chapter 9**).

6.3 Fuel Dispensing Facilities and Surrounding Traffic Areas

The requirements in this section apply to all development where vehicles, equipment, or fuel tanks are refueled on the premises, whether a large-sized gas station, a single-pump maintenance yard, or a small-sized fuel tank. A fuel dispensing facility is defined as the area where fuel is transferred from bulk storage tanks to vehicles, equipment, and/or mobile containers (including fuel islands, above- or below-ground fuel tanks, fuel pumps, and the surrounding pad). Propane tanks are exempt from the requirements of this section.

Existing fueling areas are not required to install source controls identified in this section if the scope of work is limited to the following:

- A new canopy installation over an existing fuel pad that is not being upgraded.
- An underground tank replacement for compliance with state regulations.
- The replacement of a fuel pump on an existing fuel pad that is not being upgraded.

6.3.1 Discharge Permit

The applicant shall apply and obtain a permit from the City for any discharge or point of connection to the public stormwater system. Discharges of hydrocarbons are prohibited to the public sanitary and storm sewer systems. When a containment or storage device is utilized, the owner or responsible person shall contact the appropriate authority for authorization prior to opening any valve and discharging to a public sanitary or stormwater sewer system.

6.3.2 Cover

The fuel dispensing area shall be covered with a permanent canopy, roof, or awning so precipitation cannot come in contact with the fueling activity area. Rainfall shall be directed from the cover to a stormwater disposal point that meets all applicable code requirements.

- **Covers 10 feet high or less** shall have a minimum overhang of 3 feet on each side. The overhang shall be measured relative to the perimeter of the hydraulically-isolated fueling activity area it is to cover.
- **Covers higher than 10 feet** shall have a minimum overhang of 5 feet on each side. The overhang shall be measured relative to the perimeter of the hydraulically-isolated fueling activity area it is to cover.

The requirement to cover the fuel dispensing area can be appealed if the fuel dispensing area is generally used to service oversized equipment (e.g., cranes) that cannot maneuver under a roof or canopy. A request for such an exception shall be submitted as part of the land use permit application.

6.3.3 Pavement

A paved fueling pad of asphalt or concrete shall be placed under and around the fueling activity area and shall meet all applicable building code requirements. Sizing of the paved area shall be adequate to cover the activity area, including placement and number of the vehicles or pieces of equipment to be fueled by each pump. Fuel pumps shall be located a minimum of 7 feet from the edge of the fueling pad.

6.3.4 Drainage

The paved area beneath the cover shall be hydraulically isolated from the surrounding area through grading, berms, or drains. This will prevent uncontaminated stormwater from running onto the area and carrying pollutants into the stormwater system. Drainage from the hydraulically-isolated area shall be directed to an approved sanitary sewer service provider or an authorized pretreatment facility. Surrounding runoff shall be directed away from the hydraulically-isolated fueling pad to a stormwater disposal point that meets all stormwater management requirements of this manual and other applicable code requirements.

6.3.5 Signage

Signage shall be provided at the fuel dispensing area and shall be plainly visible from all fueling activity areas. Detailed signage information is located in **Section 6.2.1**.

6.3.6 Pretreatment - Oil/ water separator

An oil/water separator with coalescing plate shall be installed upstream of the spill control manhole. The purpose of the device is to treat runoff that occurs from washing down and cleaning of the fueling area and to prevent small spills from entering the public sanitary sewer system.

Coalescing plate separators shall be designed to achieve 100-parts per million (ppm) non-polar oil and grease in the effluent from the peak flow generated by the washing

activity. Testing information must be submitted by the manufacturer of the unit that supports the 100-ppm effluent standard at the calculated flow rate.

Separator details must be shown on the building plans submitted at the time of building permit application and shall match manufacturer specifications and details, including the unit flow rate, effluent water quality, and maximum process flow rate.

All separators shall be maintained per the manufacturer's specifications and City-approved maintenance plan.

6.3.7 Spill Control Manholes

A spill control manhole shall be installed on the discharge line of the fueling pad before the public sanitary sewer line tie-in. The tee section shall extend 18 inches below the outlet elevation, and 60 cubic feet of dead storage volume shall be provided below the outlet elevation for storage of oil, grease, and solids. The manhole shall be located on private property.

A shutoff valve is required prior to the connection to the public sanitary sewer system.

6.3.8 Shutoff Valves

Shutoff valves are required to protect sewer systems from spill risks that present a danger for widespread contamination, system damages, or risk to the public health. Shutoff valves shall be located on private property and downstream of the exposed area's collection system. All valves shall be installed and maintained as per manufacturer's recommendations. For more information about shutoff valves and associated valve boxes, contact the local plumbing authority.

Shutoff valves are required for any of the following situations:

A. Site or activity areas are exposed to corrosives or oxidizers that can harm conveyance system components (such as, but not limited to, battery acid).

B. Substances that do not settle or remain in one location, and are capable of being dissolved in or float on water (such as, but not limited to, oil and grease). These substances can spread rapidly into downstream conveyance and disposal systems, causing widespread impacts and difficult clean-up situations.

C. Substances that are known to infiltrate through soils and contaminate groundwater.

D. Traffic pathways that surround fueling pads are considered high-use/high-risk areas and will require a valve on the storm drainage system. Valves installed on storm drainage systems shall be installed downstream of all applicable private stormwater quality facilities to accommodate spill containment. These valves shall be left open to facilitate stormwater flows during normal conditions, and immediately closed in the event of a spill.

E. **Fueling pads require a valve downstream of the spill control manhole**. Valves installed on sanitary sewer systems shall be installed before the public sanitary sewer system tie-in. **These valves shall be kept closed**, and opened only to allow incidental drainage activities that do not pose a threat or risk to the disposal point system. The valve shall be closed **immediately** after drainage activities are completed.

6.3.9 Additional Requirements for Fuel Dispensing Facilities

Installation, alterations, or removal of above-ground fuel tanks larger than 55 gallons, and any related equipment, are subject to additional building permit requirements. For technical questions and permitting, contact the local building code authority and the City's Development Review Engineer.

6.3.10 Bulk Fuel Terminals

Bulk fuel terminals, also known as tank farms, require the following:

A. **Secondary containment** equal to 110 percent of the product's largest container or 10 percent of the total volume of product stored, whichever is larger.

B. A **separate containment area** for all valves, pumps, and coupling areas, with sub-bermed areas either in front of or inside the main containment areas. These sub-bermed areas shall have rain shields and be directed to a public sanitary sewer system with a valve to control disposal. If no public sanitary sewer is available, drainage shall be directed to a temporary holding facility for proper disposal and may require a Water Pollution Control Facility (WPCF) permit from the Water Quality Division of ODEQ.

C. An **impervious floor** within all containment areas. Floors shall be sealed to prevent spills from contaminating the groundwater.

D. **Truck loading and off-loading areas**. These areas shall follow cover, pavement, drainage, spill control, and shutoff valve requirements identified for fuel dispensing facilities.

E. **Shutoff valves** installed for the drainage of the tank yard. The valves shall be installed downstream of the drainage system of the primary containment area and kept closed. Valves installed for the drainage of the truck pad and sub-bermed containment areas shall be installed on the sanitary waste line downstream of the spill control manhole.

F. Approval from the appropriate authority is required before draining a containment area. The facility's O&M plan should clearly define which agencies should be contacted for approval in the event of a containment issue arising. This approval will determine appropriate disposal methods, identify pretreatment requirements (if applicable), and approval of the discharge. Pretreatment may be required for oil and grease removal, and testing may be required to establish the specific characteristics of the discharge.

G. Underground fuel tanks less than 4,000 gallons in size are subject to additional permitting requirements by ODEQ. Tanks larger than 4,000 gallons are referred to the USEPA. For technical questions and permitting, call ODEQ's Northwest Region Portland office and ask for the underground storage tank permitting department.

6.4 Above-Ground Storage of Liquid Materials

The requirements in this section apply to all development where there is any exterior storage of liquid chemicals, food products, waste oils, solvents, process wastewaters, or petroleum products in above-ground containers, in quantities of 50 gallons or more. This includes both perma-

nent storage and temporary storage areas. Underground storage tanks or installations requiring a WPCF permit are exempt from these **Section 6.4** requirements, but must go through ODEQ's WPCF permit process. Sites with underground storage tanks may still be subject to the material transfer area requirements in **Section 6.7**.

6.4.1 Containment

Liquid materials shall be stored and contained in such a manner that if the container is ruptured, the contents will not discharge, flow, or be washed into a receiving system. A containment device and/or structure for accidental spills shall have enough capacity to capture a minimum of 110 percent of the product's largest container, or 10 percent of the total volume of product stored, whichever is larger.

Double-walled containers are generally exempt from these spill containment requirements.

Quantity thresholds of products that are generally exempt from these spill containment measures are as follows:

- Janitorial and cleaning supplies of less than 100 pounds net weight or 15 gallons net volume. These supplies shall be packaged for consumer use in containers of five gallons or less or have a net weight of less than 30 pounds per container. This does not include cleaners or solvents used for cleaning machinery or motor vehicle and machine parts.
- Office and stationery supplies less than 100 pounds net weight. These supplies shall be packaged for consumer use in containers less than 5 gallons in size or 30 pounds in weight.

6.4.2 Cover

Storage containers (other than tanks) shall be completely covered so rainfall cannot come in contact with them. Runoff shall be directed from the cover to a stormwater disposal point that meets all applicable code requirements.

- **Covers 10 feet high or less** shall have a minimum overhang of 3 feet on each side. The overhang shall be measured relative to the perimeter of the hydraulically-isolated activity area.
- **Covers higher than 10 feet** shall have a minimum overhang of 5 feet on each side. The overhang shall be measured relative to the perimeter of the hydraulically-isolated activity area.

6.4.3 Pavement

A paved storage area is required unless otherwise approved by the City. The storage area shall be paved with asphalt or concrete and shall meet all applicable building code requirements. Sizing of the paved areas shall be adequate to cover the area intended for storage.

6.4.4 Drainage

All paved storage areas shall be hydraulically isolated through grading, berms, or drains to prevent stormwater runoff from flowing into a storage area.

Water will accumulate in uncovered storage areas during and after rain. **Any contaminated water cannot simply be drained from the area.** It must be collected, inspected, and possibly tested at the expense of the property owner before proper disposal can be determined and authorized. Frequent draining may be required during the wet season, which may prove costly. Some type of monitoring may also be needed to determine the characteristics and level of contamination of the stormwater.

All discharges to the sanitary sewer shall be, at a minimum, considered batch discharges and shall require written approval from the appropriate authority and pretreatment prior to discharge. In some cases, an industrial discharge permit may be required. Pretreatment requirements shall be set as part of the discharge approval process, based on the types and quantities of material to be discharged. A discharge evaluation shall be performed before connection to a sanitary sewer or storm sewer. Testing may be required to establish characteristics of the wastewater or contaminated stormwater and to verify that local discharge limits are not exceeded. The facility's O&M plan should clearly define which agencies should be contacted for approval of discharging into any sanitary system.

Significant amounts of precipitation are not expected to accumulate in covered storage areas, and drainage facilities ***are not required*** for the contained area beneath the cover. If the applicant elects to install drainage facilities, the drainage from the hydraulically-isolated area shall be directed to an approved sanitary sewer or authorized pretreatment facility.

6.4.5 Shutoff Valves

A shutoff valve shall be installed in the storage area so excess stormwater can be drained out of the activity area and directed either to the storm drainage facilities (if clean) or into the public sanitary sewer or authorized pretreatment facility (if contaminated). Except when excess stormwater is being discharged, **the valve shall be kept closed at all times** so any spills within the activity area can be contained effectively.

A shutoff valve may be required for a covered storage area if the applicant elects to install drainage facilities to an approved public sanitary sewer connection. The appropriate authority will make this determination based on the type of material stored and the proposed system receiving the discharge.

6.4.6 Signage

Signage shall be provided at the liquid storage area and shall be plainly visible from all surrounding activity areas. Detailed information is located in **Section 6.2.1**.

6.4.7 Additional Requirements

Storage of reactive, ignitable, or flammable liquids shall comply with local, state, and federal fire codes, as applicable. Source controls presented in this section are intended to complement, not conflict with, current fire code requirements.

6.5 Solid Waste Storage Areas, Containers, and Trash Compactors

The requirements in this section apply to all commercial and industrial development with facilities that store solid wastes (both food and non-food). A solid waste storage area is a place where solid waste containers are collectively stored. Solid waste containers include compactors, barrels, dumpsters, and garbage cans. Requirements of this section also apply to activity areas used to collect and store refuse or recyclable materials, such as can or bottle return stations, grease containers, and debris collection areas.

This section applies to multi-family residential sites of three or more units if a shared trash collection area is proposed. However, the requirements of this section do not apply to single-family homes or debris collection areas used for the temporary storage of wood pallets or cardboard.

Refer to OCMC 8.2 for additional requirements related to dumpsters and solid waste storage areas.

6.5.1 Cover

A permanent canopy, roof, or awning may be required to cover the solid waste storage activity area. When a permanent cover is required, it shall be constructed to cover the activity area so rainfall cannot come in contact with the waste materials being stored. The cover shall be sized relative to the perimeter of the hydraulically-isolated activity area it is to cover. Runoff shall be directed from the cover to a stormwater disposal point that meets all applicable code requirements.

Compactors are exempt from the cover requirement.

6.5.2 Pavement

A paved waste storage area is required when a structural cover or trash compactor is used. The area shall be paved with asphalt or concrete and meet all applicable building code requirements. Sizing of the paved area shall adequately cover the activity area intended for refuse storage, or the trash compactors and associated equipment.

6.5.3 Isolation

Hydraulic isolation shall be provided for the solid waste storage activity area and shall be designed to prevent uncontaminated stormwater runoff from entering the area and carrying pollutants away. Runoff occurring outside the hydraulically-isolated area shall be directed to a stormwater disposal point that meets all applicable code requirements. This can be achieved by reverse grading at the perimeter of an activity area, perimeter curbing or berming, or the use of area drains to collect and divert runoff.

6.5.4 Signage

Signage shall be provided at the solid waste storage area and shall be plainly visible from all surrounding activity areas. Detailed information is located in **Section 6.2.1**.

6.5.5 Drainage

Drainage shall be provided for the hydraulically-isolated solid waste storage area and directed to an approved public *sanitary sewer* or authorized pretreatment facility. A sani-

tary sewer drain is required for those areas that may be subject to refuse or suspected pollutants that pose a risk if the structural integrity of the trash receptacle is damaged or if its contents are exposed to rainfall.

Non-gravity option. Multi-family solid waste storage areas that do not have gravity sanitary sewer service may be allowed to direct the drainage from the hydraulically-isolated area to the development's stormwater management facility.

Commercial and industrial solid waste storage areas that do not have gravity sanitary sewer service may be allowed to install a pressurized system. With these types of installations, the following items shall be provided at the time of building permit application:

- Verification or evidence that gravity service cannot be obtained.
- Details of an electronic sump pump system equipped with a float switch.
- City approval.

Pressurized system installations are considered to be permanent equipment and deemed the property owner's liability in the event of system failure or if the property becomes vacated.

The local building codes authority will review all sump pump or sewage ejector installations for compliance with local and state plumbing codes. The City Engineer will review for compliance with City standards.

6.6 Exterior Storage of Bulk Materials

The requirements of this section apply to developments that stockpile or store materials in outdoor containers that may erode or have negative stormwater impacts. The materials are separated into three categories, based on risk assessments for each material stored: high-risk, low-risk, and exempt. These include, but are not limited to, the materials listed in **Table 6-1**.

Table 6-1. Material Risk Categories

High-Risk	Low-Risk	Exempt
• Recycling materials with potential effluent • Corrosive materials (e.g., lead-acid batteries) • Storage and processing of food items • Chalk/gypsum products • Feedstock/grain • Material by-products with potential effluent • Fertilizer • Pesticides • Lime/lye/soda ash • Animal/human wastes	• Recycling materials without potential effluent • Scrap or salvage goods • Metal • Sawdust/bark chips • Sand/dirt/soil (including contaminated soil piles) • Material by-products without potential effluent • Unwashed gravel/rock • Compost • Asphalt	• Washed gravel/rock • Finished lumber • Rubber and plastic products (hoses, gaskets, pipe, etc.) • Clean concrete products (blocks, pipe, etc.) • Glass products (new, non-recycled) • Inert products

Materials with any of the following characteristics are exempt from the requirements of this section:

- Have no measurable solubility or mobility in water and no hazardous, toxic, or flammable properties.
- Exist in a gaseous form at ambient temperature.
- Are contained in a manner that prevents contact with stormwater (excluding pesticides and fertilizers).

6.6.1 Cover

A. Low-risk materials shall be covered with a temporary plastic film or sheeting at a minimum.

B. High-risk materials shall be covered permanently with a canopy or roof to prevent stormwater contact and minimize the quantity of rainfall entering the storage area. Runoff shall be directed from the cover to an approved stormwater disposal point that meets all applicable code requirements.

C. Covers 10 feet high or less shall have a minimum overhang of 3 feet on each side. The overhang shall be measured relative to the perimeter of the hydraulically-isolated activity area.

D. Covers higher than 10 feet shall have a minimum overhang of 5 feet on each side. The overhang shall be measured relative to the perimeter of the hydraulically-isolated activity area.

6.6.2 Pavement

A. Low-risk material storage areas are not required to be paved.

B. High-risk material storage areas shall be paved beneath the structural cover. Sizing of the paved area shall adequately cover the activity area intended for storage.

6.6.3 Drainage

A. Low-risk material storage areas are typically allowed in areas served by standard stormwater management systems. However, all erodible materials being stored must be protected from rainfall.

B. If materials are erodible, a structural containment barrier shall be placed on at least three sides of every stockpile. The barrier shall be tall enough to prevent runon of uncontaminated stormwater into the storage area and migration of the stored materials as a result of being blown or washed away. If the area under the stockpile is paved, the barrier can be constructed of asphalt berms, concrete curbing, or retaining walls. If the area under the stockpile is unpaved, sunken retaining walls or ecology blocks can be used. The applicant shall clearly identify the method of containment on the building plans.

C. For high-risk material storage areas, the paved area beneath the structural cover shall be hydraulically isolated through grading, structural containment berms or walls, or perimeter drains to prevent uncontaminated stormwater from running onto the area and carrying pollutants away. If significant amounts of precipitation are

not expected to accumulate in covered storage areas, drainage facilities are not required for the contained area beneath the cover. If the applicant elects to install drainage facilities, the drainage from the hydraulically-isolated area shall be directed to an approved public sanitary sewer or authorized pretreatment facility. In such a case, an evaluation will be done to determine if an NPDES discharge permit is required.

6.6.4 Signage

Signage shall be provided at the storage area if hazardous materials or other materials of concern are stored. Signage shall be located so it is plainly visible from all storage activity areas. More than one sign may be needed to accommodate large storage areas. Detailed information and examples are provided in **Section 6.2.1**.

6.6.5 Shutoff Valves

A shutoff valve may be required for the structurally covered storage area if the applicant elects to install drainage facilities to an approved public sanitary sewer. The City will make this determination based on the type of material stored and the proposed system receiving the discharge.

6.6.6 Monitoring and Sampling

A sampling manhole or other suitable stormwater monitoring access point may be required to monitor stormwater runoff from the storage area. This may apply to certain types of storage activities and materials or if an alternative source control is proposed. The City will review the applicability of this requirement.

6.6.7 Additional Requirements

Storage of pesticides and fertilizers may need to comply with specific regulations outlined by ODEQ. For answers to technical questions, call ODEQ's Northwest Region Portland office.

6.7 Material Transfer Areas/Loading Docks

The requirements in this section apply to all developments that propose the installation of new material transfer areas, or structural alterations to existing material transfer areas (e.g., access ramp regrading, leveler installations).

The requirements apply to all material transfer areas, including loading/unloading docks, bay doors, and any other building access points with the following characteristics:

- The area is designed (size, width, etc.) to accommodate a truck or trailer being backed up to or into it, and
- The area is expected to be used specifically to receive or distribute materials to and from trucks or trailers.

The requirements may not apply to areas that are used only for small- to mid-sized passenger vehicles and that are restricted (by lease agreements or other regulatory requirements) to storing, transporting, or using materials that are classified as domestic use. Examples of domestic

uses include primary educational facilities (elementary, middle, or high schools), buildings used for temporary storage (a lease agreement will need to be provided), and churches. Contact the City for help in determining whether requirements apply.

6.7.1 Pavement

A paved material transfer area of asphalt or concrete shall be placed underneath and around the loading and unloading activity area and shall meet all applicable building code requirements. This will reduce the potential for soil contamination with potential impacts on groundwater, and will help control any acute or chronic release of materials present in these areas.

6.7.2 Isolation

For loading docks, the first 3 feet of the paved area, measured from the building or dock face, shall be hydraulically isolated through grading, berms, or drains to prevent uncontaminated stormwater from running onto the area and carrying pollutants away.

Bay doors and other interior transfer areas shall be designed so that stormwater runoff does not enter the building. This can be accomplished by grading or drains.

6.7.3 Drainage

Drainage from the hydraulically-isolated loading dock areas shall be directed to an approved public sanitary sewer or authorized pretreatment facility. Surrounding runoff and drainage from the access ramp shall be directed away from the hydraulically-isolated area to the appropriate stormwater management facility.

Non-Gravity Option. Activity areas that cannot achieve gravity sanitary sewer service may be allowed to install a pressurized system. With these types of installations, the following items shall be provided at the time of building permit application:

- Verification or evidence that gravity service cannot be obtained.
- Details of an electronic sump pump system equipped with a float switch.
- City approval.

Pressurized system installations are considered to be permanent equipment and deemed the property owner's liability in the event of system failure or if the property becomes vacated.

The local building codes authority will review all sump pump or sewage ejector installations for compliance with local and state plumbing codes. The City Engineer will review for compliance with City standards.

Bay Doors and Other Interior Transfer Areas. Because interior material transfer areas are not expected to accumulate precipitation, installation of floor drains is not required or recommended. It is preferable to handle these areas with a dry mop or absorbent material. If interior floor drains are installed, they shall be plumbed to an approved public sanitary sewer or authorized pretreatment facility.

6.7.4 Signage

Signage shall be provided at the material transfer area and shall be plainly visible from all surrounding activity areas. Detailed information is located in **Section 6.2.1**.

6.7.5 Shutoff Valves

Shutoff valves are required to protect the public sanitary sewer and drainageway systems from spills of chemicals and other constituents that may provide a danger of widespread contamination, system damage, or risk to public health.

Shutoff valves are required for any of the following situations:

- Site activity areas that are exposed to corrosives or oxidizers that can harm conveyance system components (such as battery acid).
- Transfer of substances (such as oil and grease) that do not settle or remain in one location, and are capable of being dissolved in or float on top of water. These substances can spread rapidly into downstream systems, causing widespread impacts and difficult clean-up situations.
- Transfer of substances that are known to infiltrate through soils and contaminate groundwater.

Valves located in material transfer areas are typically left open to facilitate drainage during normal conditions, and immediately closed in the event of a spill.

Prior to transfer activities of harmful substances, the valves shall be closed and reopened only after the transfer is complete. The shutoff valves must be located on private property and downstream of the exposed area's collection system.

All valves shall be installed and maintained in accordance with manufacturer's specifications. For more information about shutoff valves and associated valve boxes, contact the local building codes authority.

6.7.6 Additional Requirements

Bay doors and other interior transfer areas shall provide a 10-foot no obstruction zone beyond the entrance within the building. This will allow the transfer of materials to occur with the truck or trailer end placed at least 5 feet inside the building, with an additional staging area of 5 feet beyond that. The no obstruction zone shall be clearly identified on the stormwater management plan at the time of the building permit application, and shall be painted at the facility with bright or fluorescent floor paint.

6.8 Equipment and/or Vehicle Washing Facilities

The requirements in this section apply to all development with a designated equipment and/or vehicle washing or steam cleaning area. This includes smaller activity areas, such as wheel-washing stations. **Single Family Residential sites are exempt.**

6.8.1 Cover

The washing area shall be covered with a permanent canopy or roof so precipitation cannot come in contact with the washing activity area. Precipitation shall be directed

from the cover to a stormwater disposal point that meets all applicable code requirements.

- **Covers 10 feet high or less** shall have a minimum overhang of 3 feet on each side. The overhang shall be measured relative to the perimeter of the hydraulically-isolated washing activity area it is to cover.
- **Covers higher than 10 feet** shall have a minimum overhang of 5 feet on each side. The overhang shall be measured relative to the perimeter of the hydraulically-isolated washing activity area it is to cover.

6.8.2 Pavement

A paved wash pad of asphalt or concrete shall be placed under and around the washing activity area and shall meet all applicable building code requirements. The paved area shall be sized to cover the activity area adequately, including the placement of the vehicle or piece of equipment to be cleaned.

6.8.3 Signage

Signage shall be provided at the washing area and shall be plainly visible from all surrounding activity areas. Detailed information is located in **Section 6.2.1**.

6.8.4 Drainage

The paved area beneath the cover shall be hydraulically isolated through grading, berms, or drains to prevent uncontaminated stormwater from running onto the area and carrying pollutants away. Drainage from the hydraulically-isolated area shall be directed to an approved public sanitary sewer or authorized pretreatment facility. If connected to the public sanitary sewer, and, depending on the washing compounds used (i.e., brighteners), an industrial discharge permit to the public sanitary sewer system may be required. For further questions, contact the City.

Surrounding runoff shall be directed away from the hydraulically-isolated washing pad to a stormwater disposal point that meets all applicable requirements of this manual.

6.8.5 Oil Controls

All vehicle and equipment washing activities will be equipped with an approved oil/water separator system unless otherwise authorized by the City. The system shall comply with the public sanitary sewer discharge limits. The following design criteria are established for oil/water separators discharging to a public sanitary sewer system. For discharge requirements and limitations to the public sanitary sewer system, contact the City.

Onsite wash recycling systems may be used for oil control as long as they can meet effluent discharge limits for the public sanitary sewer system. A detail of the wash recycling system and vendor specifications identifying effluent efficiencies shall be submitted as part of the building plans at the time of stormwater management plan/building permit application.

Washing areas protected with a cover or located inside a structure shall have an oil/water separator that meets the following requirements:

A. Baffled oil/water separators and spill control separators shall not be allowed for use with equipment and/or vehicle washing applications. Activities and processes of a washing facility change over time, and the introduction of heat and surfactants may occur.

B. Coalescing plate separators shall be designed to achieve 100-ppm non-polar oil and grease in the effluent from the peak flow generated by the washing activity. Testing information must be submitted by the manufacturer of the unit that supports the 100-ppm effluent standard at the calculated flow rate.

C. Any pumping devices shall be installed downstream of the separator to prevent oil emulsification.

D. Separator details must be shown on the building plans submitted at the time of building permit application and shall match manufacturer specifications and details, including the unit flow rate, effluent water quality, and maximum process flow rate.

E. All separators shall be maintained per the manufacturer's specifications and City-approved maintenance plan.

6.9 Land with Suspected or Known Contamination

The requirements in this section apply to all development projects that disturb property at risk, suspected, or known to contain pollutants in the soil or groundwater. This includes development that is surrounded by properties found to have trace pollutants. These requirements will be applied to any property that is seeking to make a new connection to a public storm system from a property that is at risk, suspected, or known to contain pollutants in the soil or groundwater. To avoid confusion with references to water quality pollutants throughout this manual, this section refers to pollutants as **contaminants and/or contamination**.

Because of local, state, and federal regulations, special handling and management of site soils, groundwater, and surface drainage may be necessary. As a result of these regulations, sites with suspected or known contamination require a more detailed review process and may delay issuance of related stormwater management plans and building permit approvals. Applicants are advised to contact the City early on in the design process (before plan submittal) if they are aware or suspect the site has contaminants or is adjacent to a contaminated site.

6.9.1 Identifying Contaminated Sites

To research contaminant information, refer to ODEQ's Environmental Cleanup Site Information online database: http://www.deq.state.or.us/lq/ecsi/ecsi.htm

If records indicate there is a potential of contamination on the site, the applicant must contact ODEQ prior to pre- and post-construction activities to ensure conditions of record are not violated. For technical questions related to site contamination and clean-up, contact the Land Quality Division of ODEQ and/or ODEQ's Northwest Region Portland Office.

If a Phase 1 ODEQ Site Assessment is required, the report shall be submitted to the City for review.

If contamination is discovered subsequent to stormwater management plan approval, the owner shall take steps immediately to protect health and safety and contact the City and ODEQ. Plan approval is suspended until the contamination is resolved.

6.9.2 Review Process

Stormwater discharges from sites suspected of contamination, whether proposed as a temporary construction connection or as permanent connection to any public storm or sanitary sewer system, will require a special authorization from the City. Contaminants, media, and site conditions are unique to each parcel of land. Sites at risk for contamination shall therefore be reviewed on a case-by-case basis.

After reviewing the proposal and a characterization of the contaminants from the site, the City may make one of the following decisions:

- **Approve discharges to the public storm and/or sanitary sewer system with restrictions** such as those described herein or as is necessary given the nature of the discharge.
- **Require the applicant to obtain an NPDES permit** from ODEQ for the anticipated discharge prior to connection to a public system.
- **Require that the applicant become part of the Industrial Pre-Treatment Program** operated by the applicable wastewater agency.
- **Deny the request to discharge** to the public storm and/or sanitary sewer system.
- **Allow unrestricted connection** to the public storm and/or sanitary sewer system, with a testing point for future monitoring.

6.9.3 Soil Management

Stockpiles of contaminated soils shall be covered with temporary plastic film or sheeting to prevent stormwater from coming into contact with them.

Stockpile perimeters shall have a containment barrier on all four sides of every stockpile to prevent stormwater runon and material runoff. Barriers can consist of concrete curbing, silt fencing, or other berming material, depending on the activity, size, and resources available.

Areas under stockpiles of contaminated soils are not required to be paved. However, an impervious layer shall be placed beneath the stockpile to protect uncontaminated areas from potential leachate.

6.9.4 Construction Dewatering

All construction dewatering discharges resulting from groundwater or precipitation (rainfall) will be evaluated for contamination before disposal methods can be approved.

Source controls, sampling points (if required), and the disposal point shall be identified on the erosion prevention and sediment control plan (see **Chapter 7**). Source control requirements will be identified as part of the review process of the laboratory analysis reports and the proposed stormwater management plan. Based on the intended method of disposal the following requirements apply:

- **If onsite infiltration is the proposed method for disposal**, authorizations are required from the City and the Land Quality Division of ODEQ. Private infiltration systems for construction dewatering shall be located and maintained on private prop-property, outside the public rights-of-way (ROWs).
- **If a public sanitary system is the proposed method of disposal**, authorizations are required from the appropriate authorities, and will be allowed only if extensive pretreatment is implemented and the discharge is approved by the appropriate authorities. All groundwater and surface water discharges to a sanitary sewer system shall meet local discharge limits and will be subject to discharge volume charges.
- **If a public stormwater system is the proposed method of disposal**, evaluations of discharge to the public storm system will be based on whether discharges meet, or can be pretreated to meet, requirements of the City, NPDES discharge permit or other state and federal regulations for the receiving surface water.
- **If a receiving stream is the proposed method for disposal**, authorizations are required from the City and Land Quality and Water Quality Divisions of ODEQ.

6.9.5 Post-Construction Drainage Systems

All discharges from sites with suspected or known contamination shall identify an appropriate stormwater disposal location and obtain discharge permits from the appropriate agencies.

If **onsite infiltration** is the proposed method for disposal, authorizations are required from the City and ODEQ. Private infiltration systems shall be located and maintained on private property, outside the public ROWs.

If **a drainageway** is the proposed method for disposal, authorizations are required from the City, the U.S. Army Corp of Engineers, and ODEQ.

If **an offsite public storm or sanitary sewer system** is the proposed method for disposal, authorization or industrial discharge permitting may be required from the City. A permanent monitoring point may be required to ensure compliance with local discharge regulations. If monitoring is necessary, a permanent structure (such as a sampling manhole or flow-through vault) shall be installed on the discharge line of the subsurface drainage system.

6.10 Covered Vehicle Parking Areas for Commercial or Industrial Uses

The requirements in this section apply to commercial or industrial development with a covered vehicle parking area. Existing parking structures are not required to be retrofitted unless the structure is being redeveloped.

Single-level covers (canopies, overhangs, and carports) are exempt from the requirements of this section, but may be subject to the requirements of **Section 6.11** if they are located in high traffic areas.

6.10.1 Drainage

Stormwater runoff from the top floor of a multi-level parking structure shall be directed to a stormwater disposal point that meets all water quality requirements of these standards and any other applicable code requirements.

Significant amounts of precipitation are not expected to accumulate in the lower floors of multi-level parking structures, so drainage facilities ***are not required*** for the lower floors. If the applicant elects to install drainage facilities, the drainage from the lower floors shall be directed to an approved public sanitary sewer system. Prior to discharge all applicable pretreatment requirements shall be met.

The adjacent uncovered portions of the site shall be designed so that stormwater does not enter the covered parking areas. This can be accomplished through grading or drains.

6.11 Industrial and Commercial High Traffic Areas

The requirements in this section apply to all new development with vehicle parking areas for developments zoned industrial or commercial with high-traffic volumes. High-traffic volumes are defined as an average daily traffic (ADT) of 2,500 vehicles, consistent with ODEQ's Industrial Stormwater Best Management Practices Manual (February 2013).

Industrial and commercial high-traffic areas with a drainage area of over 10,000 SF directed to a single stormwater management facility shall have an adequate oil control facility located up-stream of the stormwater management facility. Parking areas of over 10,000 SF that are divided into drainage areas of less than 10,000 SF do not require this pretreatment.

6.11.1 Oil Controls

An oil/water separator with coalescing plate shall be installed upstream of the storm-water management facility. The purpose of the device is to treat and prevent hydrocar-bons from entering the stormwater BMP facility. This device shall be maintained per the manufacturer's specification and the approved maintenance plan.

Coalescing plate separators shall be designed to achieve 100-ppm non-polar oil and grease in the effluent from the peak flow generated by the expected site activity. Test-ing information must be submitted by the manufacturer of the unit that supports the 100-ppm effluent standard at the calculated flow rate.

Flow rates will be determined by the drainage area served by the device. The device will be sized to treat the water quality storm event as specified in **Chapter 4**.

Separator details must be shown on the building plans submitted at the time of building permit application and shall match manufacturer's specifications and details, including the unit flow rate, effluent water quality, and maximum process flow rate.

All separators shall be maintained per the manufacturer's specifications and the ap-proved O&M plan.

CHAPTER 7

Erosion Prevention and Sediment Control

CHAPTER 7. EROSION PREVENTION AND SEDIMENT CONTROL

When land is disturbed, the erosion rate accelerates dramatically. Since ground cover on an undisturbed site protects the surface, removal of that cover increases the site's susceptibility to erosion. The major problem associated with erosion is the movement of soil off the site and its impact on water quality. This chapter outlines the requirements for erosion prevention, sediment control, and construction debris management.

7.1 Introduction

Sediment in streams is a contributing factor in the decline of salmonid populations in our region. Many agencies, including the Oregon Department of Environmental Quality (ODEQ), National Marine Fisheries Service (NMFS), and Oregon Department of Fish and Wildlife (ODFW) require proper erosion controls to protect natural systems. In addition, sediment leaving the site may damage neighboring properties, block drainage systems, and enter roadways. Proper planning and use of erosion prevention measures can reduce these impacts.

Erosion prevention measures are more effective than the reactive control of sediment. Identifying erosion problems at the planning stage and noting highly erodible areas helps in selecting cost effective, environmentally sensitive erosion control measures. Once soil particles become dislodged, it requires greater efforts and costs to contain the sediment on the site.

It is the City's goal to comply with all conditions of the various state and federal regulations and requirements that pertain to erosion and water quality protection. As required by water quality standards set forth in Oregon Administrative Rules, It is the City's policy to prevent erosion and use sediment controls to minimize the amount of sediment and other pollutants that reach the public storm and/or surface water system resulting from development, construction, grading, filling, excavating, clearing, and any other activity which accelerates erosion.

For erosion prevention design specifications and standards, the City has partnered with other regional jurisdictions to develop a manual for erosion prevention and sediment control. The City has adopted that manual as the **City of Oregon City Public Works Erosion and Sediment Control Standards (Erosion Standards)**. The requirements of this chapter are consistent with and should be used in conjunction with the **Erosion Standards.** The **Erosion Standards** and other associated documents and forms can be obtained from the City.

7.2 General Provisions

A. The owner of the property and/or permittee under an approved development activity shall be held responsible for any violation of these standards.

B. Visible or measurable erosion from a project site which enters, or is likely to enter, the public or private storm and surface water system or other properties, is prohibited, and is a violation of these standards.

C. No person shall create physical erosion by dragging, dropping, tracking, or otherwise placing or depositing, or permitting to be deposited, mud, dirt, rock or other such debris upon a public street or into any part of the public storm and surface water system, or any part of a private storm and surface water system which drains or connects to the public storm and

surface water system. Any such deposit of material shall be removed immediately using hand labor or mechanical means. No material shall be washed or flushed into any part of the storm and surface water system until all mechanical means to remove the debris have been exhausted and preventative sediment filtration is in place.

D. The City requires temporary and permanent measures for all construction projects to lessen the adverse effects of site alteration on the environment. The owner or his/her agent, contractor, or employee, shall properly install, operate, and maintain both temporary and permanent measures to protect the environment during the useful life of the project.

E. Approval of an **Erosion and Sediment Control Plan (ESCP)** plan by the permitting authority does not relieve the applicant's responsibility to ensure that ESCP measures are constructed and maintained on the construction site.

F. Nothing in this section shall relieve any person of the obligation to comply with the regulations or permits of any local, state, or federal authority.

G. These erosion prevention and sediment control rules apply to all properties within the city boundary, regardless of whether that property is involved in a construction or development activity.

7.3 Applicability

Within the boundaries of the city, any grading or soil disturbance associated with a development activity that disturbs 1,000 square feet or greater is required to obtain an erosion and sediment control (ESC) permit from the City. This requirement is consistent with Metro's Urban Growth Management Plan, Title 3 and the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit.

If any development activity that did not require an ESC permit causes a violation of these standards, the permittee or property owner shall be required to obtain an ESC permit and comply with the associated rules and regulations, including the development of an ESCP, payment of permit fees, and construction site inspection activities.

7.3.1 NPDES 1200-C Permit

In addition to obtaining an ESC permit from the City, development activity that results in 1 or more acres of disturbance is required to obtain an NPDES 1200-C permit from ODEQ and conform to ODEQ's NPDES 1200-C permit requirements. The planning process outlined in the **Erosion Standards** is intended to assist the applicant in meeting the requirements of the NPDES 1200-C permit. However, it is the responsibility of the applicant to review and comply with ODEQ's regulations and permitting process, including paying any applicable fees to reviewing agencies.

7.4 Erosion and Sediment Control Plan (ESCP)

The purpose of the ESCP is to clearly establish control measures that are intended to prevent erosion and off site sediment transport during construction.

7.4.1 General ESCP Principles

When developing an ESCP, the following are important concepts to consider:

A. **Minimize site disturbance**. Plan and locate development activities to minimize land disturbance such as clearing and grading and cut and fill to protect existing vegetation as well as reduce erosion and sediment loss.

B. **Stage construction activities**. Where applicable and appropriate, locate construction pollutant sources (including sediment) away from drainage swales, wetlands, and water bodies.

C. **Schedule work.** Schedule work to minimize overall impacts, addressing critical areas during the dry weather season when practicable. Phase construction activities to minimize the exposed soil area and the duration of exposure.

D. **Prevent erosion.** Emphasize the use of erosion prevention techniques, including proper site planning and construction phasing, ahead of sediment control measures.

E. **Minimize length and steepness of slopes.** Cut and fill slopes should be as flat as practicable and consistent with soil stability. Slopes of two-horizontal to one-vertical (2h:1v) or steeper may require special design.

F. **Control sediment transport.** Sediment removed from sediment control facilities should be placed in non-critical flat areas of the site. In no instances shall the removed sediment be placed in a position that would allow subsequent rainfall to return it to the sediment control devices.

G. **Address wet weather conditions.** Stockpile erosion prevention materials and supplies onsite during the wet weather period (October 1 through May 31). Enhance protections prior to predicted storm events.

H. **Prevent impacts from construction site wastes**. Consider and prevent exposure to stormwater runoff from construction site wastes such as discarded building material, concrete truck washout, chemicals, litter and sanitary waste.

I. **Adjust during construction.** The ESCP shall identify the minimum best management practices (BMPs) to address expected site conditions. Throughout the project duration, it is the responsibility of the applicant to identify appropriate BMPs to prevent erosion and control sediment discharges. In some cases, this will require the applicant to adjust, modify, or add additional BMPs beyond those listed in the ESPC.

J. **Maintain BMPs.** Inspect and maintain ESC BMPs throughout the construction period.

K. **Site stabilization.** Seed and mulch exposed areas as soon as possible after grading is completed. Stabilize the site following construction.

7.4.2 Approved BMPs

ESC BMPs are required for construction areas where ground surfaces will be disturbed by clearing, grading, fills, excavations, and other construction activities. The ESCP shall incorporate construction BMPs which minimize the amount of disturbed land area and avoid or minimize work on steep slopes.

The BMPs prescribed in the **Erosion Standards** are the approved BMPs that shall be used to develop the ESCP. Use of other BMPs shall require approval from the City.

7.4.3 Wet Weather Measures

On sites where vegetation and ground cover are removed, vegetative ground cover shall be planted and established by October 1 and continue to function through May 31 of the following year, or as approved by the City. If ground cover is not established by October 1, the open areas shall be protected through May 31 of the following year with straw mulch, erosion blankets, or other methods approved by the City.

7.4.4 Maintenance and Removal of BMPs

The permittee shall inspect (see **Section 7.5.3**) and maintain the facilities according to the approved ESCP during the construction phase, the post construction phase, establishment of permanent vegetation, or any other permitted activity. If the facilities and techniques approved in an ESCP are not effective or sufficient as determined by the City, the permittee shall submit a revised plan within 3 working days of written notification by the City. Upon approval of the revised plan by the City, the permittee shall implement the additional facilities and techniques included in the revised plan immediately. In cases where erosion is likely to occur, the City may require the applicant to install interim control measures prior to submittal of the revised ESCP.

Temporary BMPs, such as sediment fences, shall be removed after permanent vegetation is established.

Sediment control BMPs will accumulate sediment during the construction process. The applicant shall remove and properly dispose of accumulated sediment in accordance with the **Erosion Standards**.

7.4.5 Contaminated Soils

If the construction process reveals soils contaminated with hazardous materials or chemicals, the contractor shall stop work immediately, ensure that no contaminated material is improperly hauled from the site, and immediately notify the City, ODEQ, and other applicable agencies.

7.5 Plan Review, Permitting and Approval Processes

The City reviews and approves many types of development activities such as single-family residential, multi-family, commercial, industrial, partitions, and subdivisions. All development activity, regardless of the nature of development activity, is subject to the ESC permitting process. Activities that exceed the thresholds outlined earlier will require additional permitting requirements.

7.5.1 ESC Permitting Process

For single-family development permit applications, the applicant shall apply for the erosion control permit along with the building permit application. For non single-family development permit applications, the applicant shall apply for the ESC permit and any other public works permits, in conjunction with the land use application.

7.5.2 ESCP Submittal Requirements

The applicant shall submit an ESCP incorporating the appropriate BMPs for the anticipated site conditions.

The ESCP shall include written documentation and construction plans that show the locations of proposed minimum measures. The ESCP shall be included as part of the overall submittal of the stormwater management plan. For specific guidelines, see the **Erosion Manual**. ODEQ's NPDES 1200-C permit templates may be used for developing the ESCP.

7.5.3 Inspection Process

Inspections shall be conducted by the applicant and/or site operator according to the requirements in the **Erosion Standards**. ESC inspections include:

- Pre-construction: Initial site inspection with City representatives prior to starting any development, site ground disturbance or grading activity excluding the installation of the ESCP BMPs.
- Active Period: Daily site inspections during active construction when stormwater runoff, including snowmelt, is occurring.
- Prior to Inactivity: Inspection to ensure that ESCP measures are in working order. Any necessary repairs must be made prior to leaving the site.
- Inactive Periods (greater than 7 calendar days): Inspections once every two weeks.

During periods when the site is inaccessible due to inclement weather, inspections shall occur daily at relevant and accessible downstream discharge points to look for evidence of sediment laden water flowing from the construction site.

Routine inspections shall be conducted by the City throughout construction.

Once the project has been completed, the permittee shall request a final ESC inspection. Prior to a certificate of occupancy being issued, the City inspector must confirm that the ESC permit can be closed.

CHAPTER 8

Operation and Maintenance

CHAPTER 8. OPERATION AND MAINTENANCE

One purpose of the City of Oregon City's (City) operation and maintenance (O&M) program is to manage stormwater runoff from new development and redevelopment within the boundaries of the city and as required in the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit. The program is required to provide a mechanism to ensure long-term functionality of constructed stormwater management facilities.

8.1 Introduction

The O&M requirements in this chapter apply to all stormwater management facilities constructed as a requirement of these standards. Maintenance activities, including routine maintenance, restorative maintenance, and rehabilitation are required to ensure the long-term function and effectiveness of stormwater management facilities and infrastructure. Initial site planning must incorporate provisions for adequate access and space to perform maintenance activities for all stormwater management facilities.

8.2 General Requirements

The City is responsible for ensuring the O&M of stormwater management facilities within the city boundary. All facility designs will be held to the same standards regardless of the organization or entity that has accepted responsibility for the maintenance. There are two categories of maintenance for stormwater management facilities.

- ***Privately-owned and maintained***. These are stormwater management facilities which benefit one owner. They include residential, multi-family, commercial, and industrial types of developments. These stormwater management facilities require a maintenance covenant recorded with the title that describes the types of facilities and necessary maintenance.
- ***Publicly-owned and maintained***. These are regional and sub-regional stormwater management facilities which benefit the public in general and any facility located within the public right-of-way. These stormwater management facilities can be utilized for any type of development if shown to have sufficient capacity. Stormwater management facilities that serve multiple properties (e.g., facilities for residential subdivisions) shall be transferred to public ownership following the 2-year maintenance warranty period.

8.3 O&M Plans

All stormwater management facilities require the applicant to execute and record an O&M plan. The plan shall ensure that owners maintain and operate the stormwater management facility to preserve and continue its function. O&M plans require stormwater management facility owners to properly maintain, repair, modify or reconstruct (if necessary) the facility, and provide a schedule for the maintenance frequency for the facility.

8.3.1 O&M Plan Development

O&M plans shall be required for all permanent stormwater best management practices (BMP) facilities to ensure that they function as designed. The purpose of an O&M plan is to provide guidance to those who are responsible for the long-term inspection and maintenance of the facility.

To ensure functionality of the stormwater BMP facilities, owners are required to inspect facilities regularly per the approved O&M plan to determine maintenance needs. Routine inspection and maintenance can help to keep overall maintenance costs low by detecting problems early and avoiding large repair or replacement costs.

The facility design and maintenance specifications in **Appendix C** can be used to create the O&M plan. If the proposed facility types do not match a stormwater management facility in **Appendix C**, the applicant and design engineer will be responsible for creating any drawings, maintenance specifications, and an inspection checklist to be incorporated into the O&M plan.

O&M plans for privately owned/maintained facilities shall be recorded with the Clackamas County Clerk's office as an exhibit to the maintenance covenant referenced in **Section 8.4.1** before issuance of a building permit or final plat approval.

8.3.2 O&M Plan Elements

The following outline can be used to prepare an O&M plan.

1. Introduction and general information
    a. Facility Information. Facility type and identifying name or number, as applicable.
    b. Contact. Name and contact information for the responsible organization or individual.
    c. Narrative. Written overview describing the site, drainage areas, and intended function of the facility.
2. Operations and Maintenance
    a. Operating Procedures. Normal operating procedures for facility function, including any seasonal modifications or adjustments.
    b. Regular Maintenance. Required maintenance activities and schedule (i.e., landscape maintenance, sediment removal, pipe cleaning).
    c. Inspections. Required inspection frequency to verify facilities are being maintained and functioning as designed.
    d. Maintenance Standards. Minimum standards that are required for the stormwater management facility to produce desired results and maintenance actions when the minimum standards are not met (See **Appendix C**).
    e. Lifespan. Expected lifespan of the facility components (i.e., when should owners expect to replace growing media, plantings, and control structure elements?).
    f. Connected Facilities. List of interrelated or connected stormwater management facilities and description of how each facility works with the next one.
3. O&M Plan Responsibility
    a. Responsible Party. Identify the person(s) or organization(s) responsible for inspections of stormwater management facilities.
    b. Funding. Identify the funding source for maintenance.

4. Attachments

   a. Site Plan. Include a site plan to identify the location of the facility/facilities, sources of runoff entering each facility, and ultimate stormwater disposal point.

   b. Facility Details. Include the stormwater management facility detail sheet(s) and O&M Plan and checklist(s) (when applicable use details in **Appendix C** for reference).

   c. Maintenance Agreement or Covenant. Include a copy of the public maintenance agreement and/or private maintenance covenant that will be used to assign maintenance responsibility and/or to allow access for maintenance or inspection of the stormwater management facilities.

8.3.3 O&M Plan Review and Approval Process

The O&M plan and associated agreements, covenants, and easements will be reviewed as part of the City's overall stormwater management plan review and approval process.

8.4 Privately-Owned and Maintained Facilities

Generally, stormwater BMP facilities that benefit single owners shall be privately-owned and maintained. All stormwater management facilities to be maintained privately require an O&M plan that is reviewed and approved as part of the overall stormwater management plan review process.

8.4.1 Maintenance Covenant for Private Stormwater Facilities

Maintenance of all privately-owned stormwater management facilities shall be ensured through the creation of a formal maintenance covenant that must be approved by the City and recorded into the land record prior to final plan and/or plat approval. A Maintenance Covenant Template is provided in **Appendix F**. The O&M plan, including scheduled inspections and regular maintenance activities, shall be referenced in the maintenance covenant.

8.4.2 Access Easement

Prior to the issuance of any permit that includes a stormwater management facility, the applicant or owner of the site must execute a maintenance covenant that includes access rights for the City, or its contractor or agent, to inspect the facility and ensure that it is maintained in proper working condition. This includes the right to enter a property when the City has a reasonable basis to believe that a violation of City standards and/or rules and regulations is occurring or has occurred, and to enter when necessary for abatement of a public nuisance or correction of a City violation. The access easement shall be included in the maintenance covenant, as approved by the City and recorded at the Clackamas County Clerk's office.

8.4.3 Annual Inspection and Maintenance

Annual inspections are to be conducted by the Responsible Party identified within the O&M Plan and may be reviewed by the City upon request. All stormwater management facilities must undergo an annual inspection to document maintenance and repair needs and ensure compliance with the requirements of these standards. Maintenance

needs may include the following: removal of silt, litter and other debris from all catch basins, inlets and drainage pipes; grass cutting and vegetation removal; and necessary replacement of water quality vegetation. Any maintenance needs identified must be addressed by the Responsible Party in a timely manner. The inspection and maintenance frequency may be increased as deemed necessary to ensure proper functioning of the stormwater management facility.

8.4.4 Records of Maintenance Activity

Facility owners shall keep records of all maintenance and repairs, and shall retain the records for at least 3 years. These records shall be made available to the City during inspection of the facility and at other reasonable times upon request. The owner shall submit a copy of the stormwater management facility maintenance and inspection records to the City annually as required.

8.4.5 City Inspection of Stormwater Management Facilities

Inspections may be conducted by the City at any time, including but not limited to, routine inspections, random inspections, inspections based on complaints or other notice of possible violations, inspections related to the City's NPDES stormwater permit, and joint inspections with other agencies done under environmental or safety laws. Inspections may include, but are not limited to, review of maintenance and repair records; sampling discharges, surface water, groundwater, or material/water in stormwater management facilities; and facility condition evaluations.

8.4.6 Failure to Comply with the O&M Plan

In the event that the stormwater management facility becomes a danger to public safety or public health, the City shall notify in writing the party responsible for maintenance of the stormwater management facility. Upon receipt of the written notice, the responsible person shall have 7 days (in accordance with the maintenance covenant) to effect maintenance and repair of the facility in an approved manner. If a responsible party fails or refuses to meet the requirements of the maintenance covenant, the City, after reasonable notice, may correct a violation of the design standards or maintenance needs by performing all necessary work to return the facility to proper working condition. After proper notice, the City shall assess the owner of the facility for the cost of repair work and any penalties.

8.4.7 Modifications to the O&M Plan

If it is determined that the O&M plan requires modification to maintain the functionality of the facility, then modifications to the O&M plan shall be submitted to the City for review and approval. Written approval from the City is required prior to modifying the O&M plan. The approved modified plan shall be recorded at the Clackamas County Clerk's Office.

8.5 Publicly-Owned and Maintained Facilities

Generally, publicly-owned and maintained stormwater management facilities are facilities that serve multiple property owners or the general public. Publicly-owned stormwater management facilities can serve any type of development (residential, multi-family, commercial, industrial). Publicly-owned facilities may be constructed by the City, or they may be constructed as part of a private development's stormwater management plan, with maintenance responsibilities transferred to the City following the 2-year maintenance warranty period.

8.5.1 O&M Plan

All stormwater management facilities to be maintained by the City require an O&M plan that is reviewed and approved as part of the overall stormwater management plan review process. The O&M plan is prepared by the applicant, identifying the City as the responsible party for inspection and maintenance following the 2-year warranty period (see **Chapter 9**).

During the 2-year warranty period, the applicant is responsible for all maintenance and documentation requirements outlined within the O&M plan. Prior to the completion of the warranty period, the City will require all maintenance records and documents be reviewed and deficiencies addressed prior to the transfer of maintenance responsibilities.

8.5.2 Modifications to the O&M Plan

Following the 2-year warranty period, at the City's discretion, the applicant may be required to prepare a modified O&M plan for public stormwater management facilities. If it is determined that the O&M plan requires modification to maintain the functionality of the facility, then modifications to the O&M plan shall be submitted to the City for review and approval prior to the release of the warranty surety.

8.5.3 Maintenance Fees

The City may establish maintenance fees for publicly-owned stormwater management facilities that serve multiple private owners. When separate maintenance fees are established, they will be distributed proportionally among the owners that utilize the facility for stormwater management.

CHAPTER 9

Submittal Requirements

CHAPTER 9. SUBMITTAL REQUIREMENTS

This chapter outlines the submittals required by the City of Oregon City (City) for stormwater and grading plans and other documents for review by the City's Community Development and Public Works Departments. This section is intended to standardize the submittals and clearly outline the minimum requirements. The requirement for a complete submittal package is intended to reduce the overall plan approval processing time. Refer to the City's engineering policies for additional information regarding plan submittals, as-built drawings, and the development approval process.

9.1 Submittal Requirements and Specifications

All applicants proposing development activities governed by these standards shall submit the plans, reports, studies, and information as required herein. The submittals shall be reviewed and approved by the City.

- The City may assist the applicant with submittal requirements by providing development review checklists and written and/or verbal direction of the minimum submittal requirements necessary to complete a comprehensive review of the plans.
- Submittals must be complete with minimum fees paid before they will be accepted by the City for review.
- Submittals will not be reviewed until a complete package has been submitted, including all the requirements listed in the applicable sections of this chapter.
- The City may require additional fees as applicable to be paid prior to review of any submittal.

9.1.1 Submittal for Land Use Application

When proposed development plans exceed the minimum thresholds listed in **Chapter 1**, applicants must submit the completed Site Assessment and Planning Checklist (see **Chapter 2),** including the following attachments, for City review and approval as part of the land use application process. These elements shall constitute a preliminary drainage report and form the basis for developing the stormwater management plan described in **Section 9.1.2**.

- Vicinity map
- Site assessment map
- Preliminary site plan
- Infiltration test results, as required (see **Appendix D**)
- Downstream analysis, as required (see **Chapter 5**)
- Seasonal groundwater depth evaluation, as required
- Print-out results from the BMP Sizing Tool, or equivalent calculations (see **Chapter 4**)
- Documentation of potential high-risk site uses (see **Chapter 6**)
- Other supporting documentation required to evaluate the feasibility of the project

9.1.2 Submittal for Stormwater Management Plan Approval

A stormwater management plan shall be submitted as part of the development review and approval process. The applicant shall submit sufficient supporting information to justify that the proposed stormwater management design meets all the provisions within these standards and the land use conditions of approval.

The information shall include the following as required:

A. Engineered drainage plans (see **Section 9.3**).

B. Drainage report (see **Section 9.4**).

C. Stormwater best management practices (BMP) sizing calculations from the BMP Sizing Tool Method or the Engineered Method (see **Chapter 4**).

D. Geotechnical engineering report/geologist report with required supporting information, such as infiltration testing, soils data, and design/construction recommendations (see **Section 3.1 and Appendix D**).

E. Engineer's cost estimate.

F. Public/private stormwater easements and conservation easements.

G. Spill prevention, containment and countermeasure plan (see **Chapter 6**).

H. Erosion prevention and sediment control (EPSC) plan (see **Chapter 7**).

I. Operations and maintenance (O&M) plan (see **Chapter 8**).

J. Private facility maintenance covenant (see **Appendix F**).

9.2 Grading Plan Submittals

Plan submittals must be in accordance with the City's engineering policies. This section contains guidelines for three types of grading plan submittals made to the City: engineered grading plans (**Section 9.2.1**), abbreviated grading plans (**Section 9.2.2**), and residential lot grading plans (**Section 9.2.3**). Refer to Oregon City Municipal Code (OCMC) 13.12 and 15.48 to determine which type of grading plan submittal is required.

9.2.1 Engineered Grading Plans

All engineered grading plans shall be prepared, stamped with the seal of, and signed by a Professional Engineer registered in the State of Oregon. Engineered grading plans shall include at least the following information:

9.2.1.1 Scale

The plan view shall be no smaller than a scale of 1 inch equals 100 feet. Recommended scale is 1 inch equals 50 feet.

9.2.1.2 Cover sheet Requirements

The first sheet, or cover sheet if one is provided, shall include the following:

A. North arrow.

B. Vicinity map showing project boundaries, streets with street names, streams and rivers, city limit boundaries, and section-township-range.

C. Legal description of the project site.

D. Name, address and telephone of owner of the project.

E. Name, address, and telephone of the Project Engineer.

F. Vertical and horizontal datum for the project.

G. Legend for symbols used in the plans.

H. City planning and public works file number, as applicable.

9.2.1.3 Test Locations

Show locations of soil test pits, infiltration tests, and other environmental evaluations conducted on the site.

9.2.1.4 Existing Topography

Show existing topography, as per the requirements for a topographic map for engineered drainage plans (see **Section 9.3.3**). Show existing slopes steeper than two-horizontal to one-vertical (2h:1v), with the slopes indicated.

9.2.1.5 Finished grade contours

Show finished grade contours. Show locations of top and toe of cut and fill slopes. Indicate the slope for any proposed slope steeper than 2h:1v.

9.2.1.6 Information on Site Water Resources

Show information concerning wetlands, environmentally-sensitive areas, water courses, natural buffer areas, and similar applicable information. Also show the boundaries of mapped Flood Management Areas and Natural Resource Overlay Districts (Reference: OCMC 17.42 and 17.49).

9.2.1.7 Locations of Disturbed Areas

Show clearing and grubbing limits. Show areas to be graded, filled, excavated, or otherwise disturbed. The location of tops and toes of graded slopes shall be indicated, together with the proposed steepness and height of these slopes. The location of stockpiles, haul roads, and disposal sites shall also be indicated.

9.2.1.8 Quantities of Cut/Fill

Show quantities, in cubic yards, of excavation and/or fill throughout the project site.

9.2.1.9 Locations of Stormwater Features

Show existing channels, swales, and drainage pipes that either convey offsite stormwater through the project site, or collect and discharge site runoff from the project site.

9.2.1.10 Locations of Drainage Structures

Show locations of pipes, pipe information (size, materials, and slopes), manholes, catch basins, and inlet structures which are to be constructed as a part of the grading plan.

9.2.1.11 Construction information

Show information concerning construction methods, fill material specifications, source of fill material, compaction specifications, haul routes, and other construction information when known and applicable.

9.2.1.12 Standard grading notes

Engineered grading plans shall include, at a minimum, the standard grading notes per the City's Public Works standards.

9.2.2 Abbreviated Grading Plans

Abbreviated grading plans shall be prepared, stamped with the seal of, and signed by a Professional Engineer registered in the State of Oregon. Abbreviated grading plans shall include the following information:

9.2.2.1 Narrative

Applicants shall submit a narrative describing the project's parameters for grading the site to include the total square footage of new impervious surface. Describe what the project will accomplish and how the project will be executed. Describe how the grading will affect surface water drainage and what is being proposed to ensure that the new drainage pattern will direct the surface water to an approved outfall.

9.2.2.2 Drawings

Provide a simple sketch depicting the topographical lines of the site. Show the project's boundaries and the final desired grading lines versus the existing pre-grading lines. Show drainage patterns with the final outfall. Show a north arrow and at least one street for reference. Drawings shall be printed on paper no smaller than 8.5 by 11 inches, provided sufficient scale can be shown on this size. Otherwise, the drawing shall be printed on 11- by 17-inch paper.

9.2.2.3 Scale

The plan view shall be no smaller than a scale of 1 inch equals 100 feet. Recommended scale is 1 inch equals 50 feet.

9.2.3 Residential Lot Grading Plans

Residential lot grading plans shall be prepared, stamped with the seal of, and signed by a Professional Engineer registered in the State of Oregon. Residential lot grading plans shall include at least the following information:

9.2.3.1 Purpose

A residential lot grading plan illustrates that the storm drainage system is designed to accommodate the drainage patterns of the final graded project. It also provides protective slopes away from all sides of a building.

9.2.3.2 Approved discharge point

Stormwater from residential impervious surfaces (roofs, driveways, etc.) must be conveyed to an approved stormwater discharge point, which is commonly a stormwater management facility. To accomplish this, roof drains may be connected directly to a public storm drainage system by means of a lateral pipe. Stormwater from roofs may also drain directly to a public street through a curb if the building's top of foundation is at least 2 feet above the curb elevation. (The 2 feet is the minimum elevation difference considered necessary to allow for positive drainage for the footing drain.) If roof drains cannot be collected and conveyed to a stormwater management facility, other means of disposal, such as seepage trenches, shall be identified on the plans. These other methods will be reviewed and approved by the City on a case-by-case basis and shall be discussed in the drainage report.

9.2.3.3 Protective slopes

Protective slopes away from all sides of all buildings are essential elements of all lot grading plans. The purpose of the protective slopes is to drain surface water away from all building walls and backfill areas. Where such a protective slope meets a slope that drains toward a building, a drainage swale of adequate width, depth, and longitudinal gradient is necessary to carry away surface water without flooding against buildings or ponding any lot areas.

9.2.3.4 Basic lot grading types

The Federal Housing Administration has established basic lot grading types. Others may exist depending on the uniqueness of the topography. The three basic lot types are as follows:

- Lot Grading Type A – all drainage to street.
- Lot Grading Type B – drainage to both street and rear of lot.
- Lot Grading Type C – all drainage to rear lot line.

See exhibits of lot grading types in the City's Public Works standards.

If Lot Grading Type B or C is selected, flows may not be channeled or concentrated onto adjacent properties without the creation of a private drainage easement to convey the water to a natural location or public stormwater system. See **Chapters 5 and 8** of these standards for additional discussions regarding drainage easements.

9.2.3.5 Relationship to Street Elevation

The single most important grade relationship for proper lot grading and drainage is top of foundation elevation in relation to street elevation. If the floor elevation is too low in relation to adjoining street grades, adequate protective slopes and drainage swales cannot be provided to drain the site satisfactorily.

Proper top of foundation elevation and lot grades for any lot can be obtained by establishing a lot grading control line on the plans and on the ground appropriate for the specific property. The line is located differently for each lot grading type as shown by the circles lettered A, B, C, etc., in the exhibit shown in the City's Public Works standards. Each control line starts at the top of the street curb near the indicated high or low lot corner and ends up at the top of the building foundation. Specific design criteria for the grading control line can be found in the residential lot grading notes in the City's current Public Works standards. The grading control line must be checked for each lot or parcel.

9.2.3.6 Rough Grading

Residential lot grading plans shall be based on final rough grading as-built conditions which are certified by the Project Engineer to $\pm$ 0.1 foot.

9.2.3.7 Scale

The plan view of detailed drainage plans shall be drawn at an appropriate engineering scale no smaller than 1 inch equals 50 feet; when more detail is required, a scale of 1 inch equals 20 feet is preferred.

9.2.3.8 Cover Sheet Requirements

The first sheet, or cover sheet if one is provided, shall include the following:

A. North arrow, vicinity map, project boundaries, streets with street names, streams and rivers, city limit boundaries, and section-township-range.

B. Legal description of project site.

C. Name, address, and telephone of the owner of the project.

D. Name, address, and telephone of the Project Engineer.

E. Datum for the project.

F. Legend for symbols used in the plans.

G. City planning and public works file number, as applicable.

H. Basis of bearing.

I. Onsite temporary benchmark.

9.2.3.9 Other Plan Sheet Requirements

A. Standard residential lot grading notes.

B. Standard detail for typical grading patterns.

C. Existing and proposed lot/parcel lines including intersecting adjoining properties.

D. Lot/parcel dimensions.

E. Lot/parcel identification.

F. Street centerlines.

G. Estimated building envelope (show a building envelope size, based on underlying zone setbacks that may be considered typical for the type of development and its location).

H. Existing or proposed curb; if no curb, centerline and edge of street pavement.

I. Top of curb elevations at intersection of curb and property line extensions (at ends of curb returns on corner lots); if no curb, centerline and edge of pavement elevations at intersection with property line extensions; elevations to hundredths of feet.

J. Existing contour lines (minimum 2-foot interval) including adjacent property within 50 feet.

K. Finished grade elevations to the nearest tenth of a foot[1].

L. Lot grading type for each lot or parcel.

M. Top of foundation elevations to the nearest tenth of a foot.

N. Flow arrows shown in street gutter.

O. Flow arrows shown in swales per typical lot grading type detail.

P. Existing and/or proposed storm system.

9.3 Engineered Drainage Plans

All engineered drainage plans shall be prepared, stamped with the seal of, and signed by a Professional Engineer, registered in the State of Oregon. Landscape plans for public stormwater management facilities shall be prepared, stamped with the seal of, and signed by a Landscape Architect, registered in the State of Oregon. The engineered drainage plans shall contain the following information.

[1] When the average slope on a proposed lot in the likely location of the structure is greater than 5 percent, it is not necessary to show finished grade elevations to the nearest tenth of a foot on the residential lot grading plan. For these cases, identify a discharge location for roof drainage. (The average slope on a proposed lot shall be calculated by using the average of the three slopes at the two edges of the structure and the middle of the structure.)

9.3.1 Cover Sheet

The first sheet, or cover sheet if one is provided, shall include the following:

A. North arrow, vicinity map, project boundaries, streets with street names, shorelines, if any, city limit boundaries, if any, and section-township-range.

B. Legal description of project site.

C. Name, address, and telephone of owner of project.

D. Name, address, and telephone of Project Engineer.

E. Datum for project.

F. Legend, in the event that symbols are used in plans.

G. City planning and public works file number, as applicable.

H. Basis of bearing.

9.3.2 Index

At least one sheet shall contain a plan view of the entire project site. For large sites, the sheet containing the plan view of the entire site shall serve as an index to subsequent detailed plan sheets.

9.3.3 Scale

The plan view of detailed drainage plans shall be drawn at an appropriate engineering scale no smaller than 1 inch equals 50 feet; when more detail is required, a scale of 1 inch equals 20 feet is preferred.

9.3.4 Topographic Plan

Plans shall include a topographic map showing existing conditions for the site, including:

A. Current topography for the site and extending 250 feet beyond project boundaries, where practicable. Existing topography for adjacent rights-of-way (ROWs) must be included for the full width of the ROW. Slopes steeper than 25 percent shall be identified.

B. Contours extending at least 250 feet beyond project boundaries, where practicable, and including the full width of adjacent ROWs. Contours shall be at maximum 5-foot vertical elevation intervals for steep locations (greater than 20 percent) and maximum 2-foot vertical elevation intervals for other locations. Locations and elevations of at least two benchmarks in the project vicinity must be shown.

C. Existing structures, including all structures within 250 feet of project boundaries, where practicable.

D. Existing access locations for the project site.

E. Existing project boundaries, ROWs, easements, jurisdictional boundaries, and sectional boundaries. All shall be clearly identified by note or symbol and key. Project boundaries shall include bearings and dimensions as referenced on existing documentation.

F. Adjacent streets, including street names, centerline, and ROW boundaries. Widths of adjacent ROW shall be noted.

G. Existing utilities, including franchised utilities located above or below ground and drainage facilities that transport surface water onto, across, or from the project site. The existing drainage pipes, culverts, and channels shall include the invert or flow line elevations.

H. Existing environmentally-sensitive areas (e.g., gullies, ravines, swales, wetlands, steep slopes, estuaries, springs, wetlands, creeks, lakes, etc.). For natural drainage features, show direction of flow and 100-year flood plain boundary (if applicable). Also, show the boundaries of mapped Water Quality Resource Areas and Flood Management Areas. (Reference: OCMC 17.49).

I. Existing wells, sanitary sewer systems, septic tanks, and drainfields within the project's boundaries. Show all known existing wells, sanitary sewer systems, septic tanks, and drainfields within 250 feet of project boundaries, to the extent possible with the adjacent property owner's cooperation. Describe abandonment procedure.

J. Existing fuel storage tanks.

9.3.5 Drainage Improvement Plans

Plans for proposed drainage improvements shall include the following:

A. Finished grades. Show the extent of cuts and fills by existing and proposed contours, profiles, and/or other explicit designations.

B. Existing structures to be removed.

C. Proposed developed areas and structures including roads and road improvements, parking surfaces, building footprints, walkways, landscape areas, etc. Depict all lines, grades, and gradients to the nearest 0.1 foot of proposed public roadways.

D. Proposed lot boundaries, tracts, and easements. Also, proposed changes to project boundaries, jurisdictional boundaries, and ROW boundaries.

E. Proposed sanitary sewers, water systems, and other related utilities, showing line and grade to the nearest 0.1 foot of all proposed utilities at crossings with the proposed drainage system.

F. Proposed fuel storage tanks. (see **Chapter 6.3**)

G. Locations of proposed structural source controls to address high pollutant potential site uses, if applicable (see **Chapter 6**).

H. Setbacks from existing environmentally sensitive areas.

I. Proposed drainage structures, including pipes, open channels, culverts, ponds, vaults, biofiltration swales, infiltration facilities, outfalls, riprap treatment, energy dissipaters, etc. All projects must identify conveyance including the emergency overflow path as described in **Chapter 5.**

J. Plan views of drainage conveyance facilities for which there is no accompanying profile view. These shall include the following information: pipe sizes, pipe types and materials, lengths of runs, gradients, and locations to the nearest 0.1 foot of pipes or channels, structure identifier (e.g., catch basin/manhole number), type of struc-

ture (e.g., Type 2 CB), exact location of structures (e.g., station and offset mainline stationing and/or street centerline stationing, or dimensioning to the nearest 0.1 foot), invert elevations in/out of structures to the nearest 0.1 foot, and top elevations of structures to the nearest 0.1 foot. Notes shall be included referencing details, cross-sections, profiles, etc.

K. Locations of all gutter or ditch flowlines, including flow arrows indicating direction of flow.

L. Profiles for roadway systems with curbs. If a roadway system with curbs is to be constructed in a proposed or existing public ROW, profiles to the nearest 0.1 foot for the following items will be a part of the plan set:

- Curb returns with elevations shown for the beginning of curb (PC), end of curb (PT), quarter points, and low points. Should the roadway section be warped in the vicinity of the PC or PT to manipulate the low point location (sometimes done to move a catch basin location away from a handicap ramp), this area of warping will also be shown in this profile. Straight-line segment between data point profiles will be allowed, as they should communicate the design intent. Station equations relative to street centerline stationing shall be shown for the PC and PT.
- Cul-de-sacs and knuckles with elevations shown for the PC, PT, low points, and 25-foot intervals along the curve. Station equations relative to street centerline stationing shall be shown for the PC and PT.
- Pavement spot elevations within some major intersections may be necessary.
- Alignment data for proposed roadways (centerline bearings and distances, curve data, and other pertinent data).
- See the City's engineering policies for additional requirements.

M. Proposed construction phasing.

9.3.6 Plan and Profile

In existing and proposed ROWs and storm easements, drainage conveyance facilities shall be shown in profile view. Where practicable, the stationing of the plan view should line up vertically with the stationing of the profile view.

Profile views shall be located below the plan view on the same sheet and include the following:

A. Existing and finish grades.

B. Proposed drainage pipes, channels, and structures.

C. Existing underground utilities where such utilities cross proposed drainage facilities.

D. Pipe sizes.

E. Pipe types and materials.

F. Lengths of runs, gradients, and exact locations of pipes or channels to the nearest 0. 1 foot.

G. Structure identifier (e.g., catch basin/manhole number).

H. Type of structure (e.g., Type 4A Inlet).

I. Exact location of structures (e.g., station and offset mainline stationing and/or street centerline stationing, or dimensioning to the nearest 0.1 foot).

J. Invert elevations in/out of structures, and top elevations of structures.

K. See the City's engineering policies and standard drawings for additional requirements.

9.3.7 Construction Notes

Construction notes shall appear on drainage plans. These notes shall include, at a minimum, the drainage notes included in the City's engineering policies and standard drawings.

9.3.8 Cross Sections

Cross sections shall be provided for the following:

A. Roadways, including access roads.

B. Stormwater management facilities, including rain gardens, stormwater planters, pervious pavements, and detention ponds. The cross sections shall graphically illustrate the following elevations to the nearest 0.1 foot:

- The maximum water surface elevation for the 10-year design storm
- The proposed dead storage water surface elevation (as applicable)
- Amended soil section or porous pavement section (as applicable)

C. Proposed ditches and swales.

9.3.9 Drainage Structure Details

Separate detail sheets shall be provided for all proposed drainage structures and stormwater management facility control structures for which there is insufficient information in the plan view.

9.3.10 Erosion Prevention and Sediment Control Plan

Include detailed erosion prevention and sediment control plans, following the requirements of **Chapter 7** and the City's **Erosion Standards**.

9.3.11 Stormwater Management Facility Grading Plan

A detailed grading plan at a scale of 1 inch equals 20 feet shall be provided for all landscaped stormwater management facilities. This plan shall include the following:

A. Current ground contours (screened) and proposed ground contours at a minimum of a 2-foot contour interval. Slopes steeper than 6h:1v shall be identified.

B. Location of top and toe of slope.

C. Limits of embankment designed to impound water.

D. Location of all drainage structures as well as any other piped utilities in the vicinity.

E. Flow route of the secondary/emergency overflow system.

F. Maintenance access, as applicable.

9.3.12 Landscape Plan

Landscape plans for publicly-maintained stormwater management facilities shall be prepared, stamped with the seal of, and signed by, a Landscape Architect, registered in the State of Oregon. Plans for privately-maintained stormwater management facilities do not require the involvement of a Landscape Architect.

A detailed landscape plan, at a scale of 1 inch equals 20 feet shall be provided for each landscaped stormwater management facility. This plan may be combined with the stormwater management facility grading plan (**Section 9.3.10**). See **Appendix A** for further guidance. The landscape plan shall include the following:

A. Existing vegetation to be preserved and protective construction fencing.

B. Areas of stormwater management facilities to be designated with construction fencing to protect from construction traffic and compaction.

C. Final ground contours at a minimum of a 2-foot contour interval.

D. Location of top and toe of slope.

E. Limits of embankment designed to impound water.

F. Location of all drainage structures as well as any other piped utilities in the vicinity.

G. Limits of areas to receive amended topsoil and growing medium.

H. A plant list or table, including botanic and common names, size at time of planting, quantity, spacing, type of container, evergreen or deciduous, and other information related to the facility-specific planting, in accordance with landscape industry standards.

I. Location of stockpiles (erosion protection measures must be shown on the EPSC plan).

J. Method of temporary irrigation to be used for the establishment period.

K. Location of maintenance access, as applicable.

9.4 Drainage Report

The drainage report shall accompany the drainage improvement plans to complete documentation of the design and design intent. The drainage report shall be prepared by and bear the seal and original signature of a Professional Engineer registered in the State of Oregon. The Professional Engineer shall ensure that the drainage report matches and accounts for the design displayed on the grading and drainage construction plans.

9.4.1 Drainage Report Contents

The drainage report shall contain the following information:

A. **Cover sheet**, including the project name, City's planning and public works file number (as applicable), Project Engineer's name, address and telephone number, Applicant's name, and date of submittal.

B. **Table of contents**, showing the page numbers for each section of the report, including exhibits, appendices, and attachments.

C. **Vicinity map**.

D. **Basin maps** that show the following:

- Project boundaries
- Offsite contributing drainage basins
- Onsite drainage basins
- Approximate locations of all major drainage structures
- The course of stormwater originating from the subject property and extending all the way to the closest receiving body of water
- Reference to the source of the topographic base map (e.g., U.S. Geological Survey [USGS])
- Map scale
- North arrow

E. **Project Description**. Describe the project, including the size and location of the project site, address or parcel number and legal description of the property, property zoning, proposed land use, proposed site improvements, proposed construction of impervious surfaces and proposed landscaping.

F. **Required Permits**. Describe other permits required (e.g., Joint Oregon Division of State Lands/U.S. Army Corps of Engineers 404 fill permit, National Pollutant Discharge Elimination System 1200-C permit, Oregon Department of Environmental Quality permits, etc.) and submit application summaries.

G. **References to relevant reports**. Identify basin plans, flood studies, groundwater studies, wetland designation, water quality resource areas designation, sensitive area designation, environmental impact statements, lake restoration plans, water quality reports, etc. Where such reports impose additional conditions on the project, those conditions shall be included in the report.

H. **Existing Conditions**. Describe existing site conditions, including the following:

- Site topography, land cover, and land use on the project site and abutting properties
- Hydrologic conditions including natural and constructed channels, creeks, lakes, ponds, wetlands, ravines, gullies, steep slopes, springs, and other environmentally-sensitive areas on or adjacent to the project site
- Points of discharge for existing drainage from the project site
- Offsite drainage to the property, based on a field investigation, and any identified drainage and/or erosion problems
- Boundaries of mapped Natural Resource Overlay Districts and Flood Management Overlay Districts, and groundwater sensitive areas (reference maps and reports as applicable)
- Locations of known /recorded wells on the project site and on adjacent property within 250 feet of the project boundaries

- Locations of existing fuel tanks, in-use or abandoned, within the project boundaries
- General soils conditions present within the project site

I. **Drainage Basin Description.** Describe the drainage basins to which the project site contributes runoff, and identify the receiving waters for each of these drainage basins.

J. **Developed Site Drainage Conditions**: Describe the land cover resulting from the proposed project. Describe the proposal for the collection and conveyance of site runoff and offsite drainage areas. Describe proposed stormwater management facilities.

K. **Downstream Analysis**: Conduct and document the downstream analysis that encompasses the entire tributary drainage area that drains to the project site and extends downstream as required in **Chapter 5**. The downstream analysis shall include a map (minimum USGS 1:24000 Quadrangle Topographic Map) to delineate the study area. Describe in narrative form observations regarding the makeup and general condition of the drainage system. Include such information as pipe sizes, channel characteristics, and stormwater facilities.

L. **Contributing Areas**: Define and quantify the area and land use draining to each proposed stormwater management facility.

M. **Hydraulic Design Computations**. Document the methodology, assumptions, and results of calculations to support the design of all proposed stormwater management facilities and existing and proposed conveyance systems. Include a description of how the stormwater system will function during the water quality storm and peak flow events. Printouts from the BMP Sizing tool or equivalent calculations to document the Engineered Method shall be included in an appendix. Include capacity and backwater analyses when required either as part of the proposed drainage design or as a part of the downstream analysis. Other flow routing computations may be needed for wetland impact analysis or for flood plain analysis.

N. **Emergency Overflow**. Provide a narrative description of the 100-year overflow path from each stormwater management facility and storage capacity of all stormwater management facilities during the 100-year event.

O. **Erosion Prevention and Sediment Control**. Describe proposed strategy to address erosion prevention and sediment control (see **Chapter 7**).

P. **Maintenance Strategy.** Provide a narrative discussion that addresses the O&M needs of the proposed stormwater management facilities (see **Chapter 8**).

Q. **Landscape Plan.** Provide a narrative discussion about plant material selection and design objectives, such as shading, aesthetics, and/or temperature control (see **Appendix A**).

9.4.2 Drainage Report Appendices

Appendices to the drainage report shall include technical information including, but not limited to the following:

A. Site planning checklist (see **Chapter 2**).

B. Soils report and/or geotechnical report, where applicable (see **Section 3.1**).

C. BMP Sizing Tool or Engineered Method design calculations for all proposed stormwater management facilities (see **Chapter 4**).

D. Runoff calculations, including time of concentration calculations (see **Chapter 5**).

E. Conveyance system capacity calculations (See **Chapter 5**).

F. Curb and catch basin inlet sizing and spacing to meet the requirements of **Section 5.7.2** (street flooded width calculations as required).

G. Energy dissipater calculations.

H. Downstream analysis.

I. O&M manual: Required for stormwater management facilities.

- For privately owned and maintained facilities: two copies of the O&M manual shall be attached to the Maintenance Covenant and submitted to the City for review prior to recording.
- For publicly owned and maintained facilities two: copies shall be sent to Public Works prior to acceptance.
- See the City's engineering policies for quantity and format of required documents.

9.5 Standard Drawings and Details

The City's standard drawings shall be used for public and private development projects and cannot be modified by designers on a project-by-project basis. It is the responsibility of the project engineer of record to incorporate these drawings as originally intended.

9.6 Plan Review and Approval Processes

The City's plan review and approval requirements are outlined in OCMC Title 17. The process may vary from one application, submittal, and building permit to another. To obtain further information on a specific plan review or permit process, contact the City.

9.7 Construction Considerations

If required, the engineer, contractor, applicant, City, and/or other related agency representatives will hold a pre-construction meeting to share information and requirements as specified in the stormwater management plan. Upon final completion of the construction, the Engineer of Record will certify that the construction as-built drawings are complete in all respects and built per the approved construction documents. At a minimum the following shall be done prior to requesting the final inspection of the stormwater facilities:

A. Clean all stormwater management facilities of sediment and debris.

B. Submit a Certification of Completion to certify that the project was constructed in accordance with the approved plans and City standards.

C. Submit a Vegetated Planting Certification to certify that water quality plantings were constructed in accordance with the approved plans and these standards.

D. Submit as-built drawings according to **Section 9.9**.

E. Submit storm video testing and reports for all public storm system construction.

F. Submit engineer inspection reports.

9.8 Warranty Surety

The City may require the applicant to submit a financial surety in a form acceptable to the city to guarantee performance or warranty of the requirements of these standards. In general, the warranty surety ensures that the owner/ applicant agrees to maintain, repair, replace, and be responsible for damage to the storm sewer for a warranty period of 2 years following the date the City deems the improvements to be complete. Upon default, the City may perform the remaining work or remedy violations and draw upon the surety or available funds.

9.9 As-built Submittals

All drainage plans shall be as-built prior to the acceptance of the project. As-built drawings are necessary to ensure that the project was constructed per the approved plans. As-builts may be required in paper, Mylar, and/or electronic AutoCAD files, as determined by the City. The Engineer of Record is responsible for record keeping, inspection and preparation of the as-built drawings. As-built drawings shall contain, at a minimum, the following information:

A. Each page shall be stamped by the Professional Engineer and stated in writing that it is an as-built drawing.

B. Show final storm pipe material type in profile view.

C. Show alignment changes, slope changes, pipe size changes and changes in construction materials.

D. Indicate areas of rock removal not completed by standard backhoe (i.e., splitter or blasting).

E. Show storm service connections for each building lot with a callout showing the mainline stationing, pipe size, length, and depth at the property line.

F. Street stationing and other related information is allowed on the construction plans; however this must be removed on the accepted as-built drawings.

G. Remove all hatching associated with material type.

H. Paper and electronic as-built drawings shall become the unencumbered property of the City and are public records that may be distributed as the City deems necessary.

I. The timely submittal of as-built plans is the responsibility of the Engineer of Record. The City requires all as-built drawings to be submitted within 60 days of completion of the project.

J. See the City's engineering policies for current as-built requirements.

APPENDIX A

Facility Planting Guidance

APPENDIX A. FACILITY PLANTING GUIDANCE

A.1 Introduction

This appendix provides information on plant selection and design guidance for a variety of stormwater management facilities. The role of plants in facilities is critical. The success or failure of a facility can depend on the proper selection and location of plants. The main purpose of vegetation in facilities is to provide the maximum amount of water quality benefit for stormwater management.

A complex combination of physical and biological processes work in tandem to maximize water quality within stormwater management facilities. In addition, there are a range of considerations for plant selection and design, including the site context, protection of native biodiversity, creation of habitat, limitation of noxious invasive species, site context, and aesthetics. The following sections provide guidance for the proper selection of plants.

This section provides guidance for preparing planting plans for stormwater management facilities including developing the plan, specifying growing media material, and selecting plant species. The guidance shall be incorporated into the landscape plan for each vegetated stormwater management facility proposed on a project.

> *"The surface area of a typical stormwater facility allows runoff to pond and evaporate while sediments settle into a layer of mulch. The organic mulch layer prevents soil bed erosion and retains moisture for plant roots. It also provides a medium for biological growth and the decomposition or decay of organic matter. The soil stores water and nutrients to support plant life. Worms and other soil organisms are very good at degrading organic pollutants, like petroleum-based compounds. They also help mix organic material, increase aeration, and improve water infiltration and water holding capacity. Bacteria and other beneficial soil microbes process the majority of pollutants, including most of the nitrogen. The stiff structure of plants such as rushes and sedges slows water passage and traps sediments within the surface area of the facility."*
>
> --City of Portland, BES
> *Stormwater Management Manual*, 2008

A.2 General

All vegetated stormwater management facilities proposed for City maintenance shall have a Landscape Plan prepared, stamped, and signed by a Landscape Architect or Professional Engineer. In addition, a geotechnical report letter may be required that discusses the site's suitability for the type of stormwater management facility proposed.

A.2.1 Native and Adapted Plants

Plants approved for stormwater management facilities can be grouped into three categories: natives, native cultivars, and non-native adapted plants.

Native plants are plants that are indigenous to our specific region. They typically require minimal care once they are planted because they have evolved and adapted to the growing conditions and climate of the region. Because of their place in the local ecology, native plants also provide habitat value for birds and other local species. For these reasons, native plants and/or native cultivars are required for stormwater management facilities and should be used to the maximum extent practicable. In designated vegetated buffers and sensitive areas only native plants are allowed in stormwater management facilities.

Native cultivars are cultivated varieties of native plants produced by horticultural techniques and are not normally found in wild populations. Cultivars are bred for certain desired characteristics that make them different from their native counterparts. Native cultivars may be selected over a native plant if it is more suitable for certain conditions, such as densely urbanized applications. For example Kelsey Dogwood (*Cornus sericea 'Kelseyi*) is a cultivar of the native Red Twig Dogwood (*Cornus sericea*). Kelsey Dogwood has been selectively bred to be much smaller at maturity than red twig dogwood, which can be advantageous in small-scaled urban stormwater planters. In such instances, the native cultivar is preferred because it will not outgrow the facility or require frequent pruning maintenance, while still offering the same vegetative advantages as its native counterpart.

Non-native adapted plants are plants that are not native to our region, but have certain characteristics that make them very useful and well adapted to stormwater management facilities. The City prefers that native and native cultivars be used whenever practical, but will allow non-native adapted plants where appropriate.

A.2.2 Vegetated Facilities and Habitat

Vegetated stormwater management facilities can be designed to mimic the natural habitats, processes, and hydrology of a particular site.

The environmental benefits of these facilities include:

- Less disturbance to sites than conventional stormwater management methods
- Reduced and delayed peak stormwater flows
- Reduced discharge of pollutants
- Increased planted space and habitat
- Creation of a multifunctional landscape that enhances visual and functional amenities

Nearly all vegetated stormwater management facilities have the potential to create and improve habitat on and near the site through planting and vegetation. Each vegetated stormwater management facility has planting design guidelines such as required plant spacing and plant types, but there is flexibility to maximize habitat for a variety of organisms such as invertebrates, amphibians, small mammals, and birds. Created habitat can also enhance conditions for predators that feed on mosquitoes. These on-site benefits generate off-site benefits by reducing the negative environmental effects associated with urban development.

A.2.3 Climate and Microclimate

All stormwater management facility vegetation should be well-adapted to both the northwest regional climate and the facility's microclimate. Although regional climate dictates average seasonal temperatures, amount of rainfall and available daylight, site-specific microclimates can vary considerably and should be factored into the planting design, particularly in an urbanized environment. For example, sword fern is a plant native to woodlands of the Pacific Northwest that likely would not survive if placed in a south facing flow-through planter with direct sun exposure most of the day and heat radiating off the building. Sword fern placed in a flow-through planter on the north side of the building likely would thrive.

A.2.4 Habitat Diversity and Layering of Plants

Natural environments in the Pacific Northwest are characterized by diverse, layered plant habitats. A range of habitats can be created in vegetated stormwater management facilities by selecting complementary vegetation to plant together, such as groundcovers, perennials, shrubs, and trees. The structural variety of a diversified planting design can also improve site aesthetics. Plant selection should reflect this natural ordering of plantings, as well as mimicking a mixture of deciduous and evergreen materials.

A.2.5 Planting Zones by Facility Type

Vegetation for stormwater management facilities is categorized according to the degree of soil moisture that will be encountered in the facility. Planting conditions for sloped, basin-like stormwater management facilities such as swales, rain gardens and detention ponds have a moisture gradient which varies with the designed maximum water depth, the time it takes for a facility to drain after a storm event, and the steepness of the side slopes. Planting conditions are more uniform for planters and vegetated filter strips because of the relatively uniform and flat surface. For green roofs, the critical planting factor is the depth of the planting soil.

Consideration of these zones will enhance the success of a facility's planting design. The zone from the bottom of the facility to the designed high water line or top of freeboard should be planted with plants that tolerate occasional standing water and wet-to-moist conditions. Above the designed high water line vegetation is not affected by stormwater entering the facility and should be planted with species well-suited to the local climate and site-specific conditions. **Figure A-1** shows the planting zones for typical facility types.

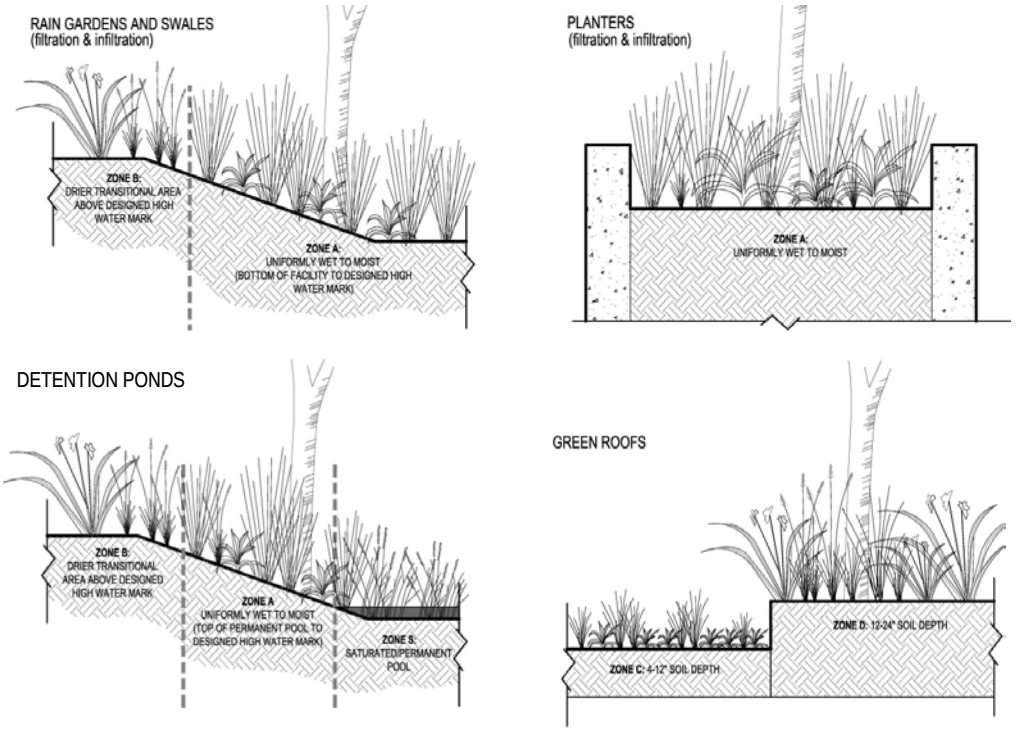


Figure A-1. Planting zones by facility type

A.2.6 Maintenance

Water efficient irrigation shall be applied for at least the first 2 years after construction of the facility, particularly during the dry summer months, while plantings become established. The applicant may choose the irrigation method such as by truck or irrigation system. When practicable, the on-site irrigation is recommended to maintain the plant survivability. Temporary irrigation will require its own service meter and backflow prevention device. Temporary irrigation systems must be fully removed before the City releases the warranty surety bond.

Additional maintenance practices include:

- Check regularly for weeds. Remove weeds or invasive plants such as blackberries and ivy, and implement a weed control program as needed.
- Check mulch regularly to maintain uniform coverage. Many vegetated stormwater management facilities specify a mulch cover such as river rock to prevent erosion and moisture loss during dry periods.
- Replant bare patches as necessary to comply with the facility's coverage requirements and maintenance plan.
- For a full list of maintenance practices for each type of stormwater management facility, see **Appendix C**.

A.2.7 Fencing

Designers are encouraged to adjust the design of stormwater management facilities to minimize or eliminate the need for fencing. If fencing is required or used, the designer should use an aesthetic wall or fence related to the building and site architectural style. When chain link fencing is used, it must be screened with plantings that conform to the site design. In some locations, OCMC Zoning Code may prohibit fencing or require screening. The designer is required to determine what sections of OCMC Zoning Code apply to the project. If fencing is prohibited, the designer may have to change the facility design to eliminate fencing requirements.

Where fences are required, they must be at least 4 feet high, unless certain elements of the stormwater management facility design dictate a higher fence. Fencing materials and colors shall be complementary to the site design.

Public Facilities: Fences are required for all ponds with a permanent pool greater than 18 inches deep, interior side slopes steeper than 3h:v1, or any walls/bulkheads greater than 24 inches in height. However, a pond with gently sloping sides (less than 3h:v1) and a 10-foot-wide safety earth bench around the facility at the point of slope transition would not require a fence. When fencing is required around a pond, a minimum of one locking access gate shall be provided that is 16 feet wide, consisting of two swinging sections each 8 feet in width. At least one pedestrian gate must be provided, with a minimum 4-foot width. Fence material shall be No. 11 gauge galvanized steel fabric with bonded vinyl coating. Vinyl coating shall be a color designed to blend with the surrounding area (likely green, brown, or preferably black). Fence posts shall be galvanized steel, with top caps, and set a minimum of three feet deep in concrete. Crossbars shall connect adjacent fence posts, with diagonal braces at corners and ends. All posts, cross bars and gates shall be painted or coated the same color as the vinyl clad fence.

Private Facilities: Fencing for privately owned facilities is at the discretion of the owner. However, private owners are encouraged to follow the above criteria for public facilities when determining private facility requirements. When any fencing is used, it must be consistent with the City's fencing requirements. In some locations OCMC Zoning Code may prohibit or restrict the type of fencing or require screening. If fencing is prohibited, the designer may have to change the facility design to eliminate fencing requirements.

A.3 Planting Plan Methods

Planting plans shall be required for each vegetated stormwater management facility. Planting plans should address four major components: hydrology, soils, plant materials, and maintenance. When developing planting plans, the following steps should be used:

Step 1: Assess Hydrologic and Hydraulic Conditions

Use the hydrologic and hydraulic analysis for the facility to determine water levels for various storm events. Use the cross sections in **Figure A-1** to assign appropriate hydrologic zones to the facility and identify the hydrologic zones on the plan. Most facilities include one or more of the following planting zones with respect to hydrology during the growing season:

- Wet (Zone S): standing or flowing water/nearly constant saturation; anaerobic soils
- Moist (Zone A): periodically saturated; anaerobic and/or aerobic soils
- Dry (Zones B, C, and D): infrequent inundation/saturation, if any; aerobic soils

Step 2: Plant Selection

Identify plants to be preserved, select plant materials, designate quantities, placement and planting zones.

A. *Preservation:* Every effort shall be made to protect a site's existing native vegetation. Native vegetation along Sensitive Areas and Vegetated Buffers shall be retained to the maximum extent practicable.

B. *Selection:* Plant selection shall be from the plant lists found in **Tables A-1** through **A-4**. Unless approved by City staff, planting restrictions are as follows:

- Deep rooting trees and shrubs (e.g., willow) shall not be planted on top of concrete pipes, or within 10 feet of retaining walls, inlet/outlet structures or other culverts
- Large trees or shrubs shall not be planted on berms over 4 feet tall that impound water. Small trees or shrubs with fibrous root systems may be installed on berms that impound water and are less than 4 feet tall

C. *Quantities:* Plant quantities are calculated per 100 square foot of facility area. Plant quantities can be calculated as follows:

- Moisture Zone (S): 115 herbaceous plants
- Moisture Zone (A): 3 large shrubs/small trees, 4 small shrubs, and 115 groundcover plants
- Moisture Zone (B): 1 tree, 3 large shrubs/small trees, 4 small shrubs, and 115 groundcover plants
- Moisture Zone (C & D): 115 sedums, succulents, and herbaceous plants

D. *Minimum Sizes:*

- Herbaceous plants: SP #4 container
- Small shrubs/groundcover: # 1 container
- Large shrubs/small trees: 30" Height
- Deciduous trees: 1" caliper
- Evergreen trees: 6' height

E. *Design:* All planting plans must have a minimum of 50 percent evergreen plants and at least two species from the herbaceous and small shrubs/groundcover plant communities. However, trees are not required or recommended in fully lined facilities.

Step 3: Installation

Determine plant installation requirements and assign specifications to plans.

A. *Timing:* Recommended installation timeframes are as follows. Planting or seeding outside these times may require additional measures to ensure survival which shall be specified on the plans and require City approval.

- Containerized stock: February 1 through May 1 and October 1 through November 15
- Bare root stock: December 15 through April 15
- Seeding: March 15 through October 15

B. *Erosion Control:* Grading, soil preparation, and seeding shall be performed during optimal weather conditions and at low flow levels to minimize sediment impacts. Site disturbance shall be minimized and desirable vegetation retained, where possible. Slopes shall be graded to support the establishment of vegetation. Where seeding is used for erosion control, an appropriate native grass, *Regreen* (or its equivalent), or sterile wheat shall be used to stabilize slopes until permanent vegetation is established. Biodegradable fabrics such as coir, coconut or approved jute matting (minimum ¼ inch square holes), may be used to stabilize slopes and channels. Fabrics such as burlap may be used to secure plant plugs in place and to discourage floating upon inundation. No plastic mesh that can entangle wildlife is permitted. Consult **Chapter 7** for additional information.

C. *Mulching:* Mulching for stormwater management facilities shall be per **Section A.4.7**.

D. *Plant Protection from Wildlife:* Depending on site conditions, appropriate measures shall be taken to limit wildlife-related damage.

E. *Irrigation:* Appropriate plant selection, along with adequate site preparation and maintenance, reduces the need for irrigation. However, unless site hydrology is currently adequate, a City approved irrigation system or equivalent shall be used during the 2-year plant establishment period. Watering shall be at a rate to maintain all plantings in a healthy thriving condition during establishment Other irrigation techniques, such as deep watering, may be allowed with prior approval by City staff.

F. *Access:* Maintenance access requirements are provided in **Chapter 4.**

Step 4: Monitoring and Maintenance

Determine plant monitoring and maintenance requirements.

A. *Monitoring:* Site visits are necessary throughout the growing season to assess the status of the plantings, irrigation, mulching, etc. and ensure successful plant establishment. The determination of a successful plant establishment period will be made by periodic plant establishment inspections. A successful planting establishment for each inspection is defined as:

- All plants are surviving and have vigorous growth.
- Plants are free of insects and disease.
- Plants show signs of continuing health.
- Plants have not reached permanent wilting point.

B. *Weed Control:* The removal of non-native, invasive weeds shall be necessary throughout the maintenance period, or until a healthy stand of desirable vegetation is established.

C. *Plant Replacement and Preservation:* At the end of the maintenance period all plants not in a healthy growing condition will be noted and as soon as seasonal conditions permit shall be removed from the site and replaced with plants of the same species and size as originally specified. Prior to replacement, the cause of loss (wildlife damage, poor plant stock, etc.) shall be documented with a description of the corrective actions taken.

Step 5: Construction Documents and Specifications

The construction documents and specifications shall include:

A. If applicable, *Sensitive Area* boundaries. Orange construction fencing shall be noted at buffer boundaries as well as at encroachment limits during construction.

B. Site preparation plan and specifications, including limits of clearing, existing plants and trees to be preserved, and methods for removal and control of invasive, non-native species, and location and depth of topsoil and/or compost to be added to planting area.

C. Planting plan and specifications, including all of the following:

- Planting table that documents the common name, scientific name, distribution (zone and spacing), condition and size of plantings
- Installation methods for plant materials
- Mulching
- Plant tagging for identification
- Plant protection
- Seeding mix, methods, rates, and areas

D. Irrigation plan and specifications, including identification of water source, and, maintenance of the system.

E. Maintenance schedule; including responsible party and contact information, dates of inspection (minimum three per growing season and one prior to onset of growing season) and estimated maintenance schedule (as necessary) over the 2-year monitoring period.

F. Access points for installation and maintenance including vehicle access if required.

G. Standard drawing details (north arrow, scale bar, property boundaries, project name, drawing date, name of designer and Property Owner).

A.4 Stormwater Management Facility Growing Medium

A soil analysis is required for the stormwater management facility growing medium for all public facilities and may be required for private facilities. A soil analysis is not required for single-family residential sites. The source of the growing medium must be identified in the construction documents.

Two blends of growing medium may be used for stormwater management facilities: Standard Blend for Public and Private Facilities and Irrigation Blend for the Right-of-Way. Growing media specifications shall conform to the following:

A.4.1 Standard Blend for Public and Private Facilities

Use this blend for all vegetated stormwater management facilities, except those in the right-of-way where compaction from foot traffic is a concern.

A. *General Composition*: The medium shall be a blend of loamy soil, sand, and compost that is 30 to 40 percent compost (by volume) and meets the criteria in this specification.

B. *Analysis Requirements for Blended Material:* A particle gradation analysis of the blended material, including compost, shall be conducted in conformance with ASTM C1 17/C136 (AASHTO T1 1/T27). The analysis shall include the following sieve sizes: 1 inch, 3/8 inch, #4, #10, #20, #40, #60, #100, and #200. The gradation of the blend shall meet the following gradation criteria.

Sieve size	Percent passing
1 inch	100
# 4	60 -100
# 10	40-100
# 40	15-50
# 100	5-25
# 200	3-5

The blend shall have a Coefficient of Uniformity (D60/D10) equal to or greater than 6 to ensure that it is well graded (has a broad range of particle sizes). The coefficient is the ratio of two particle diameters on a grain-size distribution curve; it is the particle diameter at 60 percent passing divided by the particle diameter at 10 percent passing.

C. *Organic Matter Content:* An analysis of soil organic matter content shall be conducted in conformance with ASTM D2974 (loss on ignition test). The soil organic matter content shall be a minimum of 10 percent, as reported by that test.

D. *pH:* The blended material shall be tested and have a pH of 5.5 to 7.

A.4.2 Infiltration Blend for the Right-of-Way

Use this blend for facilities in the right-of-way where compaction from foot traffic is a concern. Approval is required.

A. *General Composition:* The medium shall be a mix of sand and compost, blended by volume. The medium shall consist of 60 to 70 percent sand and 30 to 40 percent compost (by volume).

B. *Analysis Requirements:* The requirements are the same as those specified in **Section A.4.1.B** for the "Standard Blend for Public and Private Facilities." The single difference is the particle gradation criteria, which are as follows.

Sieve size	Percent passing
1 inch	100
# 4	60 -100
# 10	40-100
# 40	15-50
# 100	5-20
# 200	3-5

C. *Organic Matter Content:* An analysis of soil organic matter content shall be conducted in conformance with ASTM D2974 (loss on ignition test). The soil organic matter content shall be a minimum of 10 percent, as reported by that test.

D. *pH* The blended material shall be tested and have a pH of 5.5 to 7.

A.4.3 General Requirements for Blended Material

The applicant will be responsible for assuring that all of the following general requirements for the blended material are met and providing documentation when requested:

A. The material shall be loose and friable.

B. It shall be well mixed and homogenous.

C. It shall be free of wood pieces, plastic, screened and free of stones 1 inch (25 mm) or larger in any dimension; free of roots, plants, sod, clods, clay lumps, pockets of coarse sand, paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials harmful to plant growth; free of weeds and invasive plants including but not limited to:

1. *Cirsium arvense* (Canadian Thistle)
2. *Convolvulus spp*. (Morning Glory)
3. *Cytisus scoparus* (Scotch Broom)
4. *Dipsacus sylvestris* (Common Teasel)

5. *Festuca arundinaceae* (Tall Fescue)
6. *Hedera helix* (English Ivy)
7. *Holcus canatus* (Velvet Grass)
8. *Lolium spp*. (Rye Grasses)
9. *Lotus corniculatus* (Bird's Foot Trefoil)
10. *Lythrium salicaria* (Purple Loose Strife)
11. *Melilotus spp*. (Sweet Clover)
12. *Myriophyllum spicatum* (Eurasian Milfoil)
13. *Phalaris arundinaceae* (Reed Canary Grass)
14. *Rubus discolor* (Himalayan Blackberry)
15. *Solanum spp*. (Nightshade)
16. *Trifolium spp*. (Clovers), and

D. It shall not be infested with nematodes, grubs, other pests, pest eggs, or other undesirable organisms and disease-causing plant pathogens; friable and with sufficient structure to give good tilth and aeration.

E. Continuous, air-filled, pore-space content on a volume/volume basis shall be at least 15 percent when moisture is present at field capacity. Soil shall have a field capacity of at least 15 percent on a dry weight basis.

F. It shall have no visible free water.

G. It shall be obtained from naturally well drained construction or mining sites where topsoil occurs at least 4 inches deep; it shall not be obtained from bogs, wetlands, or marshes.

A.4.4 Compost

The compost shall be derived from plant material and provided by a member of the U.S. Composting Council Seal of Testing Assurance (STA) program. A list of local providers can be accessed at www.compostingcouncil.org.

The compost shall be the result of the biological degradation and transformation of plant- derived materials under conditions designed to promote aerobic decomposition. The material shall be well composted, free of viable weed seeds, and stable with regard to oxygen consumption and carbon dioxide generation. The compost shall have no visible free water and produce no dust when handled. It shall meet the following criteria, as reported by the U.S. Composting Council STA Compost Technical Data Sheet provided by the vendor.

A. 100 percent of the material must pass through a 1/2-inch screen.

B. The pH of the material shall be between 6 and 8.

C. Manufactured inert material (plastic, concrete, ceramics, metal, etc.) shall be less than 1.0 percent by weight.

D. The organic matter content shall be between 35 and 65 percent.

E. The soluble salt content shall be less than 6.0 mmhos/cm.

F. Germination (an indicator of maturity) shall be greater than 80 percent.

G. The stability shall be between classes 5-7.

H. The carbon/nitrogen ratio shall be less than 25:1.

I. The trace metals test result = "pass."

A.4.5 Documentation

The City requires the applicant to review and retain the following documentation for stormwater management facility growing medium. This documentation shall be submitted upon request.

A. Documentation for the analysis described in **Section A.4.1.B** of this specification (particle gradation with calculated coefficient of uniformity; organic matter content; pH). The analysis shall be performed by an accredited laboratory with certification maintained current. The date of the analysis shall be no more than 90 calendar days prior to the date of the submittal. The report shall include the following information:

- Name and address of the laboratory
- Phone contact and e-mail address for the laboratory
- Test data, including the date and name of the test procedure

B. A compost technical data sheet from the vendor of the compost. The analysis and report must be consistent with the sampling and reporting requirements of the U.S. Composting Council STA program. The analysis shall be performed and reported by an approved independent STA program laboratory.

- The date of the analysis shall be no more than 90 calendar days prior to the date of the submittal.
- A description of the location, equipment, and method proposed to mix the material.

A.4.6 Growing Medium Installation

A. *Protection of the Growing Medium:* The growing medium shall be protected from all sources of contamination, including weed seeds, while at the supplier, in conveyance, and at the project site.

B. *Placement of the Growing Medium:* The medium shall be placed in loose lifts, not to exceed 8 inches each and each lift shall be compacted with a water-filled landscape roller. The material shall not otherwise be mechanically compacted.

C. *Timing of Plant Installation:* Weather permitting, plants shall be installed as soon as possible after placing and grading the growing medium in order to minimize erosion and further compaction.

D. *Erosion Control:* Temporary erosion control measures are required until permanent stabilization measures are functional, including protection of overflow structures.

E. *Protection of the Facility:* In all cases, the facility must be protected from foot or equipment traffic that is unrelated to the construction of the facility. Temporary fencing or walkways should be installed as needed to keep workers, pedestrians, and equipment out of the facility. Under no circumstances should materials and equipment be stored in the facility.

F. *Wet and Winter Conditions:* Placement of the growing medium will not be allowed when the ground is frozen or saturated or when the weather is determined to be too wet.

A.4.7 Watering, Fertilizing, and Mulching

A. Water all plants during establishment to maintain all plantings in a healthy thriving condition.

B. Fertilizers should generally be avoided in stormwater management facilities. Fertilize all plants during establishment as needed with slow release, organic (low yield) material.

C. The purpose of mulching soils is to conserve moisture, hold plantings and topsoil in place, limit weed establishment and moderate soil temperatures.

D. Mulch for Vegetated Stormwater Management Facilities: The use of mulch in frequently inundated areas shall be limited, to avoid any possible water quality impacts including the leaching of tannins and nutrients, and the migration of mulch into waterways. Mulches to be used are a stable and inert (non-leaching) matter of sufficient mass and density that it will not float in standard flows. Mulch cover should be maintained throughout the life of the stormwater management facility with minimum thickness of 2 inches in depth.

A.5 Stormwater Management Facility Plant Lists

A.5.1 Selecting Plants

The plant lists provided in the following tables are separated by stormwater management facility type. Each facility list includes a suitability matrix for limiting contextual factors (such as moisture zones and width of facility) as well as a listing of specific characteristics for each species and the recommended on-center spacing. The species listed are representative examples and are not to be considered exclusive or exhaustive for these facility types. A comprehensive Native Plant Species List for planting within Oregon City can be found at the City's website. When a conflict exists between the representative species outlined within this publication and the Native Plant Species List, the Native Plant List will prevail.

No species adopted within the Oregon City Nuisance Plant List will be permitted.

The Native Plant List contains several native plants that are suggested as suitable for planting in and around stormwater management facilities. Select plant species suited to the expected hydrological conditions. Consider the maximum depth and duration of inundation, duration of saturation. Also, consider whether the site will dry out completely in the summer. The list includes the typical range of hydrological conditions under which the plants normally grow.

The following characteristics are included in plant matrices to aid in plant selection:

- **Botanical name, Common Name:** Plants are listed by their botanical name first, in italics, followed by a generally accepted common name. Note that common names vary, so use of the botanical name is recommended to ensure proper plant selection.

- **Zone:** Denotes the planting moisture zone as noted in the facility diagrams in **Figure A-1.** Some plants work in multiple moisture zones, and others only in a particular dry, moist, or wet condition.
- **Origin:** As described in **Section A.2.1**, the distinction between Northwest native plants, cultivated varieties of Northwest Natives, and plants that are non-native but adapted to our specific climate.
- **Type/Size**: A range of factors to aid in plant selection showing individual plant characteristics:
  - *(E)vergreen/(D)ecidious:* Identifies the characteristic of a plant to keep foliage during winter months. Planting placement and selection should maintain a balance of evergreen and deciduous materials.
  - *Potential Height:* Maximum size at maturity to use as a design guideline.
  - *On-Center Spacing:* Optimum spacing for new plantings. This is to be used as a guideline and may vary slightly depending on site conditions.
- Context Factors
  - *Facilities less than 3 feet wide:* Narrow conditions require plants that are not too large and will outgrow or have potential for roots to damage narrow planters.
  - *Fully Lined Facility:* Limit larger material or plants with aggressive roots
  - *Parking Area:* Use plant materials that do not limit necessary line of sight visibility.
  - *Streets:* Use plant materials that do not limit necessary line of sight visibility.
  - *Adjacent to Buildings:* Limit plants that are too large for areas next to buildings and would not be compatible with building footings, windows or other systems.

TABLE A-1: Representative Plant Lists: Stormwater Planters (Infiltration and Filtration)

Stormwater Planters (infiltration and filtration)		Zone	Origin			Type/Size			Context Factors					
Plant Name ***Botanical*, Common**	*Photo*	Moisture zone (A) Uniformly wet to moist	NW native	NW native cultivar	Non-native adapted	(E)vergreen /(D)eciduous	Potential height	Typical on center spacing	Facilities < 3 feet wide	Fully-lined facility	Parking areas	Streets	Adjacent to buildings	In buffer area
Herbaceous Plants														
Carex densa, Dense sedge		•	•			E	24"	12"	•	•	•	•	•	•
Carex rupestris, Curly sedge	x	•			•	D	14"	12"	•	•	•	•	•	
Carex testacea, New Zealand orange sedge		•			•	E	24"	12"	•	•	•	•	•	
Eleocharis ovata, Ovate spike rush		•	•			E	30"	12"	•	•	•	•	•	•
Juncus ensifolius, Dagger-leaf rush		•			•	D	10"	12"	•	•	•	•	•	
Juncus patens, Spreading rush	x	•	•			E	36"	12"	•	•	•	•	•	•
Shrubs/Groundcover														
Cornus sericea, Red twig dogwood		•	•			D	6'	4'			•		•	•
Cornus sericea 'Kelseyi', Kelsey dogwood		•		•		D	24"	24"	•	•	•	•	•	
Mahonia aquifolium, Oregon grape		•	•			E	5'	3'		•	•	•	•	•
Fragaria chiloensis, Coastal strawberry		•	•			E	6”	12”	•	•	•	•	•	•
Physocarpus capitatus, Pacific ninebark		•	•			D	10'	3'		•				•
Polystichum munitum, Sword fern	x	•	•			E	2'	2'	•	•	•	•	•	•
Rosa pisocarpa, Swamp rose		•	•			D	8'	3'		•			•	•
Large Shrubs/Small Trees														
Rubus spectabilis, Salmonberry		•	•			D	10'	4'		•			•	•
Salix lucida var. 'Lasiandra', Pacific willow		•		•		D	13'	6'						
Salix purpurea nana, Blue arctic willow		•			•	D	8'	6'			•			
Salix sitchensis, Sitka willow		•	•			D	20'	6'						•
Spirea douglasii, Douglas spiraea		•	•			D	7'	4'		•			•	•
Viburnum edule, Highbush cranberry		•	•			D	6'	4'		•	•	•		•
Trees														
Acer circinatum, Vine maple		•	•			D	15'	10'	•	•	•		•	•
Acer rubrum, Red maple		•			•	D	40'	25'		•	•	•		
Alnus rubra, Red alder		•	•			D	80'	15'			•			•
Crataegus douglasii, Black hawthorn		•	•			D	40'	10'		•	•			•
Fraxinus latifolia, Oregon ash		•	•			D	30'	20'			•			•
Malus fusca, Pacific crabapple		•	•			D	30'	10'	•	•	•			•
Nyssa sylvatica, Black tupelo		•			•	D	25'	20'			•	•		
Salix hookeriana, Hooker's willow		•	•			D	15'	10'			•			•
Thuja plicata, Western red cedar		•	•			E	150'	25'			•			•

TABLE A-2: Representative Plant Lists: Rain Gardens and Swales (Infiltration and Filtration)

Rain Gardens and Swales (infiltration and filtration)	Zone		Origin				Type/Size		Context Factors					
Plant Name ***Botanical*, common**	Moisture zone (A) Uniformly wet to moist	Moisture zone (B) Drier transitional area	NW native	NW native cultivar	Non-native adapted	Evergreen/Deciduous	Potential height	Typical on center spacing	Facilities < 3 feet wide	Fully-lined facility	Parking areas	Streets	Adjacent to buildings	In buffer area
Herbaceous Plants														
Carex obnupta, Slough sedge	•		•			E	48"	12"		•	•	•	•	•
Carex testacea, New Zealand orange sedge	•				•	D	24"	12"		•	•	•	•	
Deschampsia cespitosa, Tufted hair grass	•		•			D	36"	12"	•	•	•	•	•	•
Elymus glaucus, Blue wild rye	•	•	•			E	24"	12"	•	•	•	•	•	•
Juncus ensifolius, Dagger-leaf rush	•				•	D	10"	12"	•	•	•	•	•	
Juncus patens, Spreading rush	•	•			•	E	36"	12"	•	•	•	•	•	
Scirpus microcarpus, Small fruited bulrush	•		•			E	24"	12"	•	•	•	•	•	•
Small Shrubs/Groundcover														
Arctostaphylos uva-ursi, Kinnickinnick		•	•			E	6"	12"	•	•	•	•	•	•
Cornus sericea 'Kelseyi', Kelsey dogwood	•	•		•		D	2'	12"	•	•	•	•	•	
Fragaria chiloensis, Coastal strawberry		•	•			E	6"	12"	•	•	•	•	•	•
Mahonia aquifolium, Oregon grape	•	•	•			E	5'	3'		•	•	•	•	•
Physocarpus capitatus, Pacific ninebark	•		•			D	6'	3'		•				•
Polystichum munitum, Sword fern	•	•	•			E	2'	2'	•	•	•	•	•	•
Spirea betulifolia, Birchleaf spiraea	•	•	•			D	2'	2'	•	•	•	•	•	•
Symphoricarpus alba, Snowberry	•	•	•			D	3'	3'	•	•	•	•	•	•
Large Shrubs/Small Trees														
Cornus sericea, Red-Twig dogwood	•	•	•			D	6'	4'						•
Holodiscus discolor, Western serviceberry	•	•	•			D	6'	4'		•	•	•		•
Rosa nutkana, Nootka rose	•	•	•			D	8'	4'		•		•		•
Omleria cerasiformis, Indian plum	•		•			D	6'	4'		•	•	•		•
Ribes sanguimeum, Red flowering currant	•	•	•			D	8'	4'		•	•	•	•	•
Salix sitchensis, Sitka willow	•		•			D	15'	5'						•
Spirea douglasii, Douglas spiraea		•	•			D	7'	4'		•	•	•	•	•
Trees														
Acer circinatum, Vine maple	•	•	•			D	15'	8'	•	•	•	•	•	•
Alnus rubra, Red alder	•	•	•			D	80'	20'					•	•
Cornus nuttalii, Pacific dogwood	•	•	•			D	20'	10'	•	•	•	•	•	•
Fraxinus latifolia, Oregon ash	•		•			D	30'	25'						•
Malus fusca, Pacific crabapple	•		•			D	30'	10'	•	•			•	•
Pseudotsuga menziesii, Douglas fir	•	•	•			E	200'	30'						•
Thuja plicata, Western red cedar	•	•	•			E	150'	20'			•			•

TABLE A-3: Representative Plant Lists: Ponds

Ponds	Zone			Origin				Type/Size		Context Factors					
Plant Name ***Botanical*, common**	Moisture zone (S) Saturated/permanent pool	Moisture zone (A) Uniformly wet to moist	Moisture Zone (B) Drier transitional area	NW native	NW native cultivar	Non-native adapted	(E)vergreen/(D)eciduous	Potential height	Typical on center spacing	Facilities < 3 feet wide	Fully -lined facility	Parking areas	Streets	Adjacent to buildings	In buffer area
Herbaceous Plants															
Alisma plantago-aquatica, Water plantain	•			•			D	24"	12"	•	•				•
Camassia quamash, Camas lily		•	•	•			D	24"	12"	•	•	•	•	•	•
Carex obnupta, Slough sedge	•	•		•			E	48"	12"		•	•	•	•	•
Deschampsia cespitosa, Tufted hair grass		•		•			D	36"	12"	•	•	•	•	•	•
Eleocharis ovata, Ovate spike rush	•			•			E	30"	12"	•	•				•
Elymus glaucus, Blue wild rye		•	•	•			E	24"	12"	•	•	•	•	•	•
Juncus ensifolius, Dagger-leaf rush	•	•				•	D	10"	12"	•	•	•	•	•	
Juncus patens, Spreading rush	•	•	•			•	E	36"	12"	•	•	•	•	•	
Sagittaria latifolia, Wapato	•			•			D	24"	12"	•	•				•
Scirpus acutus, Hardstem bulrush	•					•	D	10"	12"	•	•				
Scirpus microcarpus, Small fruited bulrush	•	•		•			E	24"	12"	•	•	•	•	•	•
Veronica liwanensis, Speedwell		•				•	D	2"	12"	•	•	•	•	•	
Small Shrubs/Groundcover															
Cornus sericea 'Kelseyi', Kelsey dogwood	•	•	•		•		D	2'	1'	•	•	•	•	•	•
Mahonia aquifolium, Oregon grape		•	•	•			E	5'	3'		•	•	•	•	•
Physocarpus capitatus, Pacific ninebark	•	•		•			D	6'	3'		•				•
Polystichum munitum, Sword fern		•	•	•			E	2'	2'	•	•	•	•	•	•
Spirea betulifolia, Birchleaf spiraea		•	•	•			D	2'	2'	•	•	•	•	•	•
Smphoricarpus alba, Snowberry		•	•	•			D	3'	3'	•	•	•	•	•	•
Large Shrubs/Small Trees															
Cornus sericea, Red-Twig Dogwood	•	•	•	•			D	6'	4'						•
Holodiscus discolor, Western serviceberry		•	•	•			D	6'	4'		•	•	•		•
Rosa nutkana, Nootka rose		•	•	•			D	8'	4'		•		•		•
Omleria cerasiformis, Indian plum		•		•			D	6'	4'		•	•	•		•
Ribes sanguimeum, Red flowering currant		•	•	•			D	8'	4'		•	•	•	•	•
Salix sitchensis, Sitka willow	•	•		•			D	15'	5'						•
Spirea douglasii, Douglas Spiraea			•	•			D	7'	4'		•	•	•	•	•
Ceanothus velutinus, Snowbrush		•	•	•			E	6'	3'		•	•	•	•	•

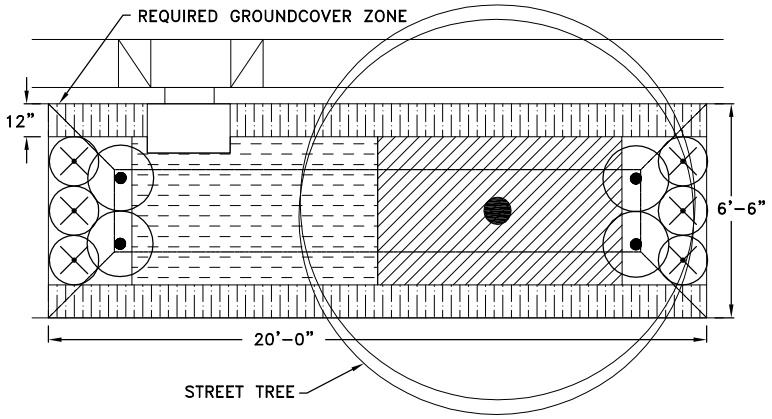
TABLE A-3: Representative Plant Lists: Ponds

Ponds	Zone			Origin				Type/Size		Context Factors					
Plant Name ***Botanical*, common**	Moisture zone (S) Saturated/permanent pool	Moisture zone (A) Uniformly wet to moist	Moisture Zone (B) Drier transitional area	NW native	NW native cultivar	Non-native adapted	(E)vergreen/(D)eciduous	Potential height	Typical on center spacing	Facilities < 3 feet wide	Fully -lined facility	Parking areas	Streets	Adjacent to buildings	In buffer area
Trees															
Acer circinatum, Vine maple		•	•	•			D	15'	8'	•	•	•	•	•	•
Acer rubrum, Red Maple	•	•	•			•	D	40'	25'		•	•	•		
Alnus rubra, Red alder	•			•			D	80'	20'					•	•
Cornus nuttalii, Pacific Dogwood		•	•	•			D	20'	10'	•	•	•	•	•	•
Fraxinus latifolia, Oregon Ash	•	•		•			D	30'	25'						•
Malus fusca, Pacific Crabapple	•	•		•			D	30'	10'	•	•			•	•
Pseudotsuga menziesii, Douglas fir		•	•	•			E	200'	30'						•
Thuja plicata, Western red cedar	•	•	•	•			E	150'	20'			•			•

TABLE A-4: Representative Plant Lists: Green Roofs

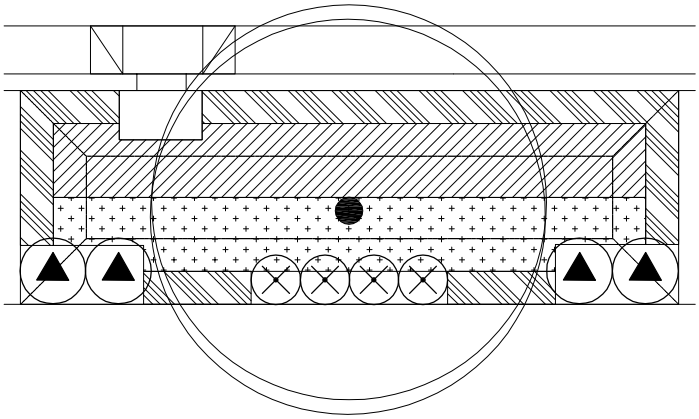
Green Roofs	Zone		Origin				Type/Size	
Plant Name ***Botanical*, common**	Moisture Zone (C) Extensive Ecoroof	Moisture zone (D) Intensive Roof Garden	NW native	NW native cultivar	Non-native adapted	(E)vergreen/(D)eciduous	Potential height	Typical on center spacing
Sedums and Succulents								
Delosperma ssp., Ice plant	•	•			•	E	4"	6-12"
Malephora crocea v. purpureo, Coppery mesemb	•	•			•	E	10"	6-12"
Sedum acre, Biting stonecrop	•				•	E	2"	6-12"
Sedum album, White stonecrop	•				•	E	3"	6-12"
Sedum divergens, Pacific stonecrop	•				•	E	3"	6-12"
Sedum hispanicum, Spanish stonecrop	•				•	E	3"	6-12"
Sedum kamtschaticum, Kirin-so	•	•			•	D	6"	6-12"
Sedum oreganum, Oregon stonecrop	•	•	•			E	4"	6-12"
Sedum sexangulare, Tasteless stonecrop	•	•			•	E	4"	6-12"
Sedum spathufolium, Stonecrop	•	•			•	E	4"	6-12"
Sedum spurium, Two-row stonecrop	•	•			•	E	6"	6-12"
Sempervivum tectorum, Hens and chicks	•				•	E	3"	6-12"
Herbaceous Plants								
Achillea millefolium, Common yarrow	•	•			•	D	24"	24"
Artemesia 'Silver Mound', Artemesia	•	•			•	D	12"	12"
Castilleja foliosa, Indian paintbrush	•	•	•			D	10"	12"
Dianthus ssp., Dianthus	•				•	D	12"	12"
Erigeron discoideus, Fleabane	•				•	D	12"	12"
Festuca glauca 'Elijah's Blue', Elijah's blue fescue	•	•			•	E	12"	12"
Fragaria chiloensis, Coastal strawberry	•	•	•			E	6"	12"
Gilia capitata, Blue thimble flower	•		•			D	12"	12"
Lobularia maritima, Sweet alyssum	•				•	D	12"	12"
Polystichum munitum, Sword fern	•	•	•			E	24"	24"
Thymus serphyllum, Creeping thyme	•				•	D	3"	6"
Veronica liwanensis, Speedwell	•				•	D	2"	6"

PLANT DIAGRAM AND LEGEND 1



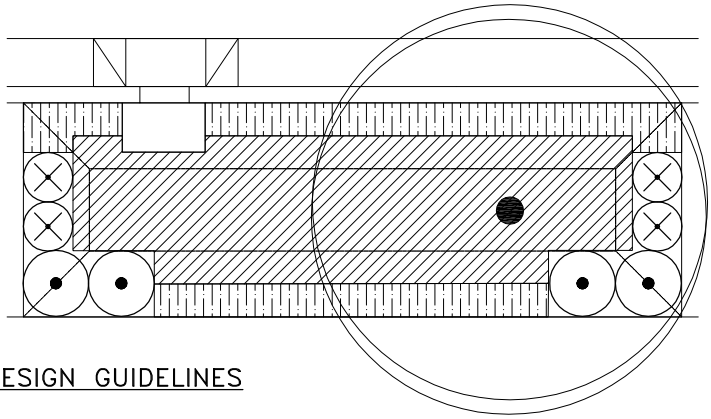
Symbol	Botanical name COMMON NAME	E/D	O.C.	QTY
ZONE A				
	Carex rupestris CURLY SEDGE	E	12"	32
	Juncus patens SPREADING RUSH	E	12"	33
	Spirea douglasii DOUGLAS SPIRAEA	D	24"	4
ZONE B				
	Fragaria chiloensis COASTAL STRAWBERRY	E	12"	37
	Mahonia aquifolium OREGON GRAPE	E	18"	6

PLANT DIAGRAM AND LEGEND 2



Symbol	Botanical name COMMON NAME	E/D	O.C.	QTY
ZONE A				
	Carex densa DENSE SEDGE	E	12"	36
	Juncus patens SPREADING RUSH	E	12"	39
ZONE B				
	Rubus spectabilis SALMONBERRY	E	18"	31
	Mahonia aquifolium OREGON GRAPE	E	18"	4
	Rosa pisocarpa SWAMP ROSE	D	24"	4

PLANT DIAGRAM AND LEGEND 3



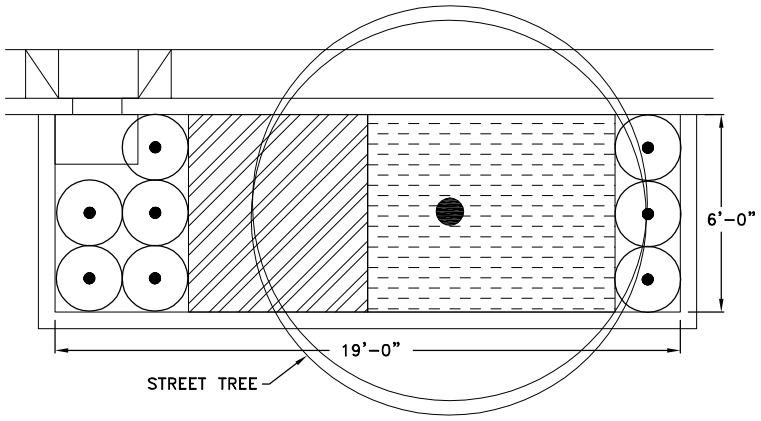
Symbol	Botanical name COMMON NAME	E/D	O.C.	QTY
ZONE A				
	Juncus patens SPREADING RUSH	E	12"	38
ZONE B				
	Fragaria chiloensis COASTAL STRAWBERRY	E	12"	19
	Mahonia aquifolium OREGON GRAPE	E	18"	4
	Spirea douglasii DOUGLAS SPIRAEA	D	24"	4

DESIGN GUIDELINES

1. These are example planting diagrams provided by the City of Oregon City. Choose a planting diagram and alter it to your design. Other planting designs may be approved.
2. See Table A–1 for typical plant spacing and design considerations.
3. Planting legends shown here do not include all required information for landscape plans.

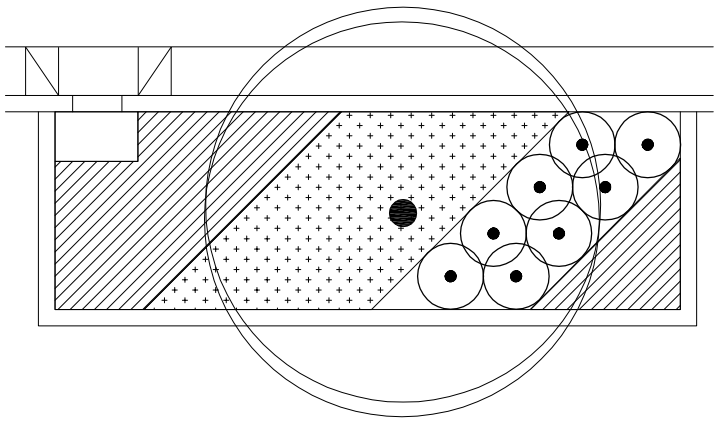
Rain Garden Example Planting Diagram
Figure A–1

PLANT DIAGRAM AND LEGEND 1



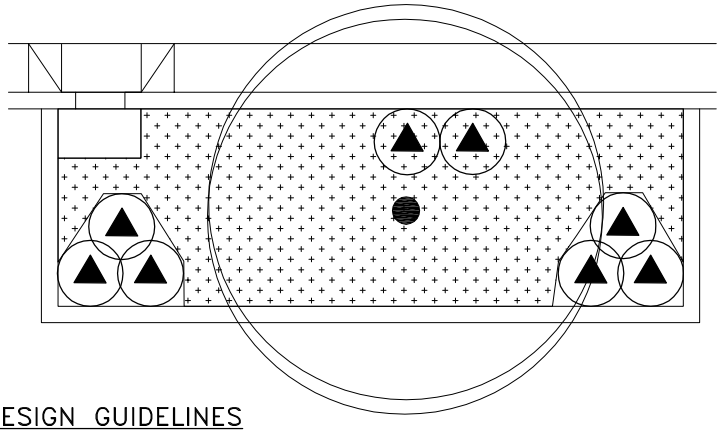
Symbol	Botanical name COMMON NAME	E/D	O.C.	QTY
	Carex ruperstris CURLY SEDGE	E	12"	45
	Juncus ensifolius DAGGER-LEAF RUSH	D	12"	33
	Cornus sericea 'Kelseyi' KELSEY DOGWOOD	D	24"	8

PLANT DIAGRAM AND LEGEND 2



Symbol	Botanical name COMMON NAME	E/D	O.C.	QTY
	Carex densa DENSE SEDGE	E	12"	43
	Juncus patens SPREADING RUSH	D	12"	40
	Cornus sericea 'Kelseyi' KELSEY DOGWOOD	D	24"	8

PLANT DIAGRAM AND LEGEND 3



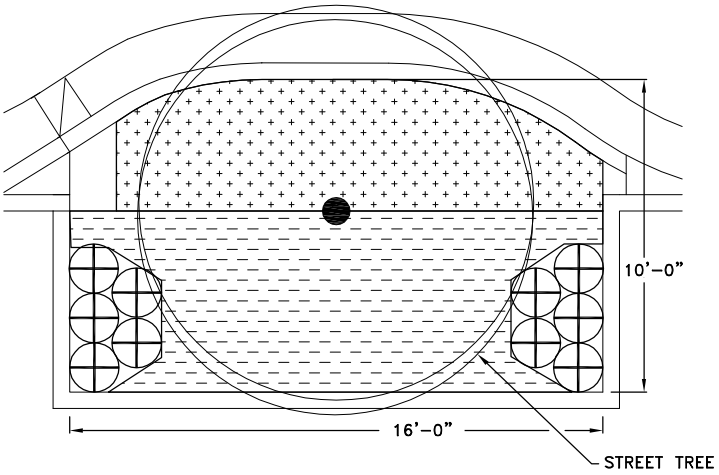
Symbol	Botanical name COMMON NAME	E/D	O.C.	QTY
	Carex densa DENSE SEDGE	E	12"	56
	Rosa pisocarpa SWAMP ROSE	D	24"	8

DESIGN GUIDELINES

1. These are example planting diagrams provided by the City of Oregon City. Choose a planting diagram and alter it to your design. Other planting designs may be approved.
2. See Table A-1 for typical plant spacing and design considerations.
3. Planting legends shown here do not include all required information for landscape plans.

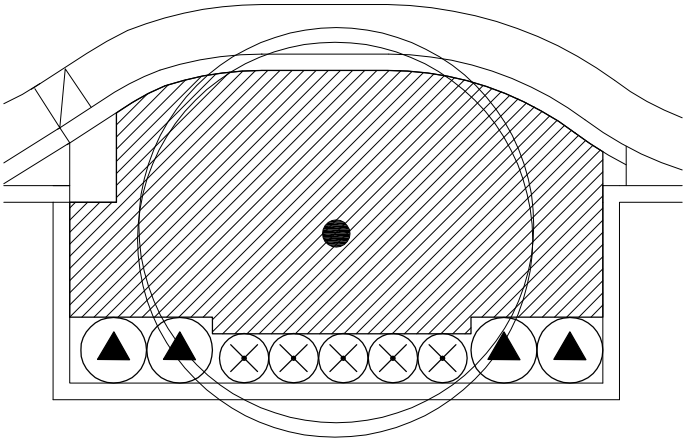
Stormwater Planter Example Planting Diagram
Figure A-2

PLANT DIAGRAM AND LEGEND 1



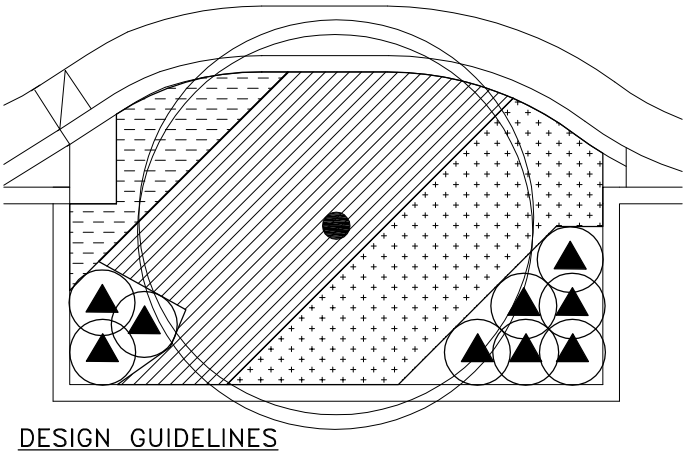
Symbol	Botanical name COMMON NAME	E/D	O.C.	QTY
	Carex rupestris CURLY SEDGE	E	12"	68
	Carex densa DENSE SEDGE	D	12"	52
	Spirea douglasii DOUGLAS SPIRAEA	D	18"	10

PLANT DIAGRAM AND LEGEND 2



Symbol	Botanical name COMMON NAME	E/D	O.C.	QTY
	Juncus patens SPREADING RUSH	E	12"	68
	Mahonia aquifolium OREGON GRAPE	E	18"	5
	Rosa pisocarpa SWAMP ROSE	D	24"	4

PLANT DIAGRAM AND LEGEND 3

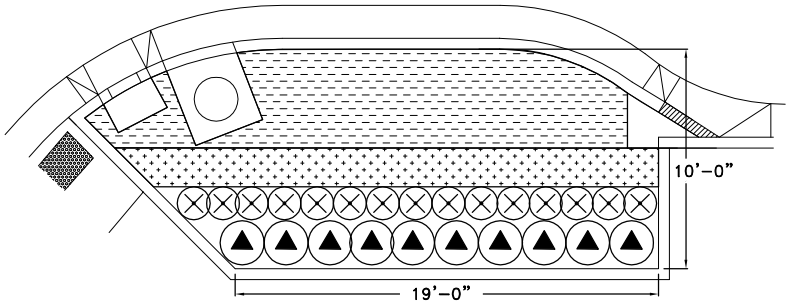


Symbol	Botanical name COMMON NAME	E/D	O.C.	QTY
	Carex rupestris CURLY SEDGE	E	12"	15
	Carex densa DENSE SEDGE	E	12"	41
	Juncus patens SPREADING RUSH	E	12"	59
	Rosa pisocarpa SWAMP ROSE	D	24"	9

DESIGN GUIDELINES

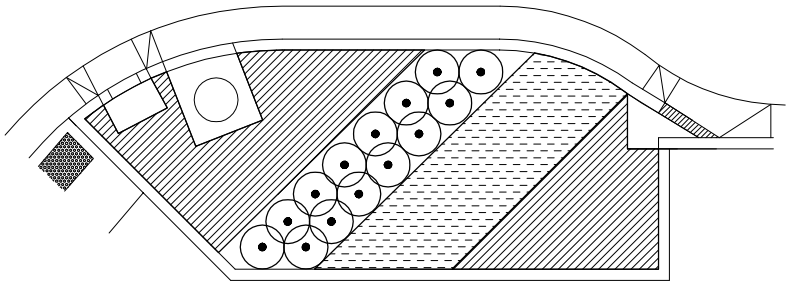
1. These are example planting diagrams provided by the City of Oregon City. Choose a planting diagram and alter it to your design. Other planting designs may be approved.
2. See Table A-1 for typical plant spacing and design considerations.
3. Planting legends shown here do not include all required information for landscape plans.

PLANT DIAGRAM AND LEGEND 1



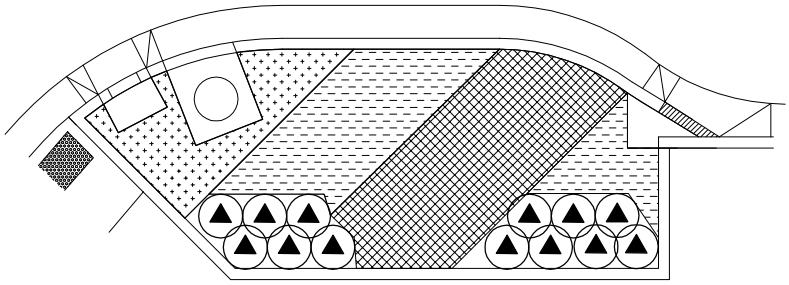
Symbol	Botanical name COMMON NAME	E/D	O.C.	QTY
	Carex rupestris CURLY SEDGE	E	12"	82
	Carex densa DENSE SEDGE	E	12"	42
⊗	Mahonia aquifolium OREGON GRAPE	E	18"	15
▲	Rosa pisocarpa SWAMP ROSE	D	24"	10

PLANT DIAGRAM AND LEGEND 2



Symbol	Botanical name COMMON NAME	E/D	O.C.	QTY
	Carex rupestris CURLY SEDGE	E	12"	56
	Juncus patens SPREADING RUSH	E	12"	96
●	Cornus sericea 'Kelseyi' KELSEY DOGWOOD	D	24"	14

PLANT DIAGRAM AND LEGEND 3



Symbol	Botanical name COMMON NAME	E/D	O.C.	QTY
	Carex rupestris CURLY SEDGE	E	12"	58
	Carex densa DENSE SEDGE	E	12"	30
	Carex testacea NEW ZEALAND ORANGE SEDGE	E	12"	68
▲	Rosa pisocarpa SWAMP ROSE	D	24"	13

DESIGN GUIDELINES

1. These are example planting diagrams provided by the City of Oregon City. Choose a planting diagram and alter it to your design. Other planting designs may be approved.
2. See Table A–1 for typical plant spacing and design considerations.
3. Planting legends shown here do not include all required information for landscape plans.

APPENDIX B

Site Assessment and Planning Checklist

SITE ASSESSMENT AND PLANNING CHECKLIST		
✓	**Information needed**	**Attach supporting materials as needed**
2.2.1 Site Information		
	Applicant contact information	Applicant name: _____ Business name: _____ Contact address, phone number, and e-mail: _____ _____ _____
	Project location	Site address: _____ Site description: _____ _____ _____ Major drainage basin: _____ Is the project site located with the WQRA as defined in OCMC 17.49? _____ (Y/N) *Include a vicinity map of the site (including location of property in relation to adjacent properties, roads, and pedestrian/bike facilities).*
	Project type	Identify types of development planned for the site such as commercial, industrial, single-family residential, multi-family residential, or other (describe):
	Size of site	Size of site: _____ (acres) Number of existing/proposed tax lots: _____ Amount of new and replaced impervious area: _____ (SF)
2.2.2 Site Assessment *Note: Site assessment information may be available from the OCMaps online tool available through the City's website.*		
	Site Assessment Map	*Attach engineered scale Site Assessment Map, showing items below.*
	Topography Evaluate site and map slopes: *Flat: 0-10%* *Moderate: 10-25%* *Steep: 25% and greater*	*Surveyed or aerial-based mapping with 2-foot intervals for slopes 0-25% slope and 10-foot intervals for steeper. Indicate Geologic Hazard Areas as defined by OCMC 17.04.510 and Geologic Hazards Overlay Zone as defined by OCMC 17.04.515.*
	Soils and Groundwater Research and map site soil hydrologic group, depth to groundwater	NRCS Hydrologic Soil Type (show on map if more than one type present): *Attach seasonal groundwater depth evaluation if available or required (site has floodplain and/or wetland). Groundwater depth information is available from the City.*
	Infiltration Assessment Determine soil capacity for onsite infiltration	If an infiltration test is performed, attach the documentation. Report the test type (Basic/Professional) performed and results. See **Appendix D** for the approved infiltration testing methods. Test type: _____ _____ (inches/hour)

SITE ASSESSMENT AND PLANNING CHECKLIST		
	Hydrology – Conditions and Natural Features Map site floodplains, wetlands, streams, and location of outfalls	Clearly label on map all intermittent and perennial creeks/streams/rivers and wetlands, FEMA floodplains, and existing drainage systems (pipes, ditches, outfalls). Check here if present on site: _____ Sensitive area(s) _____ Floodplain _____
	Downstream Conveyance	Indicate the proposed point of discharge on the site plan. *Prepare and attach a Downstream Analysis as required by **Chapter 5**.* Check here to verify that adequate downstream capacity is available: _____
	Existing Vegetation Map trees and vegetation	Using aerial photos or survey, map all trees and vegetation. Note all existing trees 6-inch caliper and greater (DBH) on map. Delineate and identify other areas and types of existing vegetation. The local planning authority may require a formal tree survey.
	Required Vegetated Buffers and Setbacks Assess and map buffers	Identify required vegetated buffer areas and other setback limits as defined by OCMC Title 17.
	Land Use and Zoning	Existing Land Use Zoning designation(s): _____
	Access and Parking	Delineate proposed access points for all transportation modes on map. Indicate amount and area of required parking onsite if applicable, *attach documentation as needed.*
	Utilities to Site and Surrounding Area	Map existing utilities including stormwater facilities, storm conveyance, sewer, water, electricity, phone/cable, gas, and any public storm system/facility downstream.
2.2.3 Site Planning Design Objectives *(attach engineered scale Preliminary Site Plan)*		
	1. Preserve existing resources	**Required:** Show sensitive areas and buffers on site plan. Denote buffer areas that require enhancement. Show any proposed areas of encroachment and associated buffer mitigation areas.
	2. Minimize site disturbance	**Required:** Delineate protection areas on site plan for areas to remain undisturbed during construction.
	3. Minimize soil compaction	**Required:** Delineate and note temporary fencing on site plan for proposed infiltration facilities, vegetated stormwater management facilities, and re-vegetation areas.
	4. Minimize imperviousness	**Required:** Delineate proposed impervious areas and proposed impervious area reduction methods on the site plan. A. Total proposed new/replaced impervious area: _____ (SF) B. Area of proposed Green Roofs: _____ (SF) C. Area of proposed pervious pavements: _____ (SF) D. Describe type of pavers or pavement proposed: _____ _____ E. Impervious area requiring management [A-(B+C)]: _____ (SF)

SITE ASSESSMENT AND PLANNING CHECKLIST

2.2.4 Proposed Stormwater Management Strategy

	Proposed Stormwater Management Strategy	_____ Infiltration facilities _____ Surface Infiltration facilities to the MEP _____ Full onsite retention/infiltration up to the 10-year storm event _____ Infiltration facilities are limited by the following conditions *(include documentation to demonstrate the limiting condition and choose an alternate strategy below):* _____ Stormwater management facility to be located on fill _____ Steep slopes _____ High groundwater _____ Contaminated soils _____ Conflict with required Source Controls (**Chapter 6**) _____ Onsite Stormwater management facilities (indicate below) _____ Offsite stormwater management facilities/regional facilities _____ Fee in Lieu, as determined by the City
	Preliminary Facility Selection/Sizing	Check all that apply, *attach output from BMP Sizing Tool*, and show proposed Stormwater Management Facilities on Preliminary Site Plan. LID facilities: _____ Infiltration Stormwater Planter _____ Filtration Stormwater Planter _____ Infiltration Rain Garden _____ Filtration Rain Garden _____ Vegetated Swale _____ Detention Pond _____ Infiltration Trench _____ Manufactured Treatment Technology _____ Other: _____
	Verify Minimum Facility Size	A. Required surface area of onsite surface infiltration facilities: As determined by BMP sizing tool or engineered method: _____ (SF) B. Calculate MEP surface area of surface infiltration facilities for sites with limiting conditions: Total new/replaced impervious area (SF) x 0.10 = _____ (SF) C. Calculate required surface area of onsite LID facilities: Smaller of [A] or [B]: _____ (SF) D. Proposed surface infiltration facility size(s): From site plan: _____ (SF) *must be larger than [C]*

SITE ASSESSMENT AND PLANNING CHECKLIST		
2.2.5 Other Project Requirements		
	Grading Permit	Review OCMC 15.48 to determine whether a grading permit will be required. Grading permit required? _____ (Y/N) Type of Grading Plan proposed (see **Chapter 3**): _____
	Erosion Prevention and Sediment Control	Identify the required permits: _____ ESC Permit from the City *(sites that include 1,000+ SF new or replaced impervious area)* _____ 1200-C Permit from DEQ *(sites that disturb 1 acre or more land surface)*
	Source Control for High Use Sites	Identify whether the proposed development will include any of the following: _____ Fuel Dispensing Facilities and Surrounding Traffic Areas _____ Above-Ground Storage of Liquid Materials _____ Solid Waste Storage Areas, Containers, and Trash Compactors _____ Exterior Storage of Bulk Materials _____ Material Transfer Areas/Loading Docks _____ Equipment and/or Vehicle Washing Facilities _____ Development on Land With Suspected or Known Contamination _____ Covered Vehicle Parking Areas _____ Industrial and Commercial High Traffic Areas _____ Other land uses subject to the ODEQ 1200-Z Industrial Stormwater Permit
	Other Permits	Identify other natural resources related permits from local, state, or federal agencies that may be required as part of the proposed development activity. It is the responsibility of the applicant to identify and obtain required permits prior to project approval. List other anticipated permits:

APPENDIX C

Stormwater Facility Design and Maintenance

APPENDIX C. STORMWATER FACILITY DESIGN AND MAINTENANCE

This appendix includes fact sheets, design guideline drawings, and operation and maintenance (O&M) plans for the stormwater management facilities accepted by the City of Oregon City (City). Fact sheets include example photos and concept sketches to illustrate the general appearance and potential use for the stormwater management facilities. The images have been excerpted from the 2009 Clean Water Services LIDA Handbook and are intended to help in the selection of appropriate facilities for preliminary site design.

The facility drawings show minimum facility dimensions, cross sections, and design criteria. These drawings are for reference only. The project engineer must provide facility-specific construction documents with plan views, cross sections, and control structure details for each proposed stormwater management facility. Refer to the City's standard drawings and engineering policy for standard details, applicable for use in construction documents.

This appendix also includes sample O&M plans for typical stormwater management facilities. The O&M plans should be modified as necessary to reflect specific site conditions and facility design before inclusion in the stormwater management plan.

The following figures are included in this appendix:

- Figure C-1. Stormwater Planter – Filtration
- Figure C-2. Stormwater Planter – Infiltration
- Figure C-3. Stormwater Planter O&M Plan
- Figure C-4. Rain Garden – Filtration
- Figure C-5. Rain Garden – Infiltration
- Figure C-6. Rain Garden O&M Plan
- Figure C-7. Vegetated Swale – Filtration
- Figure C-8. Vegetated Swale – Infiltration
- Figure C-9. Vegetated Swale O&M Plan
- Figure C-10. Planter, Rain Garden, and Swale Flow Control Structure
- Figure C-11. Detention Pond
- Figure C-12. Detention Pond Flow Control Structure
- Figure C-13. Detention Pond O&M Plan
- Figure C-14. Roof Infiltration System
- Figure C-15. Roof Infiltration System O&M Plan
- Figure C-16. Pervious Pavement
- Figure C-17. Pervious Pavement O&M Plan
- Figure C-18. Green Roof
- Figure C-19. Green Roof O&M Plan
- Figure C-20. Stormwater Facilities O&M Checklist

Rain Gardens and Stormwater Planters

Rain gardens and Stormwater Planters have similar design guidelines and potential benefits. Stormwater Planters are rain gardens with vertical walls, which may be more appropriate in urban site design or for facilities located adjacent to sidewalks, roadways, or buildings.



RAIN GARDENS

Rain gardens are planted open depressions designed to accept runoff from adjacent impervious surfaces. Rain gardens trap and treat pollutants by filtering it through topsoil as the water infiltrates into native soils or underlying drain pipes. Most rain gardens must be designed to infiltrate the stormwater they receive. An underdrain and overflow device may be required to accomodate flows greater that the infiltration capacity of the underlying soils, or if a liner is required.

Benefits

- Rain gardens may help fulfill a site's landscaping area requirement and can be used to treat stormwater from all types of impervious surfaces including private property and the public right-of-way, rooftops, parking lots, and streets.
- Rain gardens reduce stormwater flow rates, volume, and temperature, and improve water quality. Pollutants are removed as the runoff passes through the soil layer and is collected in an underlying layer of gravel or drain rock.
- Detention storage volume can be built into the underlying drain rock layer.

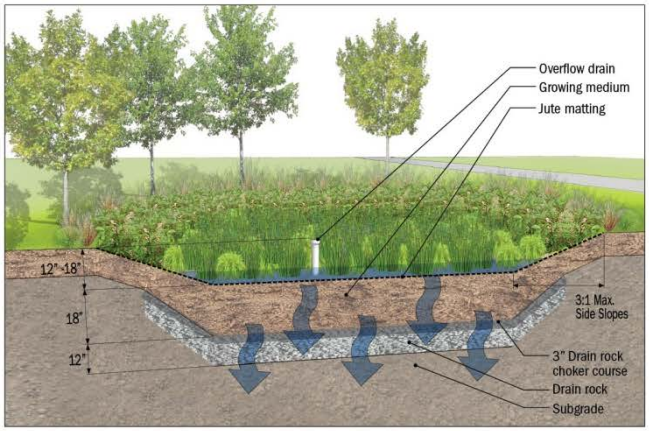


Image from Clean Water Services LIDA Handbook

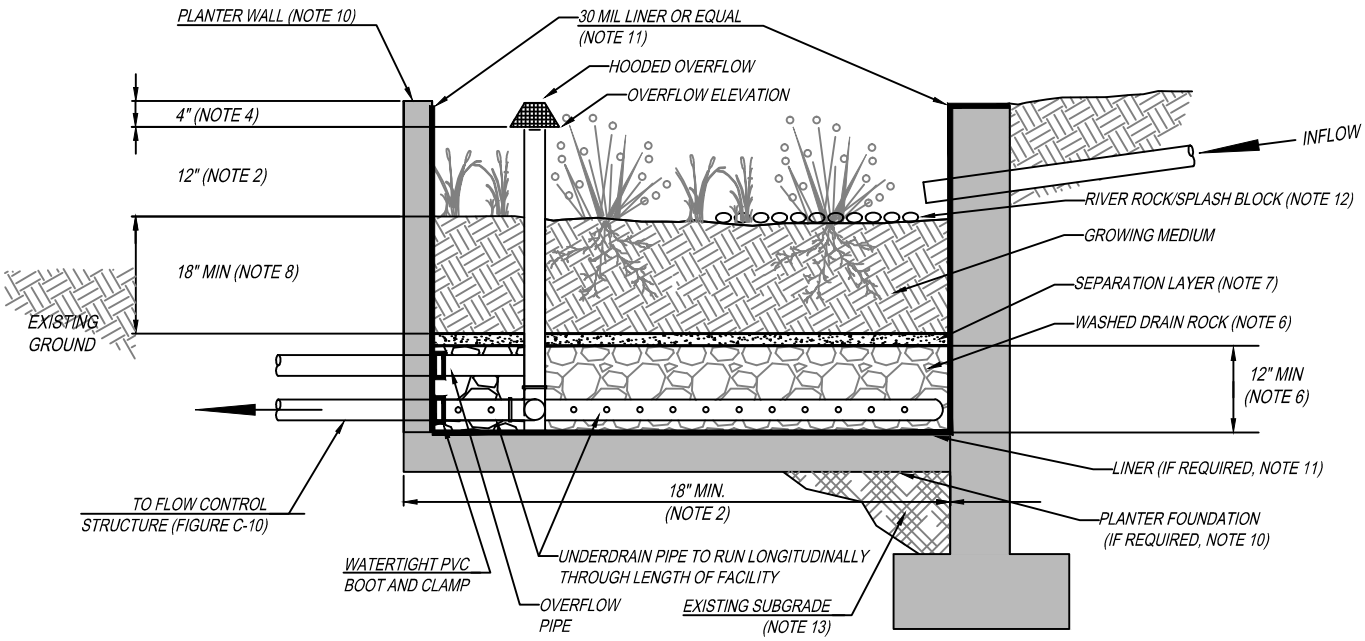


Buckman Terrace Apartments, Portland



Beaumont Village Lofts, NE Portland

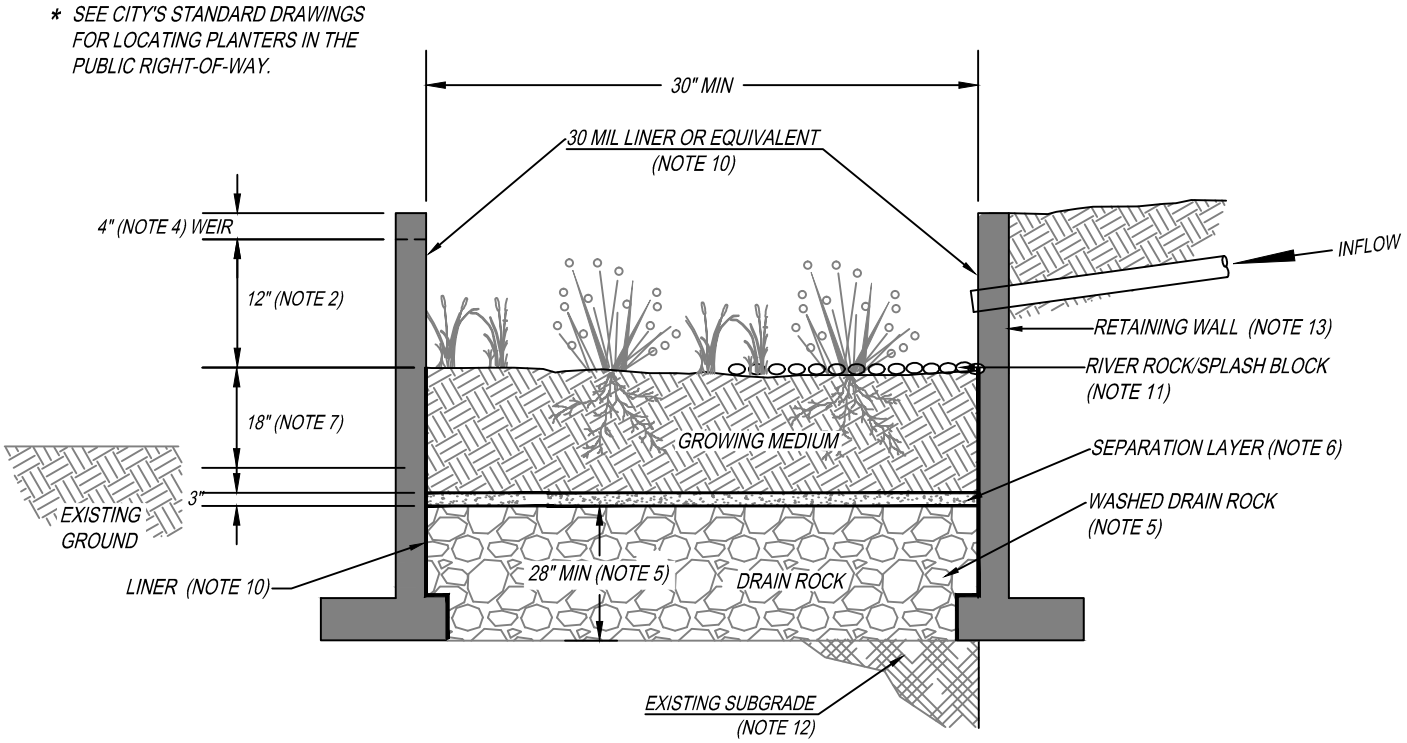
* SEE CITY'S STANDARD DRAWINGS FOR LOCATING PLANTERS IN THE PUBLIC RIGHT-OF-WAY.



GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION.
2. **DIMENSIONS:**
   -WIDTH: 18" MINIMUM
   -DEPTH OF PLANTER (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 12"
   -SLOPE OF PLANTER: 0.5% OR LESS
3. **SETBACKS**
   -PLANTERS MUST BE MINIMUM OF 5 FEET FROM PROPERTY LINE.
4. **OVERFLOW:**
   -INLET ELEVATION MUST ALLOW FOR 4" OF FREEBOARD, MINIMUM.
   -PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE.
5. **PIPING:**
   -PERFORATED UNDERDRAIN PIPING: SHALL BE ABS SCH. 40, DUCTILE IRON, OR PVC SCH.40, 6" MINIMUM DIAMETER. PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
   -OVERFLOW PIPING: SHALL BE ABS SCH.40, DUCTILE IRON, OR PVC SCH.40 AND SHALL NOT BE PERFORATED. MIMIMUM DIAMETER IS 6". PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
6. **DRAIN ROCK:**
   -SIZE FOR FLOW-THROUGH PLANTER: 1 1/2" - 3/4" WASHED
   -DEPTH: 12" MINIMUM
7. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
8. **GROWING MEDIUM:**
   -DEPTH: 18" MINIMUM
   -SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
   -FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
9. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
10. **PLANTER FOUNDATION AND WALLS:**
    -MATERIALS SHALL BE 4" REINFORCED CONCRETE, STONE, BRICK, OR OTHER DURABLE MATERIAL.
    -CONCRETE, BRICK, OR STONE WALLS SHALL BE INCLUDED ON FOUNDATION PLANS.
    -INSTALL INVERTED CURB AS NEEDED BETWEEN PLANTER AND ROAD SUBGRADE.
    -WALL HEIGHTS GREATER THAN 24" ABOVE GRADE REQUIRE HANDRAIL.
11. **WATERPROOF LINER (IF REQUIRED):**
    -LINER SHALL BE 30 MIL PVC OR EQUIVALENT, FOR FLOW THROUGH FACILITIES.
    -A WATERPROOF LINER IS NOT REQUIRED IF THE FOUNDATION OR WALL MATERIAL IS WATERPROOF REINFORCED CONCRETE OR APPROVED EQUAL.
12. **INSTALL RIVER ROCK** SPLASH PAD TO TRANSITION FROM INLET TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" - 3".
13. **SEASONAL HIGH GROUNDWATER SEPARATION:**
    -SEPARATION DISTANCE AS REQUIRED BY THE CITY.
14. **SUBMIT RETAINING WALL DESIGN** IN ACCORDANCE WITH APPLICABLE STRUCTURAL CODES FOR REVIEW AND APPROVAL.

Stormwater Planter - Filtration
Figure C-1



GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION.
2. **DIMENSIONS:**
   -WIDTH: 30" MINIMUM
   -DEPTH OF PLANTER (FROM TOP OF GROWING MEDIUM TO OVERFLOW WEIR ELEVATION): 12"
   -SLOPE OF PLANTER: 0.5% OR LESS
3. **SETBACKS:**
   -PLANTERS MUST BE MINIMUM OF 5 FEET FROM PROPERTY LINE.
4. **OVERFLOW:**
   -WEIR ELEVATION MUST ALLOW FOR 4" OF FREEBOARD, MINIMUM.
   -SIZE OVERFLOW WEIR FOR THE 100 YEAR DESIGN STORM. IDENTIFY EMERGENCY OVERFLOW ROUTE ON THE STORMWATER MANAGEMENT PLAN.
5. **DRAIN ROCK:**
   -SIZE: 1 1/2" - 3/4" WASHED
   -DEPTH: 28" MINIMUM
6. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. **GROWING MEDIUM:**
   -DEPTH: 18" MIMIMUM
   -SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
   -FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
8. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
9. **PLANTER WALLS:**
   -MATERIALS SHALL BE STONE, BRICK, CONCRETE OR OTHER DURABLE MATERIAL.
   -CONCRETE, BRICK, OR STONE WALLS SHALL BE INCLUDED ON FOUNDATION PLANS.
   -INSTALL INVERTED CURB AS NEEDED BETWEEN PLANTERS AND ROAD SUBGRADE.
   -WALL HEIGHTS GREATER THAN 24" ABOVE GRADE REQUIRE HANDRAIL.
10. **WATERPROOF LINER:**
    -LINER SHALL BE 30 MIL PVC OR EQUIVALENT.
    -A WATERPROOF LINER IS NOT REQUIRED IF THE WALL MATERIAL IS WATERPROOF REINFORCED CONCRETE OR APPROVED EQUAL.
11. **INSTALL RIVER ROCK** SPLASH PAD TO TRANSITION FROM INLET TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" - 3".
12. **SEASONAL HIGH GROUNDWATER SEPARATION:**
    -SEPARATION DISTANCE AS REQUIRED BY THE CITY.
13. **SUBMIT RETAINING WALL DESIGN** IN ACCORDANCE WITH APPLICABLE STRUCTURAL CODES FOR REVIEW AND APPROVAL.

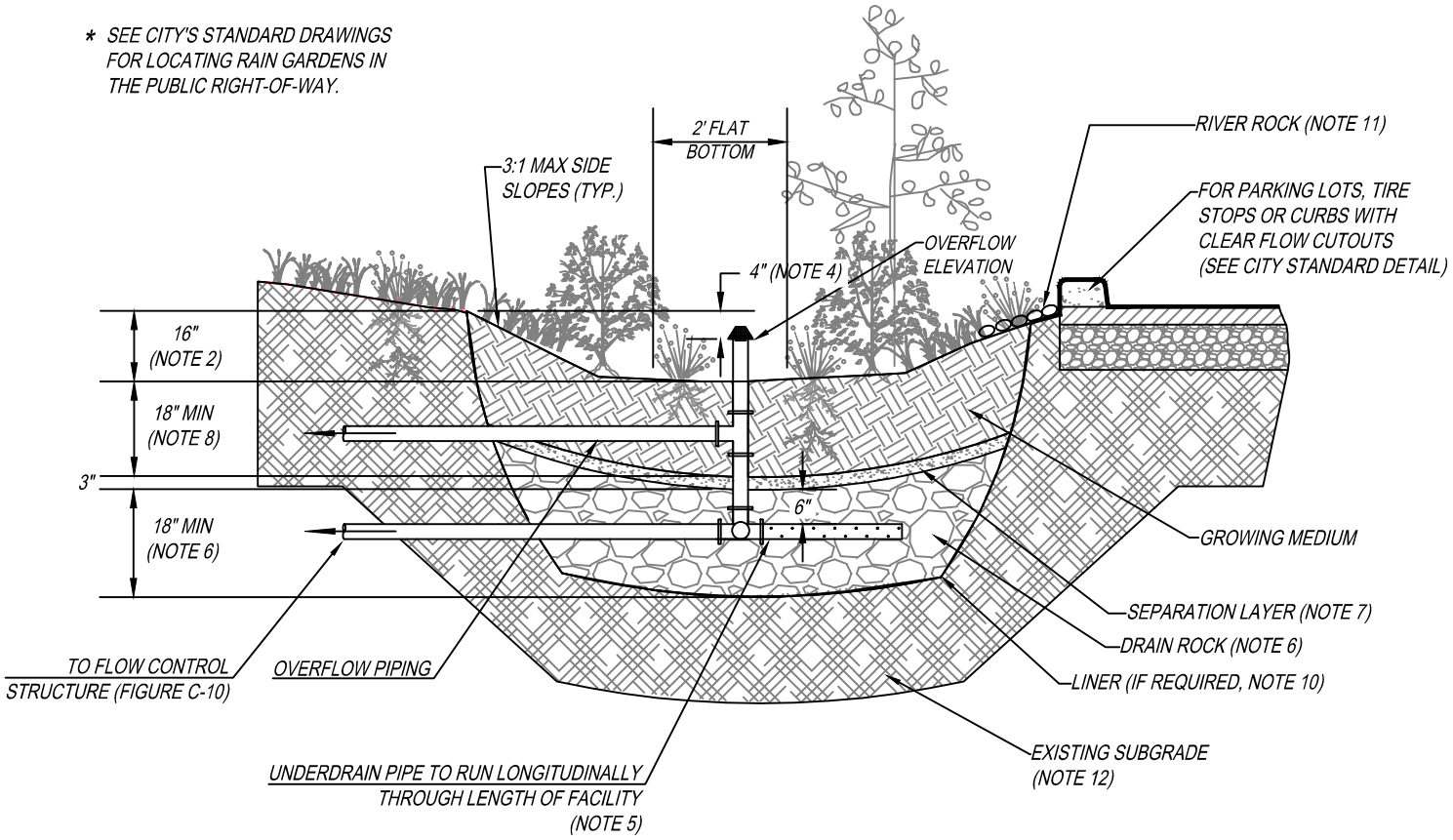
Stormwater Planter - Infiltration
Figure C-2

Stormwater Planters
Operations & Maintenance Plan

What to Look For	What to Do
Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains and curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Check Dams	-Maintain 4 to 10 inch deep rock check dams at design intervals.
Vegetation	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back grass and prune overgrowth 1-2 times per year. Remove cuttings.
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Replace splash blocks or inlet gravel/rock.
Slope Slippage	-Stabilize 3:1 slopes/banks with plantings from Appendix A.
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.
Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.
Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.
All seasons. Weed as necessary. Clean scuppers or curb inlets as needed.
Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.
Access: Maintain ingress/egress to design standards.
Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.
Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact emergency response agencies for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.
Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

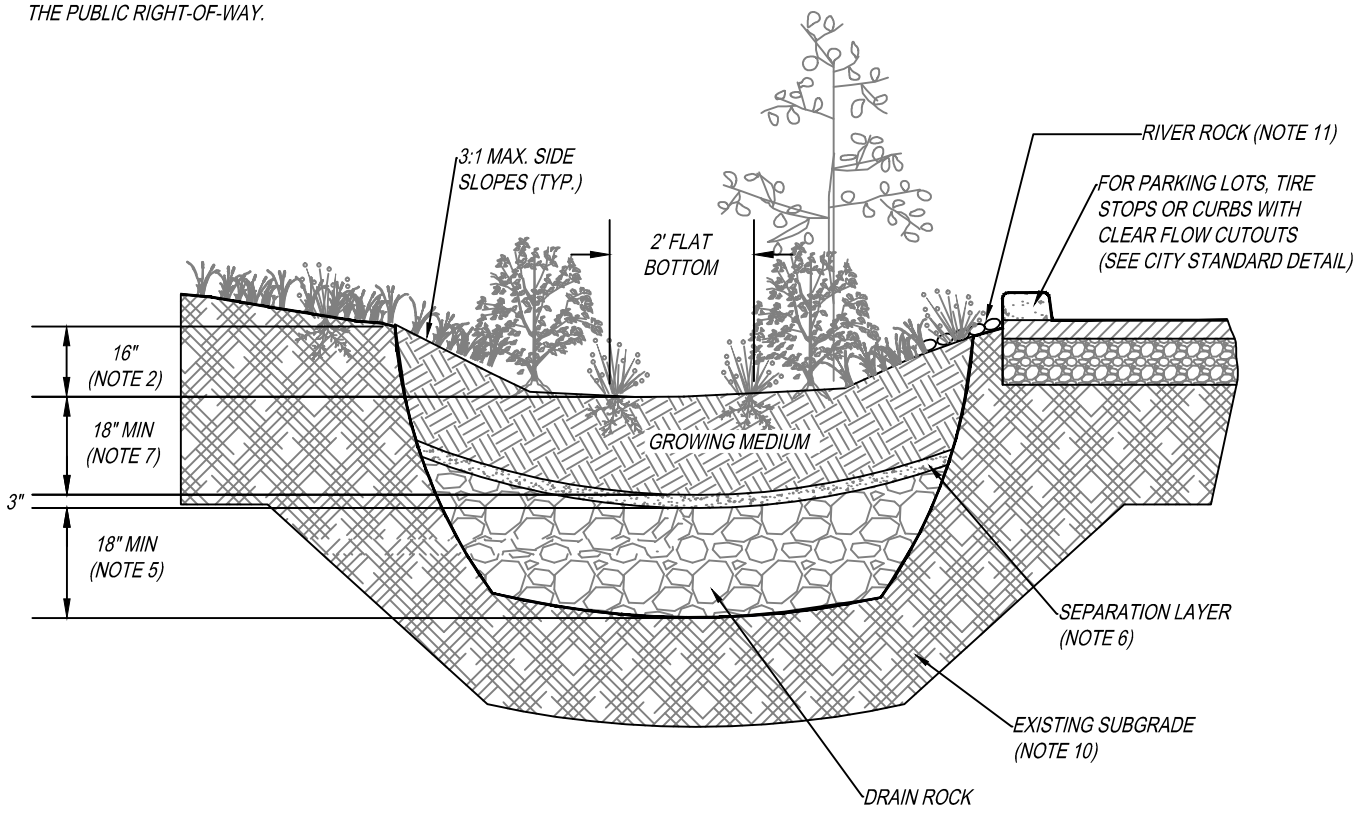


GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION. UNLESS REQUIRED BY SITE CONDITIONS, UNLINED RAIN GARDENS ARE PREFERRED TO MAXIMIZE ONSITE INFILTRATION.
2. **DIMENSIONS:**
   -DEPTH OF BASIN (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 12"
   -FLAT BOTTOM WIDTH: 2' MINIMUM
   -SIDE SLOPES OF BASIN: 3:1 MAXIMUM
   -SLOPE OF RAIN GARDEN: 0.5% OR LESS
3. **SETBACKS:**
   -FILTRATION RAIN GARDEN MUST BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES UNLESS APPROVED BY BUILDING OFFICIAL.
4. **OVERFLOW:**
   -OVERFLOW REQUIRED. INLET ELEVATION MUST ALLOW FOR 4" OF FREEBOARD, MINIMUM.
   - PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE.
5. **PIPING:**
   -PERFORATED UNDERDRAIN PIPING: SHALL BE ABS SCH. 40, DUCTILE IRON, OR PVC SCH.40. MINIMUM DIAMETER IS 6". PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
   -OVERFLOW PIPING: SHALL BE ABS SCH. 40, DUCTILE IRON, OR PVC SCH. 40 AND SHALL NOT BE PERFORATED. MINIMUM DIAMETER IS 6". PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
6. **DRAIN ROCK:**
   -SIZE: 1 1/2" to 3/4"-0 WASHED
   -DEPTH: 18" MINIMUM
7. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
8. **GROWING MEDIUM:**
   -DEPTH: 18" MINIMUM
   -SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
   -FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
9. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
10. **WATERPROOF LINER (IF REQUIRED):** SHALL BE 30 MIL PVC OR EQUIVALENT.
11. **INSTALL RIVER ROCK** OR SPLASH PAD TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" - 3".
12. **SEASONAL HIGH GROUNDWATER SEPARATION:**
    -SEPARATION DISTANCE AS REQUIRED BY CITY.

Rain Garden - Filtration
Figure C-4

* SEE CITY'S STANDARD DRAWINGS FOR LOCATING RAIN GARDENS IN THE PUBLIC RIGHT-OF-WAY.



GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION.
2. **DIMENSIONS:**
   -DEPTH OF BASIN (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 16"
   -FLAT BOTTOM WIDTH: 2' MINIMUM
   -SIDE SLOPES OF BASIN: 3:1 MAXIMUM
   -SLOPE OF RAIN GARDEN: 0.5% OR LESS
3. **SETBACKS:**
   -INFILTRATION RAIN GARDEN MUST BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES.
4. **OVERFLOW:**
   -EMERGENCY OVERFLOW PATH FOR THE 100 YEAR DESIGN STORM SHALL BE IDENTIFIED IN THE STORMWATER MANAGEMENT PLAN.
5. **DRAIN ROCK:**
   -SIZE: 1 1/2" TO 3/4"- WASHED
   -DEPTH: 18"
6. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. **GROWING MEDIUM:**
   -DEPTH: 18" MINIMUM
   -SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
   -FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
8. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
9. **INSTALL RIVER ROCK** SPLASH PAD TO TRANSITION FROM INLET TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" TO 3".
10. **SEASONAL HIGH GROUNDWATER SEPARATION:**
    -SEPARATION DISTANCE AS REQUIRED BY THE CITY.

Rain Garden - Infiltration
Figure C-5

Rain Gardens
Operations & Maintenance Plan

What to Look For	What to Do
Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains and curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Check Dams	-Maintain 4 to 10 inch deep rock check dams at design intervals.
Vegetation	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back grass and prune overgrowth 1-2 times per year. Remove cuttings.
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Replace splash blocks or inlet gravel/rock.
Slope Slippage	-Stabilize 3:1 slopes/banks with plantings from Appendix A.
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.
Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.
Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.
All seasons. Weed as necessary. Clean scuppers or curb cuts as needed.
*Maintenance Record*s: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.
Access: Maintain ingress/egress to design standards.
Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.
Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact emergency response agencies for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.
Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

Vegetated Swales

Vegetated Swales function similar to rain gardens, but include a sloped bottom to allow transport of stormwater runoff to a downstream outlet. In this way, vegetated swales can be utilized for stormwater treatment and conveyance.



VEGETATED SWALES

A vegetated swale is a gently sloping landscaped depression that collects and conveys stormwater runoff. The densely planted swale filters stormwater as it flows the length of the swale and allows infiltration of water through topsoil and into the ground. The vegetated swale may discharge to a storm sewer or other approved discharge point where soils do not drain well, or if liner is required.

Benefits

- Vegetated swales may help fulfill a site's landscaping area requirement and can be used to treat stormwater from all types of impervious surfaces including private property and the public right-of-way, rooftops, parking lots, and streets.
- Vegetated swales reduce stormwater flow rates, volume, and temperature, and improve water quality. Pollutants are removed as the runoff passes through the vegetation and soil layer and is collected in an underlying layer of gravel or drain rock.
- Where soils do not drain well, swales can overflow to an approved discharge point.

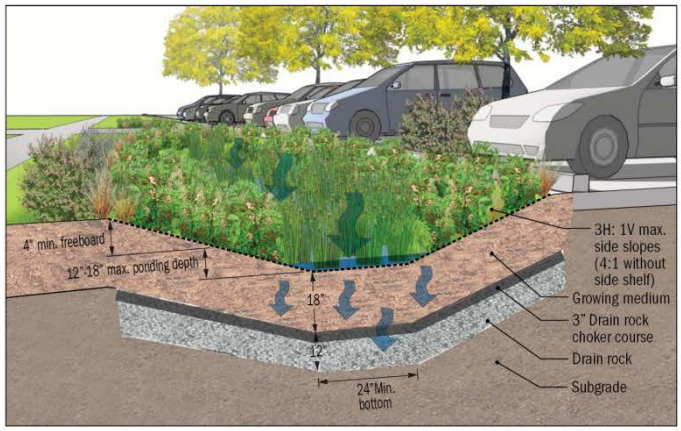


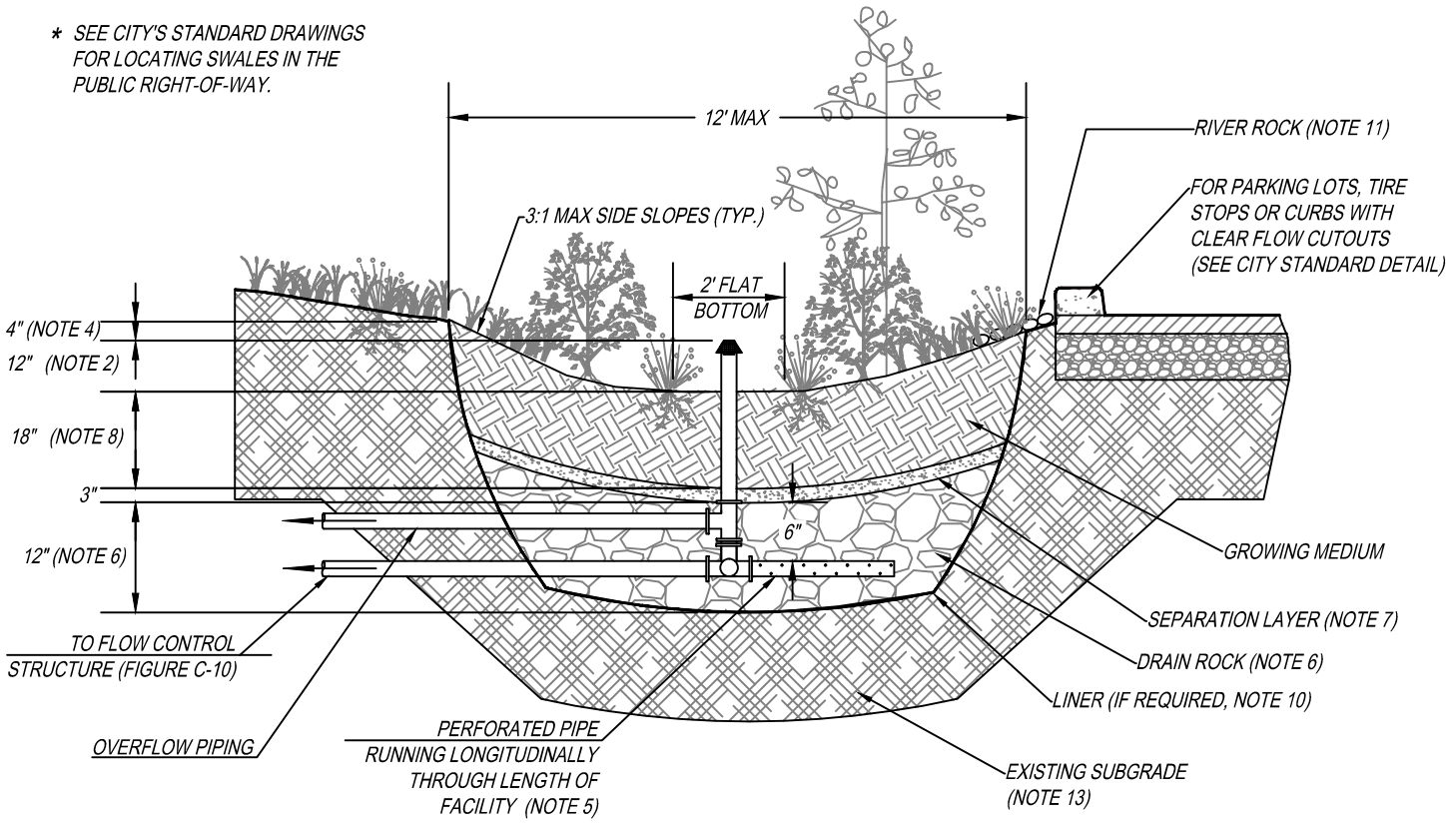
Image from Clean Water Services LIDA Handbook



New Seasons, SE Division St, Portland



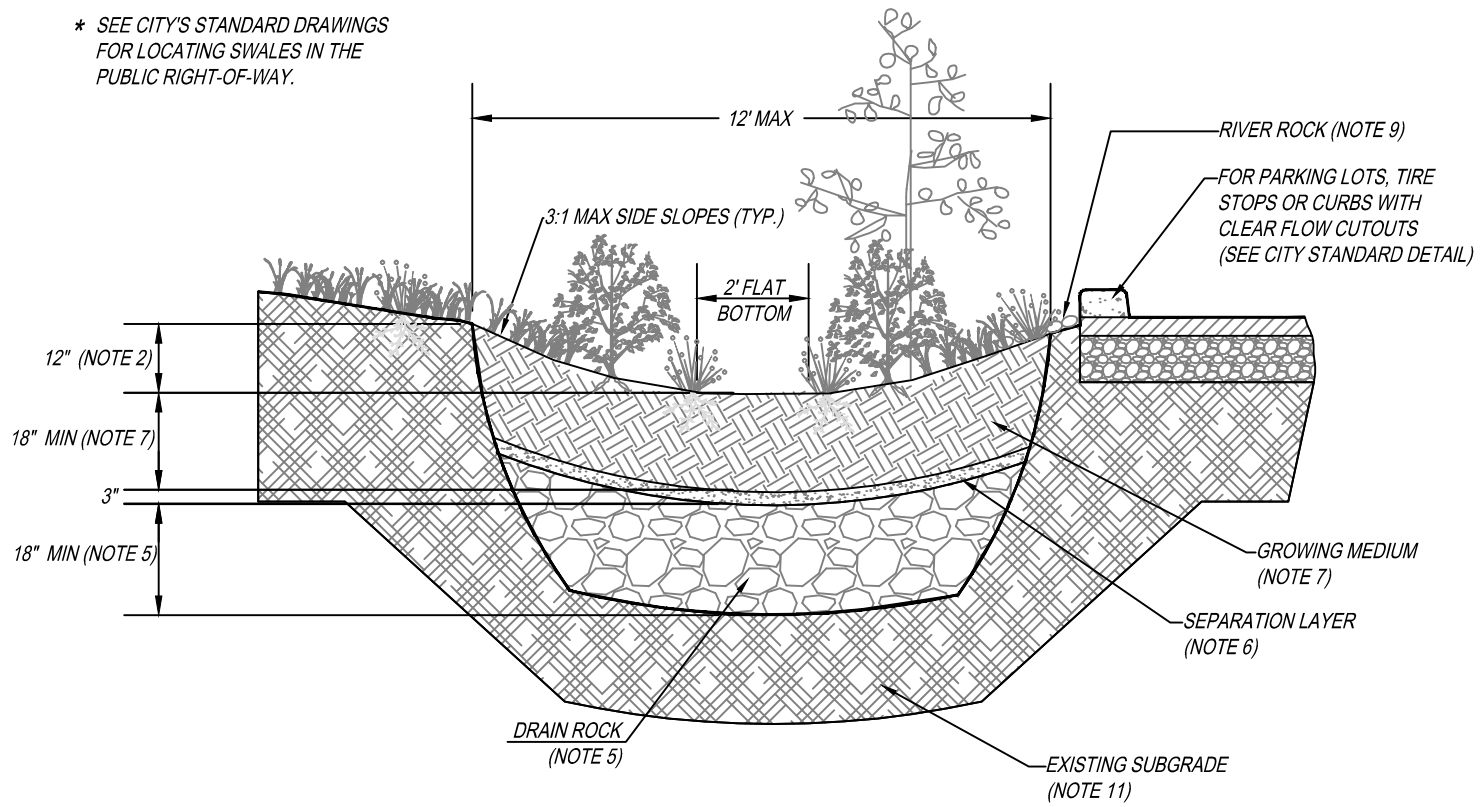
Boeckman Road, Wilsonville



GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION. UNLESS REQUIRED BY SITE CONDITIONS, UNLINED SWALES ARE PREFERRED TO ALLOW MAXIMUM INFILTRATION.
2. **DIMENSIONS:**
   -DEPTH OF SWALE (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 12"
   -LONGITUDINAL SLOPE OF SWALE: 6.0% OR LESS
   -FLAT BOTTOM WIDTH: 2' MINIMUM
   -SIDE SLOPES OF SWALE: 3:1 MAXIMUM
3. **SETBACKS:**
   -FILTRATION SWALES MUST BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES UNLESS APPROVED BY BUILDING OFFICIAL.
4. **OVERFLOW:**
   -INLET ELEVATION MUST ALLOW FOR 4" OF FREEBOARD, MINIMUM.
   - PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE.
5. **PIPING:**
   -PERFORATED UNDERDRAIN PIPING: SHALL BE ABS SCH. 40, DUCTILE IRON, OR PVC SCH.40. MINIMUM DIAMETER IS 6". PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
   -OVERFLOW PIPING: SHALL BE ABS SCH. 40, DUCTILE IRON, OR PVC SCH. 40 AND SHALL NOT BE PERFORATED. MINIMUM DIAMETER IS 6". PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
6. **DRAIN ROCK:**
   -SIZE: 1 1/2" - 3/4" WASHED
   -DEPTH: 12"
7. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
8. **GROWING MEDIUM:**
   -18" MINIMUM
   -SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
   -FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
9. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
10. **WATERPROOF LINER (IF REQUIRED):** SHALL BE 30 MIL PVC OR EQUIVALENT.
11. **INSTALL RIVER ROCK** OR SPLASH PAD TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" TO 3".
12. **CHECK DAMS:** SHALL BE PLACED ACCORDING TO FACILITY DESIGN. REFER TO CITY STANDARD DETAILS FOR PROFILE AND SPACING.
13. **SEASONAL HIGH GROUNDWATER SEPARATION:**
    -SEPARATION DISTANCE AS REQUIRED BY CITY.

Vegetated Swale - Filtration
Figure C-7



GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION.
2. **DIMENSIONS:**
   -DEPTH OF SWALE (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 12"
   -LONGITUDINAL SLOPE OF SWALE: 6.0% OR LESS
   -FLAT BOTTOM WIDTH: 2'
   -SIDE SLOPES OF SWALE: 3:1 MAXIMUM
3. **SETBACKS:**
   -INFILTRATION VEGETATED SWALES MUST BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES.
4. **OVERFLOW:**
   -EMERGENCY OVERFLOW PATH FOR THE 100 YEAR DESIGN STORM SHALL BE IDENTIFIED ON THE STORMWATER MANAGEMENT PLAN.
5. **DRAIN ROCK:**
   -SIZE: 1 1/2" - 3/4"- WASHED
   -DEPTH: 18"
6. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. **GROWING MEDIUM:**
   -18" MINIMUM
   -SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
   -FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
8. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
9. **INSTALL RIVER ROCK** OR SPLASH PAD TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" TO 3".
10. **CHECK DAMS:** SHALL BE PLACED ACCORDING TO FACILITY DESIGN. REFER TO CITY STANDARD DETAILS FOR PROFILE AND SPACING.
11. **SEASONAL HIGH GROUNDWATER SEPARATION:**
    -SEPARATION DISTANCE AS REQUIRED BY CITY.

Vegetated Swale - Infiltration
Figure C-8

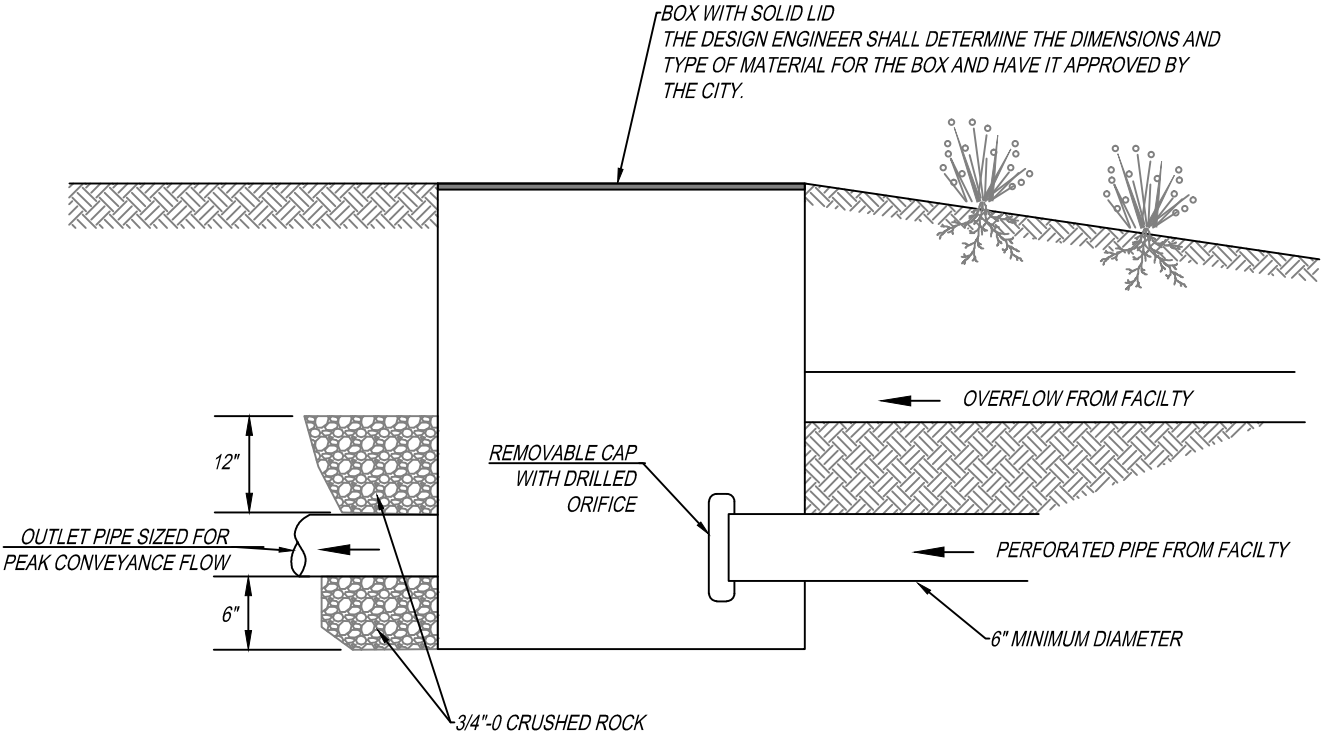
Vegetated Swales
Operations & Maintenance Plan

What to Look For	What to Do
Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains, curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Replace/seal cracks. Replace when repair is insufficient.
Check Dams	-Maintain 4 - 10 inch deep rock check dams at design intervals.
Vegetation	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back to 4-6 inches, 1-2 times per year. Remove cuttings.
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Restore or create outfalls, check dams, or splash blocks where necessary.
Slope Slippage	-Stabilize slope.
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.
Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.
Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.
All seasons. Weed as necessary. Clean scuppers or curb cuts as needed.
Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.
Access: Maintain ingress/egress to design standards.
Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.
Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact emergency response agencies for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.
Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

PLANTER, RAIN GARDEN, SWALE
FLOW CONTROL STRUCTURE



Planter, Rain Garden, Swale Flow Control Structure
Figure C-10

Detention Ponds

The principles of detention pond design are the same as those for constructed wet ponds, though the outlet control structure presented in this example from Clean Water Services should be replaced by an outlet control system that matches the design principles from the BMP Sizing Tool (See facility details in Appendix C for more information).



CONSTRUCTED WET PONDS

A constructed wet pond is a landscaped depression that collects and holds stormwater runoff and allows pollutants to settle and filter out during storm events. Constructed wet ponds have a permanent pool of water and also an extended detention area above that fills during storm events and releases water slowly over a number of hours. The permanent pool is sized to reduce pollution by settling and biological processes. The extended detention area is sized to meet flow control requirements.

Benefits

- Constructed Wet Ponds can be used to treat stormwater from all types of impervious surfaces including private property and the public right-of-way, rooftops, parking lots, and streets.
- Constructed Wet Ponds reduce stormwater flow rates, volume, and temperature, and improve water quality. Pollutants are removed through settling and biofiltration through vegetation and soils.
- Constructed Wet Ponds can be designed as multi purpose site amenities and can significantly contribute to urban habitat for birds and other organisms.
- Detention storage volume can be included in wetland sizing, or a detention pond can be designed for detention only without a permanent pool, if water quality requirements are met separately on site.

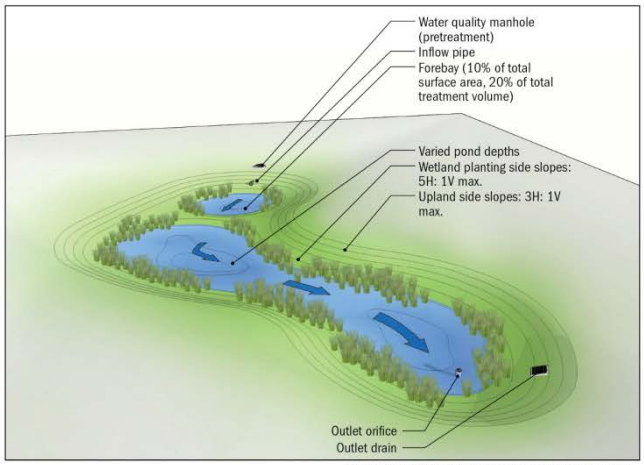
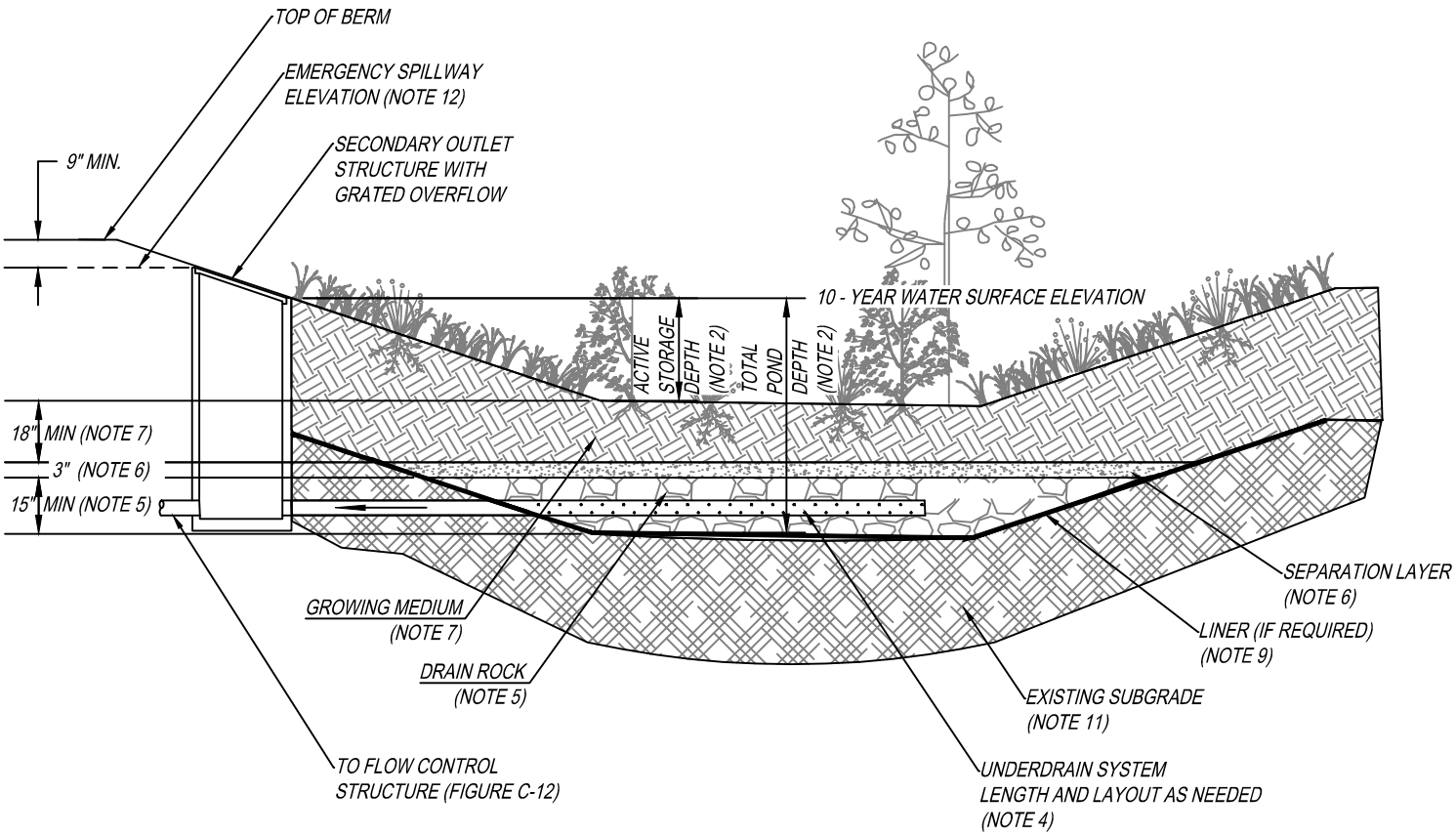


Image from Clean Water Services LIDA Handbook



Washington County

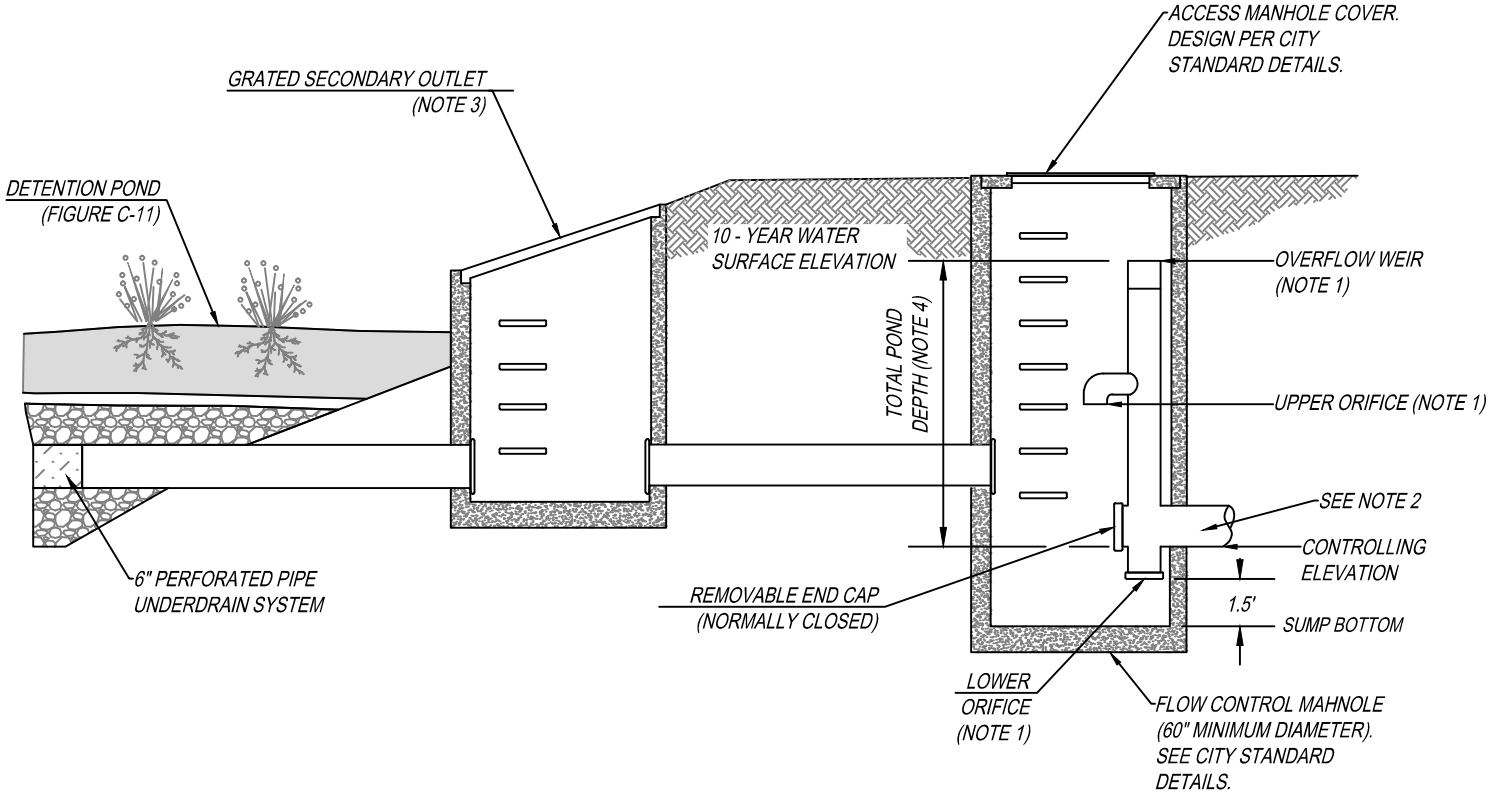


GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION. UNLESS REQUIRED BY SITE CONDITIONS, UNLINED PONDS ARE PREFERRED TO ALLOW MAXIMUM INFILTRATION.
2. **DIMENSIONS:**
   -ACTIVE STORAGE DEPTH (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): PER FACILITY SIZING MODEL
   -TOTAL POND DEPTH: 4' MINIMUM, PER FACILITY SIZING MODEL
   -BOTTOM SLOPE: 2.0% OR LESS
   -SIDE SLOPES OF DETENTION POND: 3:1 MAXIMUM
3. **SETBACKS:**
   -DETENTION POND MUST BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES UNLESS APPROVED BY BUILDING OFFICIAL.
4. **PIPING:**
   -PERFORATED UNDERDRAIN PIPING: SHALL BE ABS SCH. 40, DUCTILE IRON OR PVC SCH. 40. 6" MINIMUM DIAMETER. PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
5. **DRAIN ROCK:**
   -SIZE: 1 1/2" - 3/4" WASHED
   -DEPTH: 15" MINIMUM
6. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. **GROWING MEDIUM:**
   -18" MINIMUM
   -SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
8. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
9. **WATERPROOF LINER (IF REQUIRED):** SHALL BE 30 MIL PVC OR EQUIVALENT FOR DETENTION POND.
10. **INSTALL RIVER ROCK** OR SPLASH PAD TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" TO 3".
11. **SEASONAL HIGH GROUNDWATER SEPARATION:**
    -SEPARATION DISTANCE AS REQUIRED BY CITY.
12. **EMERGENCY SPILLWAY** SIZED TO CONVEY THE 100 - YEAR DESIGN STORM. PROVIDE 6" MINIMUM FREEBOARD ABOVE THE 100 - YEAR DESIGN STORM.

Detention Pond
Figure C-11

DETENTION POND FLOW CONTROL STRUCTURE



NOTES:

1. ORIFICE AND WEIR DIMENSIONS AND ELEVATION DETERMINED THROUGH FACILITY SIZING MODEL.
2. PIPE SIZING DETERMINED BY ENGINEER.
3. SECONDARY OUTLET SIZED FOR PEAK DESIGN STORM.
4. TOTAL POND DEPTH, PER FACILITY SIZING MODEL, INCLUDES GROWING MEDIA, SEPARATION LAYER, AND DRAIN ROCK AS SHOWN ON FIGURE C-11.

Detention Pond
Operations & Maintenance Plan

Detention Ponds remove pollutants through several processes: sedimentation, filtration, and biological processes. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

What to Look For	What to Do
Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains, curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Clogged Control Structures	-Remove accumulated sediment and debris.
Vegetation shall cover 90% of the facility.	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back grass and prune overgrowth 1-2 times per year. Remove cuttings.
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Replace splash blocks or inlet gravel/rock.
Slope Slippage	-Stabilize 3:1 Slopes/banks with plantings from Appendix A.
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

All facility components, vegetation, and source controls shall be inspected for proper operations and structural stability. These inspections shall occur, at a minimum, quarterly for the first 2 years from the date of installation, and 2 times per year thereafter, and within 48 hours after each major storm event.

Access: Maintain ingress/egress to design standards.

Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact emergency response agencies for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

Porous Pavement



POROUS PAVEMENT

Porous pavement is a water permeable structural groundcover that infiltrates precipitation, attenuates stormwater runoff flows and volumes, and reduces temperatures. Porous pavement provides a stable load-bearing surface without increasing a project's total impervious area. The two main categories of porous pavements approved by the District are 1) pervious concrete and 2) permeable pavers. Pervious concrete is poured in place and resembles its solid counterpart. Permeable pavers are solid, discrete units typically made of pre-cast concrete, brick, stone, or cobbles and set to allow water to flow between them.

Benefits

- Porous pavement reduce site impervious area, reducing the required size of stormwater facilities. The area of a porous pavement may be directly substracted from site impervious area in the District's Impervious Reduction Form.
- Porous pavement reduces stormwater flow rates, volume, and temperatures by temporarily storing stormwater and allowing infiltration of stormwater into underlying soils.
- Pervious concrete and permeable pavers can be used in most pedestrian areas, residential driveways, public sidewalks, and parking lots. Local jurisdictions may approve pervious concrete for non-travel lane sections of private streets and public roadways on a case-by-case basis.
- Detention storage volume may be built into the drain rock layer as approved.

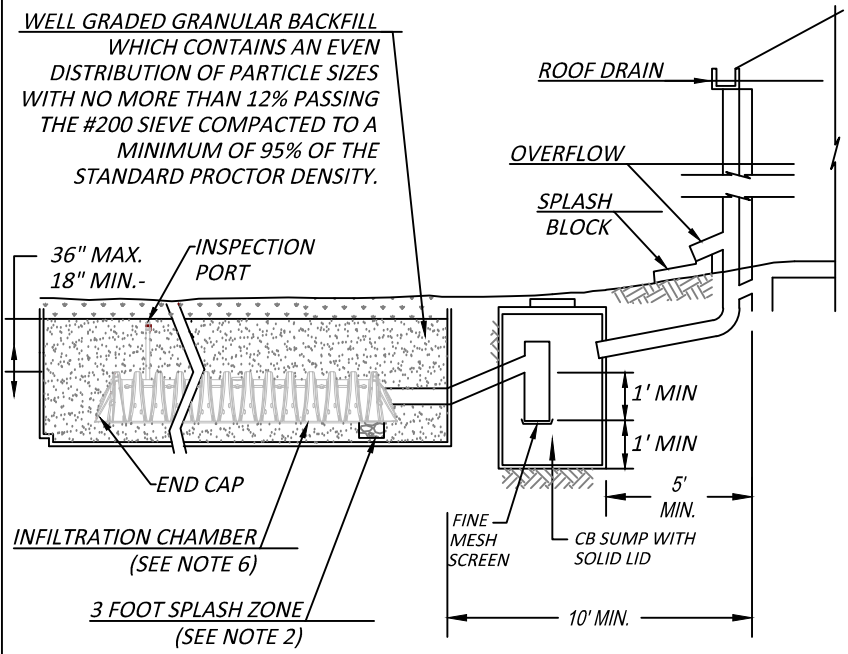


Image from Clean Water Services LIDA Handbook

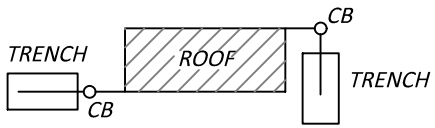
Roof Infiltration System
Figure C-14

OREGON CITY

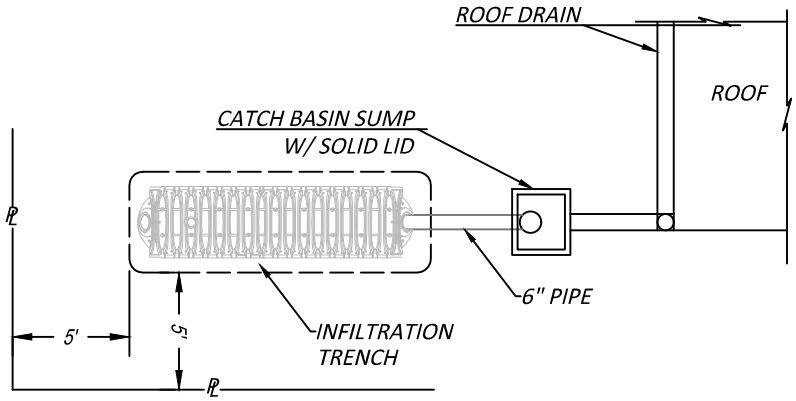
OREGON CITY
STORMWATER AND
GRADING
DESIGN STANDARDS



PROFILE VIEW
NOT TO SCALE



POSSIBLE ALIGNMENTS



PLAN VIEW
NOT TO SCALE

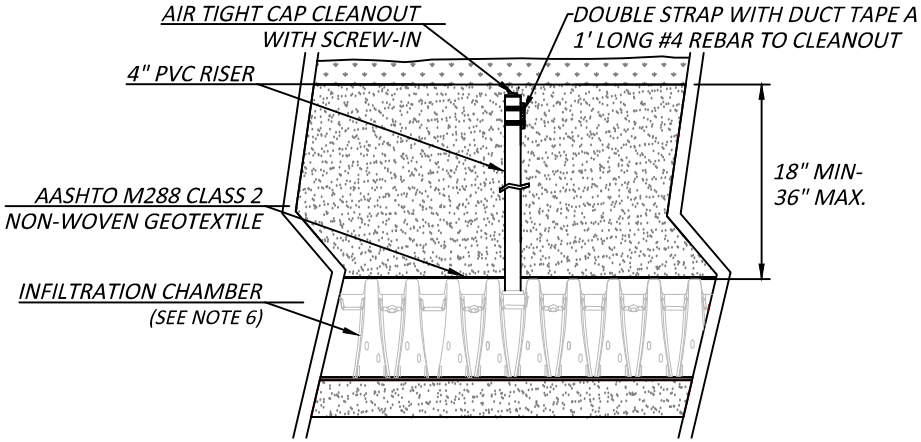
GENERAL NOTES

1. LENGTH OF TRENCH AND NUMBER OF CHAMBERS IS DETERMINED USING THE TABLE BELOW OR BY A PROFESSIONAL ENGINEERING STUDY BASED ON A SOIL PERCOLATION TEST.
2. 3 FOOT SPLASH ZONE CONSISTS OF 1" TO 2" WASHED, CRUSHED ANGULAR STONE.
3. INFILTRATION CHAMBERS ARE TO BE ENTIRELY WRAPPED BY AASHTO M288 CLASS 2 NON-WOVEN GEOTEXTILE.
4. VOLUME OF CHAMBER VARIES WITH EACH CHAMBER MANUFACTURER AND MODEL.
5. PROVIDE AN ADEQUATE NUMBER OF CHAMBERS TO MEET OR EXCEED THE MINIMUM REQUIRED CHAMBER VOLUME.
6. INFILTRATION CHAMBERS SHALL BE MANUFACTURED BY ONE OF THE FOLLOWING OR APPROVED EQUAL:

STORMTECH	CULTEC INC.	INFILTRATOR SYSTEMS INC.
(WWW.STORMTECH.COM)	(WWW.CULTEC.COM)	(WWW.INFILTRATORSYSTEMS.COM)
1-888-892-2694	1-800-4-CULTEC	1-800-718-2754

7. SOIL CLASSIFICATION MAP IS AVAILABLE FOR VIEWING AT WWW.ORCITY.ORG.

	MINIMUM REQUIRED CHAMBER VOLUME (FT3)		
	SOIL CLASSIFICATION TYPES		
HOUSE SIZE (SF)	I	II	III
1500	SURFACE RUNOFF ONLY	7	37
2000	SURFACE RUNOFF ONLY	9	49
2500	SURFACE RUNOFF ONLY	11	61
3000	SURFACE RUNOFF ONLY	13	73
3500	SURFACE RUNOFF ONLY	15	85
4000	SURFACE RUNOFF ONLY	17	97



INSPECTION PORT DETAIL
NOT TO SCALE

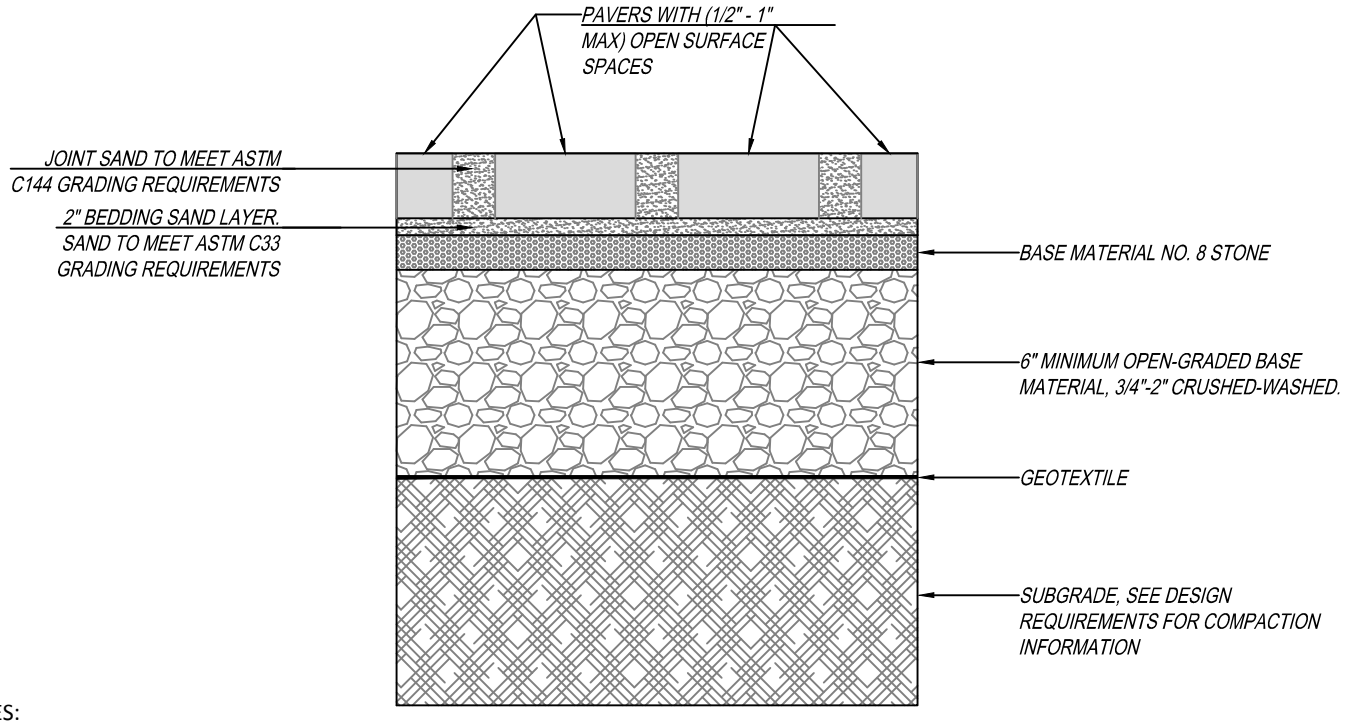
ROOF INFILTRATION SYSTEM
NOT TO SCALE

Roof Infiltration System
Operations & Maintenance Plan

What to Look For	What to Do
Structural Components, include pipes, manholes, rock/sand reservoirs, storm chambers and silt traps.	
Clogged inlets or outlets	-Clean gutters, rain drains, and silt traps twice a year. -Clear piping to facility when blockage occurs.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Catch Basin	-Remove accumulated sediment annually.
Vegetation includes surface cover and nearby plantings.	
Large Shrubs and Trees	-Prevent large root systems from damaging subsurface structural components.
Filter Layer, includes rock/gravel bed.	
Ponding Water	-Clear piping through facility when ponding occurs. -Replace rock/sand reservoirs as necessary. -Tilling of subgrade below reservoir may be necessary (for trenches) prior to backfill. -May require decommissioning and replacement (for infiltrators or trenches).

Annual Maintenance Schedule:

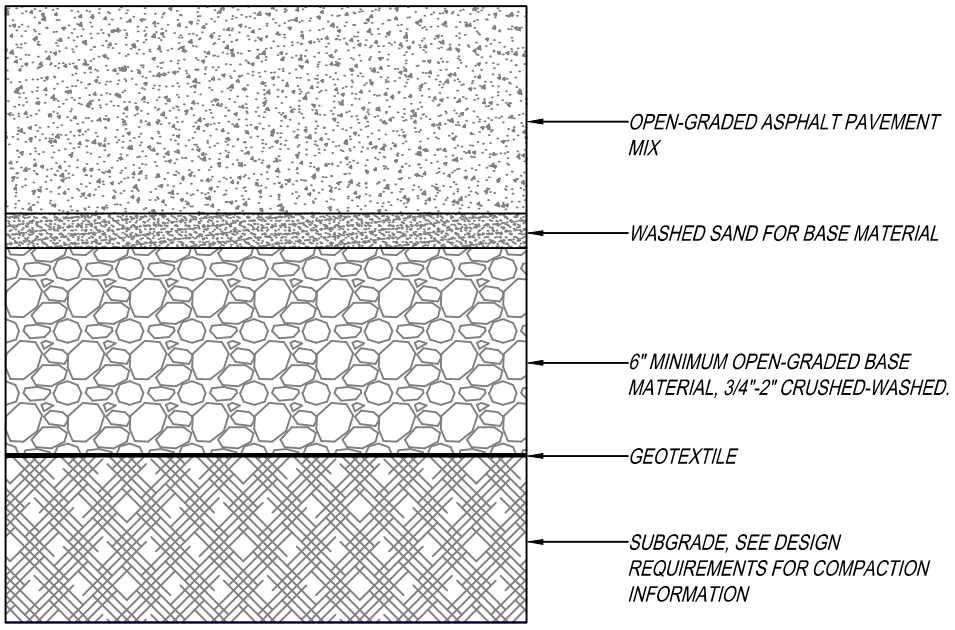
Summer. Make necessary structural repairs. Clean silt traps.
Fall. Clean gutters and rain drains.
Winter. Monitor infiltration rates.
Spring. Clean gutters and rain drains.
Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.
Access: Maintain ingress/egress to design standards.
Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.
Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact emergency response agencies for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.
Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.



PERVIOUS CONCRETE BLOCK OR "PAVER" SYSTEMS

NOTES:

1. THE DESIGN ENGINEER SHALL SUBMIT PERVIOUS PAVEMENT DESIGN AND SPECIFICATIONS IN CONFORMANCE WITH INDUSTRY STANDARDS.
2. PAVERS AVERAGE COMPRESSIVE STRENGTH OF 8,000 PSI. NO INDIVIDUAL UNIT LESS THAN 7,200 PSI. MINIMUM 80 MM THICKNESS.
3. BANDED BY CONCRETE EDGE RESTRAINTS.
4. MANHOLE COLLARS PER CITY STANDARD DETAIL.



PERVIOUS (OPEN GRADED) CONCRETE SYSTEMS

Pervious Pavement
Operations & Maintenance Plan

Pervious pavement is a permeable pavement surface with an underlying stone reservoir that temporarily stores surface runoff before infiltrating into the subsoil or being collected in underlying drain pipes and being discharged off-site. There are many types of pervious pavement including plastic rings planted with grass, stone or concrete blocks with pore spaces backfilled with gravel or sand, porous asphalt, and porous concrete. Pervious pavement accepts only precipitation, not stormwater runoff. The following items shall be inspected and maintained as stated:

What to Look For	What to Do
Structural Components, including surface materials, shall evenly infiltrate stormwater.	
Clogged surface	-Vacuum sweep at least twice a year. -Powerwash annually or as needed. Do not use surfactants.
Cracked or moving edge restraints	-Repair per manufacturer's recommendations.
Cracked or loose pavement	-Repair per manufacturer's recommendations.
Vegetation includes surface cover and nearby plantings.	
Large Shrubs and Trees	-Sweep leaf litter and sediment to prevent surface clogging and ponding. -Prevent large root systems from damaging pavement. -Manually remove weeds. Remove all plant debris.
Filter Medium	
Aggregate loss in pavers from settling and from power washing.	-Replace paver pore space with aggregate from original design.

Maintenance Schedule:

Summer. Make necessary structural repairs.
Fall. Vacuum sweep.
Winter. Monitor infiltration rates.
Spring. Power wash with proper disposal. Vacuum sweep.
All Seasons: Weed as necessary.
Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.
Access: Maintain ingress/egress to design standards.
Infiltration/Flow Control: All facilities shall not retain standing water during dry weather. Record time/date, weather, and site conditions when ponding occurs.
Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact emergency response agencies for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.
Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

Green Roofs



GREEN ROOFS

A green roof is a thin lightweight vegetated roof system used in place of a conventional roof. Greenroofs typically consist of a waterproof membrane, drainage material, a lightweight layer of soil, and a cover of plants. Species are chosen appropriate for a rooftop environment - dry and hot in summer, wet in winter. Extensive greenroofs are not intended to be accessed except for maintenance.

Benefits

- Green roofs reduce site impervious area, reducing the required size of stormwater facilities. The area of a green roof may be directly substracted from site impervious area in the District's Impervious Reduction Form.
- Green roofs can capture and retain 60% of annual precipitation.
- Green roofs reduce runoff flow rate, volume and temperature of roof runoff.
- Green roofs outlasts conventional roofs by twenty years or more. Average green roof lifespan is 40 years.
- Green roofs slow down peak flow rates during heavy storm events which helps prevent on-site erosion and flooding especially in urban areas where soils are heavily compacted and have a low infiltration rate.
- Green roofs filter air pollutants and absorb carbon dioxide.
- A Greenroof reduces the heat island effect within an urban area by absorbing thermal UV rays from the sun. PV panels have been found to be 6% more efficient when installed over an ecoroof.

Note: Green roof information compiled from City of Portland's Bureau of Environmental Services. See http://www.portlandonline.com/BES/ for more information.

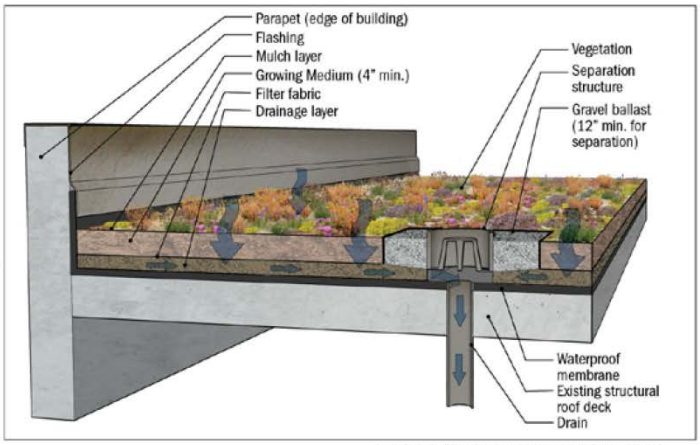
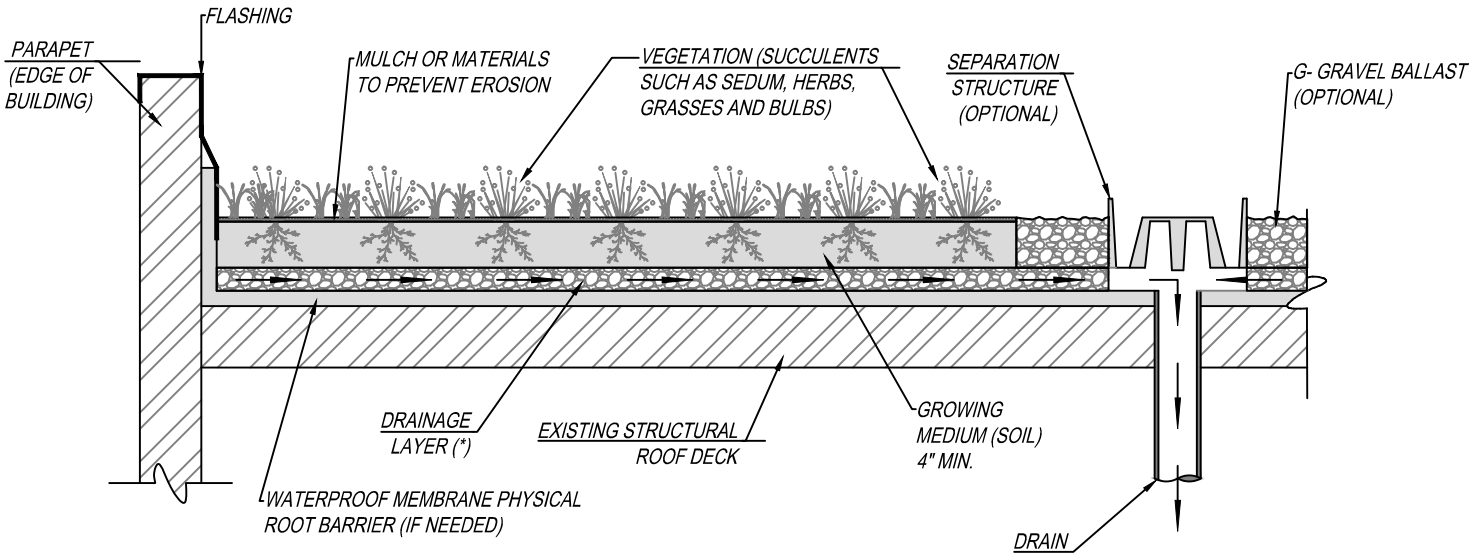
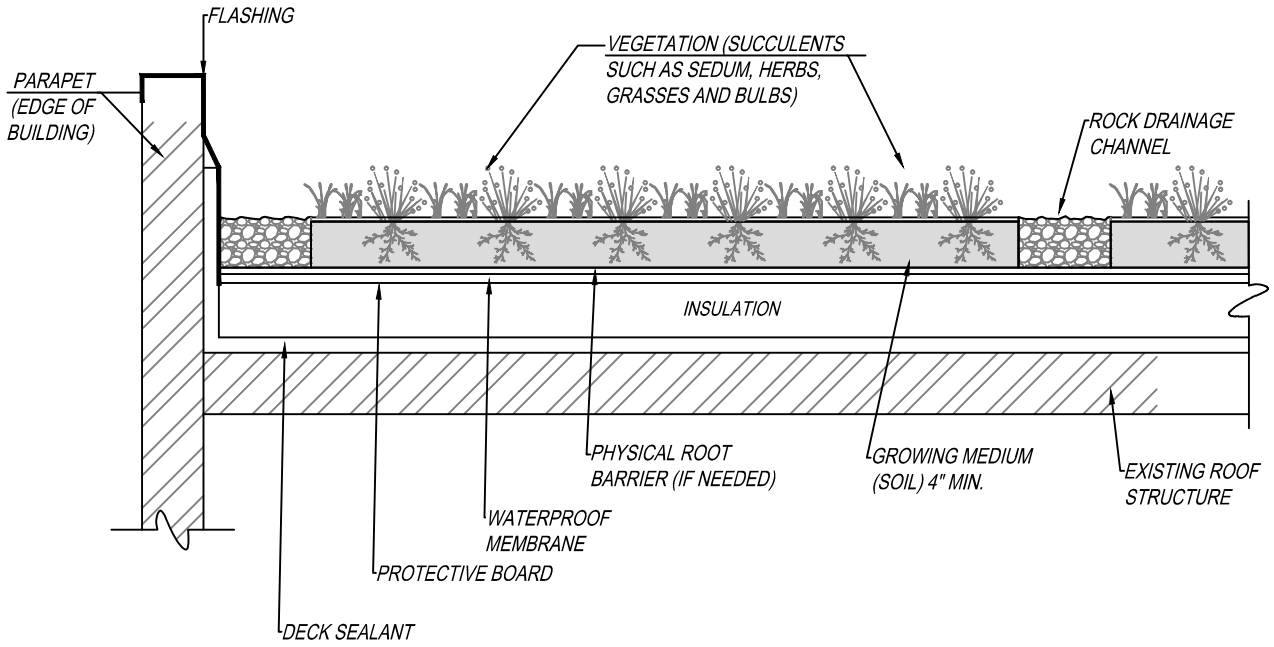


Image from Clean Water Services LIDA Handbook



* SEE DETAIL BELOW FOR OPTION

GREEN ROOF WITH DRAINAGE LAYER



GREEN ROOF WITH DRAINAGE CHANNELS

GENERAL NOTES:

1. **THE DESIGN ENGINEER** SHALL SUBMIT GREEN ROOF DESIGN AND SPECIFICATIONS IN CONFORMANCE WITH INDUSTRY STANDARDS.

Green Roof
Operations & Maintenance Plan

Green Roofs are vegetated roof systems that retain and filter stormwater and provide aesthetic and energy conservation benefits. All facility components, including soil substrate or growth medium, vegetation, drains, irrigation systems (if applicable), membranes, and roof structure shall be inspected for proper operations, integrity of the waterproofing, and structural stability throughout the life of the green roof. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

What to Look For	What to Do
Structural Components, including waterproof membrane, shall be operated and maintained in accordance with the manufacturer's and design specifications.	
Clogged drains	-Repair any leaks or structural deficiencies. -Remove sediment and debris if necessary.
Tears or perforated membrane	-Contact manufacturer for repair or replacement.
Vegetation shall cover 90% of facility.	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A.
Dry Grass or other Plants	-Prune tall, dry grasses and remove clippings.
Weeds	-Manually remove weeds. Do not use pesticides. Remove all plant debris.
Growing/Filter Medium including soil and gravels, shall sustain healthy plant cover and infiltrate within 48 hours.	
Exposed soil	-Cover with plants and mulch as needed.
Eroded soils and gullies	-Fill, hand tamp or lightly compact, and plant vegetation to disperse flow.
Crusting, dry or shrinking medium	-Rake or amend to restore filtration or flow.
Ponding or excessive moisture	-Amend soils and clear drains.

Maintenance Schedule:

Summer. Make necessary structural repairs. Improve growing medium as needed. Clear drains. Irrigate as needed.
Fall. Replant exposed soil and dead plants. Remove sediment and debris from drains. Provide erosion control for bare soil if neccessary.
Winter. Monitor infiltration rates. Clear drains as needed.
Spring. Replant exposed soil and dead plants. Remove sediment and debris from drains.
All Seasons: Weed as necessary.
Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.
Access: Maintain ingress/egress to design standards.
Irrigation: Adjust irrigation program or consult professional to set system at correct watering system.
Infiltration/Flow Control: All facilities shall drain within 48 hours. Record time/date, weather, and site conditions when ponding occurs.
Pollution Prevention: All sites shall implement best management practices to prevent hazardous wastes from contaminating stormwater. Record time/date, weather, and site conditions if site activities contaminate stormwater.
Vectors (Mosquitoes & Rodents): Green Roof shall not harbor mosquito larvae or rodents that pose a threat to public health or that undermine the facility structure. Contact Clackamas County Vector Control for assistance. Record time/date, weather, and site conditions when vector activity observed. Record when vector abatement started and ended.

STORMWATER FACILITIES
OPERATIONS AND MAINTENANCE CHECKLIST

Problem	Recommended / Required	Trigger	Preferred Condition
Sediment Accumulation in Treatment Area	Monthly from November through April / Annually Required	Sediment depth exceeds 3 inches	Sediment removed from vegetated treatment area: level side to side and drains freely toward outlet; no standing water within 24 hours of any major storm (1" in 24 hours)
Erosion Scouring	Monthly from November through April / Annually Required	Exposed earth or rutted soil	Repair ruts or bare areas by filling with topsoil during dry season; regrade and replant large bare areas
Standing Water	Monthly from November through April and after any major storm event (1 inch in 24 hours)	Standing water in the planter between storms that does not drain freely	Remove sediment or trash blockages; improve end to end grade so there is no standing water 24 hours after any major storm (1 inch in 24 hours)
Flow not Distributed Evenly	Monthly from November through April / Annually Required	Flows unevenly distributed through planter width due to uneven or clogged flow spreader	Level the spreader and clean so that flows spread evenly over entire planter width
Settlement/ Misalignment	Annually Required	Failure of planters has created safety, function, or design problem	Planter replaced or repaired to design standards
Constant Baseflow	Monthly from November through April / Annually Required	Small, continual flow of water through the planter even after weeks without rain; planter bottom has an eroded, muddy channel	Add a low-flow pea gravel drain the length of the planter or bypass the baseflow around the planter
Vegetation	Monthly from November through April / Annually Required	Vegetation blocking more than 10% of the inlet pipe opening	No vegetation blocking the inlet pipe opening
Poor Vegetation Coverage	Monthly / Annually Required	Grass or other vegetation is sparse, or bare in more than 10% of the planter area	Determine cause of poor growth and correct the condition; replant with plants (per Appendix A) as needed to meet facility standards
Invasive Vegetation	Monthly / Annually Required	No invasive vegetation is planted or permitted to remain	No invasive vegetation present; remove excessive weeds. Control if complete eradication is not feasible
Rodents	Monthly / Annually Required	Evidence of rodents or rodent damage	No rodents; functioning facility
Insects	Annually Required	Insects such as wasps and hornets that interfere with maintenance activities	Harmful Insects removed
Trash and Debris	Monthly and after any major storm event (1 inch in 24 hours) / Annually Required	Visual evidence of trash, debris or dumping	Trash and Debris removed from facility
Contamination and Pollution	Monthly from November through April / Annually Required	Any evidence of oil, gasoline, contamination or other pollutants	No contaminants or pollutants present; coordinate removal/cleanup with local water quality response agency
Obstructed Inlet/Outlet	Monthly and after any major storm event (1 inch in 24 hours) / Annually Required	Inlet/outlet areas clogged with sediment, vegetation or debris	Clear inlet and outlet; obstructions removed
Excessive Shading	Monthly from November through April / Annually Required	Vegetation growth is poor because sunlight does not reach planter	Trim over-hanging limbs and/or remove brushy vegetation as needed
Vegetation	Monthly from November through April / Annually Required	Specified or approved grass grows so tall that it competes with shrubs and/or becomes a fire danger	String trim non-wetland grasses to 4 to 6 inches and remove clippings; protect woody vegetation

APPENDIX D

Infiltration Testing

APPENDIX D. INFILTRATION TESTING

D.1 General

To properly size and locate stormwater management facilities, it is necessary to characterize the soil infiltration conditions at the location of the proposed facility. All projects that require a stormwater management facility shall evaluate existing site conditions and determine if the site's infiltration rate is adequate to support the proposed stormwater management facility. The following sections provide the approved methods for testing infiltration and setting the design infiltration rate. City staff may require additional testing on a case-by-case basis.

D.2 Basic Method - Open Pit Test

The Basic Method – Open Pit Test (Basic Method) is applicable only to projects on private property with less than 10,000 square feet of new or redeveloped impervious area. The results of infiltration testing shall be documented on the Basic Method Form. The Basic Method cannot be used for projects that have known downstream conveyance problems.

The intent of the Basic Method is to determine whether or not the local infiltration rate is adequate (0.5 inches/hour) to support an infiltration facility. The Basic Method infiltration test does not need to be conducted by a licensed professional, but it is recommended.

D.2.1 Basic Method Instructions

1. Conduct one test for each proposed stormwater management facility. The test should be where the facility is proposed or within the direct vicinity.
2. Excavate a test hole to the depth of the bottom of the infiltration system, or otherwise to 4 feet. The test hole can be excavated with small excavation equipment or by hand using a shovel, auger, or posthole digger.
3. If a layer hard enough to prevent further excavation is encountered, or if noticeable moisture/water is encountered in the soil, stop, measure, and record this depth from the surface. Proceed with the test at this depth.
4. Fill the hole with water to a height of about 6 inches from the bottom of the hole (or to one-half the maximum depth of the proposed facility), and record the exact time. Check the water level at regular intervals (every 1 minute for fast-draining soils to every 10 minutes for slower-draining soils) for a minimum of 1 hour or until all of the water has infiltrated. Record the distance the water has dropped from the top edge of the hole.
5. Repeat this process two more times, for a total of three rounds of testing. These tests should be performed as close together as possible to portray the soil's ability to infiltrate at different levels of saturation accurately. The third test provides the best measure of the saturated infiltration rate.
6. For each test pit required, submit all three testing results with the date, duration, drop in water height, and conversion into inches per hour.

If the results of the Basic Method show an infiltration rate greater than 0.5 inches per hour, the applicant can proceed with stormwater management facility design that utilizes infiltration. If the applicant would like to use an infiltration rate for design purposes, a Professional Method Infiltration Test shall be conducted.

D.3 Professional Method

The Professional Method shall be used for all public and private developments with more than 10,000 square feet of new or redeveloped impervious area. The Professional Method shall also be used for all public and private developments with known downstream conveyance problems.

Three infiltration testing methods are available, as outlined in **Sections D.3.5 through D.3.7**. The qualified professional shall exercise judgment in the selection of the infiltration test method.

D.3.1 Testing Criteria

1. Testing shall be conducted or observed by a qualified professional. This professional shall be a Professional Engineer (PE), Registered Geologist (RG), or Certified Engineering Geologist (CEG) licensed in the state of Oregon.
2. The location and depth of the test shall correspond to the facility location and depth.
3. Infiltration testing should not be conducted in engineered or undocumented fill.
4. Boring logs shall be provided as supporting information with infiltration and depth to groundwater tests.
5. All testing data shall be documented in the project submittals. The submittals shall demonstrate that the proposed facilities are sized appropriately for the tested infiltration rates.

D.3.2 Depth and Location of Required Tests

Infiltration tests shall be performed at the base of the proposed facility.

If a confining layer, or soil with a greater percentage of fines, is observed during the subsurface investigation to be within 4 feet of the bottom of the planned infiltration system, the testing shall be conducted within that confining layer.

Tests shall be performed in the immediate vicinity of the proposed facility. Exceptions can be made to the test location provided the qualified professional can support that the strata are consistent from the proposed facility to the test location.

For relatively deep stormwater facilities, a hollow stem auger with an electronic measuring tape can be used, provided there is an adequate seal between the auger and the native soil.

D.3.3 Minimum Number of Required Tests

The total number of infiltration tests is at the discretion of the qualified professional assessing the site and the City Engineer, provided the following minimums are met:

- At least one test for any proposed street facility.

- One test for every 100 lineal feet or 1,000 square feet of proposed infiltration facility.
- Where multiple types of facilities are used, it is likely that multiple tests will be necessary, since an infiltration test can test only a single soil stratum. It is highly recommended to conduct an infiltration test at each stratum used.

D.3.4 Factors of Safety

Table D-1 lists the recommended factors of safety to be applied to field obtained infiltration rates for use in stormwater system design. To obtain the infiltration rate used in design, divide the infiltration rate measured in the field by the factor of safety. The factor of safety used in design should be chosen by collaboration between the geotechnical engineer or geologist overseeing the infiltration testing and the civil engineer designing the stormwater management system. Determination of the factor of safety shall include consideration of project specific conditions such as soil variability, testing methods, consequences of system failure, complexity of proposed construction, and other pertinent conditions. The maximum design infiltration rate is 20 inches per hour.

Table D-1. Infiltration Rate Safety Factors

Test Method	Recommended Correction Factors
Encased Falling Head	3
Open Pit Falling Head	2
Double-Ring Infiltrometer	Public Facilities: 1 Private Facilities: 2

D.3.5 Open Pit Falling Head Procedure

The open pit falling head procedure is based on the Environmental Protection Agency (EPA) Falling Head Percolation Test Procedure (*Onsite Wastewater Treatment and Disposal Systems Design Manual,* EPA/625/1-80-012, 1980). The test is performed in an open excavation and therefore is a test of the combination of vertical and lateral infiltration.

1. Excavate an approximately 2-foot by 2-foot-wide hole into the native soil to the elevation of the proposed facility bottom. The test can be conducted in a machine-excavated pit or a hand-dug pit using a shovel, posthole digger, or hand auger. If smooth auguring tools or a smooth excavation bucket is used, scratch the sides and bottom of the hole with a sharp-pointed instrument, and remove the loose material from the bottom of the test hole.
2. A 2-inch layer of coarse sand or fine gravel may be placed to protect the bottom from scour and sloughing.
3. Fill the hole with clean water a minimum of 1 foot above the soil to be tested, and maintain this depth of water for at least 4 hours (or overnight if clay soils are present) to presoak the native material.

4. Percolation rate measurements shall be made after 15 hours and no more than 30 hours after the soaking period begins. It is important that the soil be allowed to soak for a sufficiently long period of time to allow the soil to swell if accurate results are to be obtained. Any soil that sloughed into the hole during the soaking period shall be removed and the water level shall be adjusted to 6 inches above the added gravel (or 8 inches above the bottom of the hole).
5. In sandy soils with little or no clay, soaking is not necessary. If after filling the hole twice with 12 inches of water, the water seeps completely away in less than 10 minutes, the test can proceed immediately.
6. The measurements should be made with reference to a fixed point. A lath placed in the test pit prior to filling or a sturdy beam across the top of the pit are convenient reference points. The tester and excavator should conduct all testing in accordance with OSHA regulations.
7. Measure the water level to the nearest 0.01 foot (1/8 inch) at 10-minute intervals for a total period of 1 hour (or 20-minute intervals for 2 hours in slower soils) or until all of the water has drained. At no time during the test is the water level allowed to rise more than 6 inches above the gravel.
8. Successive trials shall be run until the measured infiltration rate between two successive trials does not vary by more than 5 percent. At least three trials shall be conducted. After each trial, the water level is readjusted to the 12-inch level. Enter results into the **Infiltration Test Data Table** provided at the end of this section.
9. The results of the last water level drop are used to calculate the tested infiltration rate. The final rate shall be reported in inches per hour. See the calculation following the **Infiltration Test Data Table** provided at the end of this section.
10. For very rapidly draining soils, it may not be possible to maintain a water head above the bottom of the test pit. If the infiltration rate meets or exceeds the flow of water into the test pit, conduct the test in the following manner:
    a. Approximate the area over which the water is infiltrating.
    b. Using a water meter, bucket, or other device, measure the rate of water discharging into the test pit.
    c. Calculate the infiltration rate by dividing the rate of discharge (cubic inches per hour) by the area over which it is infiltrating (square inches).
11. Upon completion of the testing, the excavation shall be backfilled.

D.3.6 Encased Falling Head Test Procedure

The encased falling head procedure is based on a modification of the EPA Falling Head Percolation Test Procedure (*Onsite Wastewater Treatment and Disposal Systems Design Manual,* EPA/625/1-80-012, 1980). The most significant modification is that this test is performed with a 6-inch casing that is embedded approximately 6 inches into the native soil. The goal of this field test is to evaluate the vertical infiltration rate through a 6-inch plug of soil, without allowing any lateral infiltration. The test is not appropriate in gravelly soils or in other soils where a good seal with the casing cannot be established.

1. Embed a solid 6-inch-diameter casing into the native soil at the elevation of the proposed facility bottom (see **Figure D-1**). Ensure that the embedment provides a good seal around the pipe casing so that percolation will be limited to the 6-inch plug of the material within the casing. This method can also be applied to testing within hollow stem augers, provided the driller and tester are reasonably certain that a good seal has been achieved between the soil and auger.
2. A 2-inch layer of coarse sand or fine gravel may be placed to protect the bottom from scour and sloughing.
3. Fill the pipe with clean water a minimum of 1 foot above the soil to be tested, and maintain this depth for at least 4 hours (or overnight if clay soils are present) to presoak the native material.

   Percolation rate measurements shall be made after 15 hours and no more than 30 hours after the soaking period begins. It is important that the soil be allowed to soak for a sufficiently long period of time to allow the soil to swell if accurate results are to be obtained. Any soil that sloughed into the hole during the soaking period shall be removed and the water level shall be adjusted to 6 inches above the added gravel (or 8 inches above the bottom of the hole).

   In sandy soils with little or no clay, soaking is not necessary. If after filling the hole twice with 12 inches of water, the water seeps completely away in less than 10 minutes, the test can proceed immediately.
4. To conduct the first trial of the test, fill the pipe to approximately 6 inches above the soil and measure the water level to the nearest 0.01 foot (1/8 inch). The level should be measured with a tape or other device with reference to a fixed point. The top of the pipe is often a convenient reference point. Record the exact time.
5. Measure the water level to the nearest 0.01 foot (1/8 inch) at 10-minute intervals for a total period of 1 hour (or 20-minute intervals for 2 hours in slower soils) or until all of the water has drained. The infiltration test is continued until the measured infiltration rate between two successive trials does not vary by more than 5 percent. At least three trials shall be conducted. After each trial, the water level is readjusted to the 6-inch level. Enter results into the **Infiltration Test Data Table** provided at the end of this section. At no time during the test is the water level allowed to rise more than 6 inches above the gravel.
6. The result of the last water level drop is used to calculate the tested infiltration rate. The final rate shall be reported in inches per hour.
7. Upon completion of the testing, the casings shall be immediately pulled, and the test pit shall be backfilled.

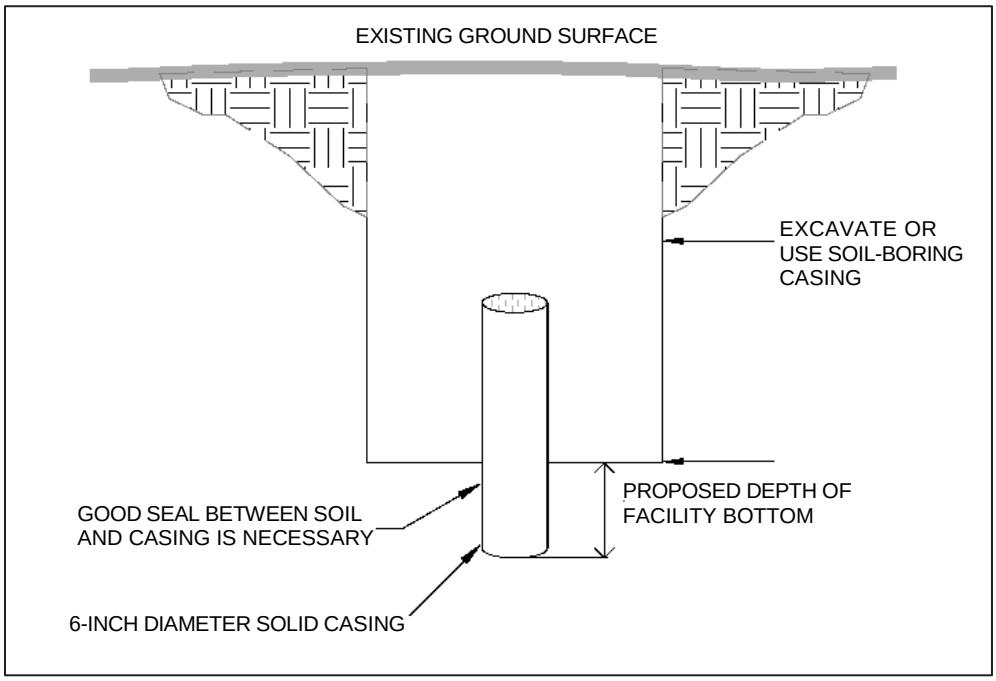


Figure D-1. Encased falling head procedure

D.3.7 Double Ring Infiltrometer Test

The double-ring infiltrometer test procedure shall conform with ASTM 3385-94. The test is performed within two concentric casings embedded and sealed to the native soils. The outer ring maintains a volume of water to diminish the potential of lateral infiltration through the center casing. The volume of water added to the center ring to maintain a static water level is used to calculate the infiltration rate. The double-ring infiltrometer is appropriate only in soils where an adequate seal can be established.

This test may be difficult to perform where the tested soil strata are in a pit, since careful regulation of the static volumes is necessary.

D.4. Reporting Requirements

In addition to the information required by the state for a signed and stamped Geotechnical Engineering Report, the following information should be included in the project's submittals.

1. Infiltration results in inches per hour.
2. Location and depth of excavation. The excavation should be deep enough to verify that there is a 5-foot separation between the final depth of the facility (rock gallery) and the seasonal high groundwater or soil layer that could reduce the infiltration rate.
3. Summary and discussion of infiltration testing, including number of tests, amounts of water used in each test (inches, gallons, etc.), and time of each test. Testing is required to show that an accurate rate was achieved.

4. Discussion of how the test was performed:
   - Open pit (size of area)
   - Encased falling head
     - Pipe type
     - Embedment depth
     - Size of pipe
   - Double ring infiltrometer
     - Pipe type
     - Embedment depth
     - Size of pipe
5. **Infiltration Test Data Table** provided at the end of this appendix.
6. Soil types with depth.
7. Groundwater observations–seasonal high groundwater level estimation.

Infiltration Test Data Table		
Location:	**Date:**	**Test Hole Number:**
Depth to bottom of hole:	**Diameter of hole:**	**Test Method:**
Tester's Name: **Tester's Company:**	**Tester's Contact Number:**	

Depth, feet	Soil Texture

Time	Time interval, minutes	Measurement, feet	Drop in water level, feet	Percolation rate, inches per hour	Remarks

Infiltration Test Data Table Example		
Location: Lot 105, Low Point Heights Subdivision	**Date:** 6/28/2010	**Test Hole Number:** 3
Depth to bottom of hole: 57 inches	**Diameter of hole:** 0.5 feet	**Test Method:** Encased falling head
Tester's Name: C.J. Tester **Tester's Company:** Tester Company		**Tester's Contact Number:** 555-1212

Depth, feet	Soil Texture
0-0.5	Black Top Soil
0.5-1.0	Brown SM
1.0-2.2	Brown ML
2.2-5.1	Brown CL

Time	Time interval, minutes	Measurement, feet	Drop in water level, feet	Percolation rate, inches per hour	Remarks
9:00	0	3.75	-		Filled with 6"
9:20	20	3.83	0.08		
9:40	20	3.91	0.08	2.88	
10:00	20	3.98	0.07	2.52	
10:20	20	4.04	0.06	2.16	
10:40	20	4.11	0.07	2.52	
11:00	20	4.17	0.06	2.16	
11:20	20	4.225	0.055	1.98	
					Adjusted to 6" level for Trial #2

Calculation is performed for each water level drop

= (Drop in water level/Time interval) x conversion

= 0.055ft/20min x (12in/ft) x (60min/hr)

= 1.98 inches per hour

The design infiltration rate of two successive trials shall have a difference of 5% or less.

APPENDIX E

Manufactured Treatment Technologies

APPENDIX E. MANUFACTURED TREATMENT TECHNOLOGIES

Manufactured treatment technologies are proprietary systems, developed to serve specific stormwater management needs. New technologies are always under development to meet the standards of urban stormwater pollutant control. Some manufactured treatment technologies are stand-alone systems and others must be used in conjunction with additional facilities (a "treatment train") in order to accomplish pollutant removal goals.

Oregon City relies on the City of Portland's submission and review protocols to establish a list of approved manufactured stormwater treatment technologies. Engineers wishing to use a manufactured treatment technology for proprietary treatment device for stormwater management should refer to the current version of the City of Portland's Stormwater Management Manual for a list of approved technologies. New technologies must gain approval from the City of Portland before being proposed for use in Oregon City.

APPENDIX F

Maintenance Covenant and Access Easement

After recording return to:

CITY RECORDER
PO BOX 3040
Oregon City, OR 97045
City Planning No.: fill in

Tax Map/Lot: _____
Drainage Area Served: _____

MAINTENANCE COVENANT AND ACCESS EASEMENT

THIS MAINTENANCE COVENANT AND ACCESS EASEMENT ("Agreement") is made this ___day of _____, 20___, between [FILL IN OWNERSHIP INFO] an [FILL IN COMPANY STATUS SUCH AS LLC] ("Developer"), and the CITY OF OREGON CITY, a municipal corporation of the State of Oregon formed pursuant to ORS Chapter 457 (the "City").

RECITALS

A. Developer is the owner and developer of certain real property located in the City of Oregon City, Clackamas County, Oregon, legally described on Exhibit A attached hereto and commonly known as [FILL IN PROPERTY INFO], OREGON CITY, OR 97045 (the "Development").

B. Developer has developed or will develop at the Development a stormwater management facility as further described below:

List the Type, Quantity, and Location of all stormwater management facilities proposed and constructed within the development.

C. The City has approved construction plans submitted by Developer for the Development, including the on-site stormwater facilities as described above (together with any other stormwater facilities that may hereafter be constructed on the Development, the "Stormwater Facilities").

D. To protect future lot owners in the Development, as well as owners of neighboring property, the City requires Developer to enter into this Agreement as a condition to the City's approval of construction plans, building permit(s), if applicable, and the final plat, if applicable, for the Development.

E. The Stormwater Facilities enable development of property while mitigating the impacts of additional surface water and pollutants associated with stormwater runoff prior to discharge from the property to the public stormwater system. The consideration for this Agreement is connection to the City's stormwater system.

F. The Stormwater Facilities are designed by a registered professional engineer to accommodate the anticipated volume of runoff and to detain and treat runoff in accordance with City's Stormwater and Grading Design Standards and its amendments.

G. Failure to inspect and maintain the Stormwater Facilities can result in an unacceptable impact to the public stormwater system.

AGREEMENT

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the City and Developer agree as follows:

1. **Covenant to Maintain and Repair**. Developer shall, at its sole expense, itself or through qualified independent contractors, at all times maintain the Stormwater Facilities in good working order, condition and repair, clear of all debris, and in compliance with all applicable state and local rules, regulations, and guidelines (including those adopted from time to time by the City and including the City's Stormwater and Grading Design Standards).

2. **Covenant to Inspect.** Developer shall perform annual inspections of all Stormwater Facilities covered by this agreement. The annual inspection required by this Agreement shall identify any work necessary to repair or maintain facilities in good working order. Developer shall provide Oregon City Public Works with annual maintenance inspection forms, including an identification of the corrective actions the Developer has taken in response to the annual inspection. See the City's Public Works Department Engineering Policies for appropriate inspection forms.

3. **Easement.** Developer hereby grants the City, its employees, independent contractors and designees, a nonexclusive easement for ingress and egress over, across and under the Development from time to time at the City's sole discretion to inspect, sample, and monitor components of the Stormwater Facilities and discharges therefrom, as well as allow the City to take the actions described in Sections 4 and 5 of this Agreement. Developer understands and agrees that this easement limits the ability of Developer, its successors and assigns from constructing any permanent buildings, structures, landscaping or other improvements that would interfere with the functioning of the Stormwater Facilities or the City's access to perform the inspection and maintenance required under this Agreement.

4. **Failure to Perform Covenant.** If the City, in its sole discretion, determines that Developer is not in compliance with the covenant described in Sections 1 and 2, except in the case of an emergency, the City or its designee shall give the Developer written notice to perform the maintenance and/or repair work specified in the notice. If such work is not performed to the City's satisfaction within seven (7) days after the date of such notice, or such other time as the City may, in its sole discretion, determine, the City, its employees, independent contractors and

designees may exercise their right under the Easement described in Section 3 of this Agreement to enter the Development to perform any and all work required bringing the Stormwater Facilities into compliance with this Agreement.

5. **Emergency**. If the City, in its sole discretion, determines that there exists or will likely exist an emergency on or about the Development with respect to the Stormwater Facilities, the City, its employees, independent contractors and designees may immediately exercise their rights under the Easement described in Section 3 of this Agreement to immediately enter the Development to perform any and all work required to bring the Stormwater Facilities into compliance with this Agreement, and in such case the City shall use reasonable efforts to notify the Developer prior to entering the Development. Notwithstanding the above, the work performed may consist only of avoiding or mitigating the emergency and/or cleaning and repairing the Stormwater Facilities to their original condition and standards.

6. **City Under No Obligation.** Developer, for itself and its successors and assigns (including all owners of lots in the Development), agrees that the City, as well as its departments, employees, independent contractors and/or designees shall have no obligation to exercise its rights under this Agreement, including the right under Sections 4 and 5 of this Agreement to perform the work required of the Developer, or to perform any other maintenance or repair of the stormwater facilities. Developer also agrees that none of the City, as well as its departments, employees, independent contractors and/or designees shall have any liability to Developer or any of Developer's successors or assigns (including owners of lots in the Development) in connection with the exercise or nonexercise of such rights, the maintenance or repair of the stormwater facilities, or the failure to perform the same.

7. **Developer Obligations**. In addition to the covenants and easement described above, Developer agrees to the following additional obligations.

a. Prior to the sale of any portion of the Development, Developer shall provide to the City's Public Works Department, a copy of the Operations and Maintenance Manual for the Stormwater Facilities, which shall include detailed diagrams and descriptions identifying the components and operations of the Stormwater Facilities.

b. Prior to final approval of the Development, developer shall record this document in the deed records of Clackamas County and provide a copy of the recorded document to the City.

c. Developer shall notify the City's Public Works Director in writing of the person responsible for compliance with Developer's obligations under this covenant ("Developer Designee"), and of any change in the Developer Designee. Developer expressly agrees that the Developer Designee shall have the authority to bind Developer, its successors and assigns with respect to the matters described in this Agreement.

d. Upon sale or transfer of the Development, or any portion thereof, including any lots in a subdivision, the Developer shall inform the purchaser of the obligations required under this Agreement.

8. **Reimbursement**. If the City exercises its right to enter the Development pursuant to the Easement described in Section 3 of this Agreement, Developer shall reimburse the City for all of its costs and expenses incurred in connection therewith within thirty (30) days after receipt of an invoice. If Developer fails to pay the invoiced amount within such period, such amount shall thereafter accrue interest at the statutory rate. Such amount, together with interest, shall be a lien on the Development (and each of the lots contained therein) which may be foreclosed in accordance with ORS Chapter 88. If the Development is owned by more than one person (i.e., multiple lot owners), each such owner shall be jointly and severally liable for payment of the amounts provided for in Section 3.

9. **Indemnification**. Developer agrees to indemnify, defend (with legal counsel reasonably acceptable to the City), and hold harmless the City, its employees, independent contractors and designees harmless from and against any liability, losses, costs, expenses (including reasonable attorney fees), claims or suits arising from Developer's failure to perform its obligations under this Agreements or the exercise of the City's rights under this Agreement.

10. **Run with the Land**. The parties' rights and obligations contained herein shall run with the land and shall be binding upon Developer and its successors and assigns (including, without limitation, subsequent owners of lots in the Development and any homeowner's association owning common areas in the Development). Those rights and obligations shall inure to the benefit of the City, as well as its successors and assigns.

11. **Attorney Fees.** If legal action is commenced in connection with this Agreement, the prevailing party in such action shall be entitled to recover its reasonable attorney fees and costs incurred in the trial court and in the appeal therefrom. The term "action" shall be deemed to include action commenced in the bankruptcy courts of the United States and any other court of general or limited jurisdiction.

12. **Assignment**. The obligations of Developer (and subsequent owners of lots in the Development) under this Agreement may not be assigned except (a) in connection with the sale of the property owned by such person (in which case the transferee will be deemed to assume such obligations), and (b) with the prior written consent of the City, to a homeowner's association that owns and maintains the common areas of the Development.

13. **Authority.** If Developer is an entity, the individual executing this Agreement on behalf of Developer represents and warrants to the City that he or she has the full power and authority to do so and that Developer has full right and authority to enter into this Agreement and perform its obligations under this Agreement.

IN WITNESS WHEREOF, Developer and the City have executed this instrument on the date first written above.

[Signature Page Follows]

DEVELOPER:	**CITY OF OREGON CITY**
_____ By:_____ [FILL IN NAME, TITLE AND ENTITY OF SIGNER, e.g., by John Smith, Member of Smith Family, LLC]	_____ By:_____ City Manager By: _____ Public Works Director

CITY

STATE OF OREGON)
) ss.
County of Clackamas)

This instrument was acknowledged before me on _____, by _____, as_____ of the City of Oregon City.

_____
Notary Public for Oregon
My Commission Expires _____

DEVELOPER

STATE OF OREGON)
) ss.
County of Clackamas)

This instrument was acknowledged before me on _____, by _____.

_____
Notary Public for Oregon
My Commission Expires _____

APPENDIX G

1851 Vegetation Conditions

1851 Vegetation

City Limits
Closed forest; Riparian and Wetland
Closed forest; Upland
Emergent wetlands
Savanna
Unvegetated
Water
Woodland

Date: Oct 30, 2014; Map: Vegetation Conditions 1851 - 11x17P.mxd; Plot: Vegetation Conditions 1851 - 11x17P - 20141030.pdf

APPENDIX H

Hydrograph Method Guidelines

APPENDIX H. HYDROGRAPH METHOD GUIDELINES

The Santa Barbara Urban Hydrograph (SBUH) method was developed by the Santa Barbara County Flood Control and Water Conservation District to determine a runoff hydrograph for an urbanized area. It is a simpler method than some other approaches, as it computes a hydrograph directly without going through intermediate steps (i.e., a unit hydrograph) to determine the runoff hydrograph.

The SBUH method is a popular method for calculating runoff, since it can be done with a spreadsheet or by hand relatively easily. The SBUH method can be used to calculate peak flows and runoff volumes for sizing conveyance systems or stormwater management facilities when flow-duration matching is not required.

Elements of the SBUH Method

The SBUH method depends on several variables:

- Design storm
- Pervious (A_p) and impervious (A_{imp}) land areas
- Time of concentration (Tc) calculations
- Runoff curve numbers (CN) applicable to the site

These elements shall all be presented as part of the submittal process. In addition, maps showing the pre-development and post-development conditions shall be presented to help in the review.

Design Storm

The SBUH method also requires a design storm to perform the runoff calculations. Oregon City uses a NRCS Type 1A 24-hour storm distribution. This storm is shown in **Figure H-1** at the end of this appendix. The depth of rainfall for the water quality design storm shall be 1.0 inches[1] in 24 hours. The depth of rainfall for the 2 through 100-year 24-hour storm events is shown below in **Table H-1.**

Table H-1. 24-hour Rainfall Depths in Oregon City

Recurrence Interval, Years	24-Hour Depth, Inches
2	2.8
10	3.5
25	4.0
50	4.4
100	4.5

Source: NOAA Atlas 2, Volume X

[1] The water quality design storm rainfall depth as documented in a technical memorandum: *Selection of Representative Rainfall Volume and Rainfall Intensities to result in Capture and Treatment of 80% of the Average Annual Runoff Volume*, Brown and Caldwell, May 11, 2010.

Land Area

The total area, including the pervious and impervious areas within a drainage basin, shall be quantified in order to evaluate critical contributing areas and the resulting site runoff. Each area within a basin shall be analyzed separately and their hydrographs combined to determine the total basin hydrograph. Areas shall be selected to represent homogenous land use/development units.

Time of Concentration

Time of concentration, Tc, is the time for a theoretical drop of water to travel from the furthest point in the drainage basin to the facility being designed. (In this case, Tc is derived by calculating the overland flow time of concentration and the channelized flow time of concentration.) Tc depends on several factors, including ground slope, ground roughness, and distance of flow. The following formula may be used for determining Tc.

$Tc = Tt_1 + Tc_2 + Tc_3 + \ldots + T_{cn}$

$Tt = L/60V$ (Conversion of velocity to travel time)

$Tt = \frac{0.42\ (nL)^{0.8}}{1.58(s)^{0.4}}$ (Manning's kinematic solution for sheet flow less than 300 feet)

For shallow concentrated flow across slopes less than 0.005 ft/ft:

$V = 16.1345(s)^{0.5}$ (Unpaved surfaces)

$V = 20.3282(s)^{0.5}$ (Paved surfaces)

Where,

T_t = travel time, minutes

T_c = total time of concentration, minutes (minimum T_c = 5 minutes)

L = flow length, feet

V = average velocity of flow, feet per second

n = Manning's roughness coefficient for various surfaces

s = slope of the hydraulic grade line (land or watercourse slope), feet per foot

When calculating T_c, the following limitations apply:

- Overland sheet flow (flow across flat areas that does not form into channels or rivulets) shall not extend for more than 300 feet.
- For flow paths through closed conveyance facilities such as pipes and culverts, standard hydraulic formulas shall be used for establishing velocity and travel time.
- Flow paths through lakes or wetlands may be assumed to be zero (i.e., T_c = 0).

Runoff Curve Numbers

Runoff curve numbers (CNs) were developed by the Natural Resources Conservation Service (NRCS) after studying the runoff characteristics of various types of land. CNs were developed to reduce diverse characteristics such as soil type, land usage, and vegetation into a single variable for doing runoff calculations. The runoff curve numbers approved for stormwater quantity/quality calculations are included as **Tables H-2 and H-3** of this appendix.

The curve numbers presented in **Tables H-2 and H-3** are for wet antecedent moisture conditions. Wet conditions assume previous rainstorms have reduced the capacity of soil to absorb water. Given the frequency of rainstorms in the Portland area, wet conditions are most likely, and give conservative hydrographic values.

Hydrologic Soil Group descriptions, critical to determining the appropriate curve numbers are included in **Table H-4**.

Table H-2. Runoff Curve Numbers for Urban Areas*

Cover Descriptions	Average Percent Impervious Area	Curve Numbers for Hydrologic Soil Group			
Cover Type and Hydrologic Condition		A	B	C	D
Open space (lawns, parks, golf courses, cemeteries, etc.)					
Poor condition (grass cover <50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads					
Paved: curbs and stone sewers (excluding right-of-way)		98	98	98	98
Paved: open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Urban districts					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82

**Soil Conservation Service, Urban Hydrology for Small Watersheds, Technical Release 55, pp. 2.5-2.8, June 1986.*

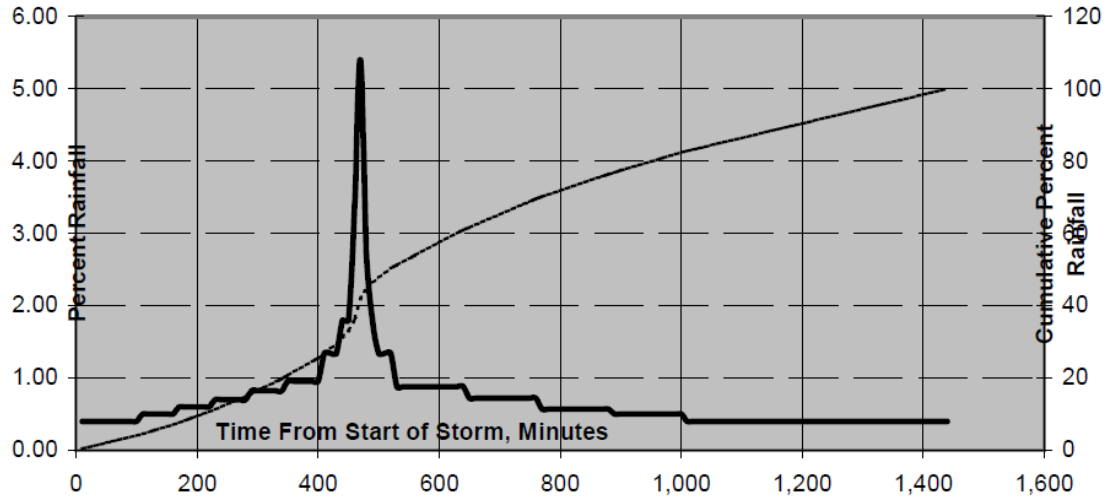
Table H-3. Runoff Curve Numbers for Other Agricultural Areas*

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range-continuous forage for grazing					
<50% ground cover or heavily grazed with no mulch	Poor	68	79	86	89
50 to 75% ground cover and not heavily grazed	Fair	49	69	79	84
>75% ground cover and lightly or only occasionally grazed	Good	39	61	74	80
Meadow-continuous grass, protected from grazing and generally mowed for hay	-	30	58	71	78
Brush--weed-grass mixture with brush as the major element					
<50% ground cover	Poor	48	67	77	83
50 to 75% ground cover	Fair	35	56	70	77
>75% ground cover	Good	30	48	65	73
Woods-grass combination (orchard or tree farm)	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Cover type	Hydrologic condition	A	B	C	D
Woods					
Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.	Poor	45	66	77	83
Woods are grazed but not burned, and some forest litter covers the soil.	Fair	36	60	73	79
Woods are protected from grazing, and litter and brush adequately cover the soil.	Good	30	55	70	77

*Soil Conservation Service, *Urban Hydrology for Small Watersheds*, Technical Release 55, pp. 2.5-2.8, June 1986.

Table H-4. NRCS Hydrologic Soil Group Descriptions

NRCS Hydrologic Soil Group	Description
Group A	Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.
Group B	Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
Group C	Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.
Group D	Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a fragipan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.



Time From Start of Storm, Minutes		% Rainfall	Cumulative % Rainfall
0 -	10	0.40	0.40
10 -	20	0.40	0.80
20 -	30	0.40	1.20
30 -	40	0.40	1.60
40 -	50	0.40	2.00
50 -	60	0.40	2.40
60 -	70	0.40	2.80
70 -	80	0.40	3.20
80 -	90	0.40	3.60
90 -	100	0.40	4.00
100 -	110	0.50	4.50
110 -	120	0.50	5.00
120 -	130	0.50	5.50
130 -	140	0.50	6.00
140 -	150	0.50	6.50
150 -	160	0.50	7.00
160 -	170	0.60	7.60
170 -	180	0.60	8.20
180 -	190	0.60	8.80
190 -	200	0.60	9.40
200 -	210	0.60	10.00
210 -	220	0.60	10.60
220 -	230	0.70	11.30
230 -	240	0.70	12.00
240 -	250	0.70	12.70
250 -	260	0.70	13.40
260 -	270	0.70	14.10
270 -	280	0.70	14.80
280 -	290	0.82	15.62
290 -	300	0.82	16.44
300 -	310	0.82	17.26
310 -	320	0.82	18.08
320 -	330	0.82	18.90
330 -	340	0.82	19.72
340 -	350	0.95	20.67
350 -	360	0.95	21.62
360 -	370	0.95	22.57
370 -	380	0.95	23.52
380 -	390	0.95	24.47
390 -	400	0.95	25.42
400 -	410	1.34	26.76
410 -	420	1.34	28.10
420 -	430	1.34	29.44
430 -	440	1.80	31.24
440 -	450	1.80	33.04
450 -	460	3.40	36.44
460 -	470	5.40	41.84
470 -	480	2.70	44.54
480 -	490	1.80	46.34
490 -	500	1.34	47.68
500 -	510	1.34	49.02
510 -	520	1.34	50.36
520 -	530	0.88	51.24
530 -	540	0.88	52.12
540 -	550	0.88	53.00
550 -	560	0.88	53.88
560 -	570	0.88	54.76
570 -	580	0.88	55.64
580 -	590	0.88	56.52
590 -	600	0.88	57.40
600 -	610	0.88	58.28
610 -	620	0.88	59.16
620 -	630	0.88	60.04
630 -	640	0.88	60.92
640 -	650	0.72	61.64
650 -	660	0.72	62.36
660 -	670	0.72	63.08
670 -	680	0.72	63.80
680 -	690	0.72	64.52
690 -	700	0.72	65.24
700 -	710	0.72	65.96
710 -	720	0.72	66.68
720 -	730	0.72	67.40
730 -	740	0.72	68.12
740 -	750	0.72	68.84
750 -	760	0.72	69.56
760 -	770	0.57	70.13
770 -	780	0.57	70.70
780 -	790	0.57	71.27
790 -	800	0.57	71.84
800 -	810	0.57	72.41
810 -	820	0.57	72.98
820 -	830	0.57	73.55
830 -	840	0.57	74.12
840 -	850	0.57	74.69
850 -	860	0.57	75.26
860 -	870	0.57	75.83
870 -	880	0.57	76.40
880 -	890	0.50	76.90
890 -	900	0.50	77.40
900 -	910	0.50	77.90
910 -	920	0.50	78.40
920 -	930	0.50	78.90
930 -	940	0.50	79.40
940 -	950	0.50	79.90
950 -	960	0.50	80.40
960 -	970	0.50	80.90
970 -	980	0.50	81.40
980 -	990	0.50	81.90
990 -	1000	0.50	82.40
1000 -	1010	0.40	82.80
1010 -	1020	0.40	83.20
1020 -	1030	0.40	83.60
1030 -	1040	0.40	84.00
1040 -	1050	0.40	84.40
1050 -	1060	0.40	84.80
1060 -	1070	0.40	85.20
1070 -	1080	0.40	85.60
1080 -	1090	0.40	86.00
1090 -	1100	0.40	86.40
1100 -	1110	0.40	86.80
1110 -	1120	0.40	87.20
1120 -	1130	0.40	87.60
1130 -	1140	0.40	88.00
1140 -	1150	0.40	88.40
1150 -	1160	0.40	88.80
1160 -	1170	0.40	89.20
1170 -	1180	0.40	89.60
1180 -	1190	0.40	90.00
1190 -	1200	0.40	90.40
1200 -	1210	0.40	90.80
1210 -	1220	0.40	91.20
1220 -	1230	0.40	91.60
1230 -	1240	0.40	92.00
1240 -	1250	0.40	92.40
1250 -	1260	0.40	92.80
1260 -	1270	0.40	93.20
1270 -	1280	0.40	93.60
1280 -	1290	0.40	94.00
1290 -	1300	0.40	94.40
1300 -	1310	0.40	94.80
1310 -	1320	0.40	95.20
1320 -	1330	0.40	95.60
1330 -	1340	0.40	96.00
1340 -	1350	0.40	96.40
1350 -	1360	0.40	96.80
1360 -	1370	0.40	97.20
1370 -	1380	0.40	97.60
1380 -	1390	0.40	98.00
1390 -	1400	0.40	98.40
1400 -	1410	0.40	98.80
1410 -	1420	0.40	99.20
1420 -	1430	0.40	99.60
1430 -	1440	0.40	100.00

Figure H-1. NRCS 24-Hour Type 1A Hyetograph

Erosion Prevention and Sediment Control

Planning and Design Manual



WATER ENVIRONMENT SERVICES

Beyond clean water.

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CLACKAMAS COUNTY

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EROSION PREVENTION
AND
SEDIMENT CONTROL

PLANNING AND DESIGN MANUAL

Developed in Partnership with:

City of Gladstone

City of Happy Valley

City of Lake Oswego

City of Milwaukie

City of Oregon City

City of West Linn

City of Wilsonville

Clean Water Services (CWS)
Of Washington County

Oak Lodge Sanitary District

Water Environment Services (WES)
Of Clackamas County

Revised
December 2008

PREFACE

This Erosion Prevention and Sediment Control Planning and Design Manual was developed through a partnership between Clackamas County Water Environment Services, Clean Water Services, Oak Lodge Sanitary District and the cities of Gladstone, Happy Valley, Lake Oswego, Milwaukie, West Linn and Wilsonville.

The purpose of the manual is to provide a comprehensive and detailed approach towards controlling erosion on construction sites. It has been updated to include the latest information regarding materials and installation practices. There are numerous other resources available and readers are encouraged to refer to the reference document listed in Appendix D.

DISCLAIMER

The Erosion Prevention and Sediment Control Planning and Design Manual was developed for the sole purpose of providing the most updated Erosion, Prevention, Run-off, and Sediment Controls Best Management Practices (BMP's). The contents of this manual should not be interpreted as necessarily representing the policies or recommendations of other referenced agencies or organizations.

The mention of trade names, products or companies does not constitute an endorsement.

The previous revision of this manual was December 2000. Periodic updates will be made as materials, practices, and policies change within the industry and are made available.

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CHAPTER 1
BACKGROUND

1.1 Introduction

When land is disturbed at a construction site, the erosion rate accelerates dramatically. Since ground cover on an undisturbed site protects the surface, removal of that cover increases the site's susceptibility to erosion. Disturbed land may have an erosion rate 1,000 times greater than the pre-construction rate. Even though construction requires that land be disturbed and be left bare for periods of time, proper planning and use of erosion prevention measures can reduce the impact of human-induced, accelerated erosion.

The major problem associated with erosion on a construction site is the movement of soil off the site and its impact on water quality. Millions of tons of sediment are generated annually by the construction industry in the United States. The rate of erosion on a construction site varies with site conditions, climate, and soil types, but is typically 100 to 200 tons per acre and may be as high as 500 tons per acre.

Sediment in streams is a contributing factor in the decline of Salmonid populations in our region. Sediment fills in clean gravel which spawning fish need. The increased turbidity impairs the feeding ability of fish and can also clog gill passages. Sediment laden waters leaving construction sites and entering streams, constitutes a "take" under the Endangered Species Act. This harming and harassing of the salmon leaves the permittee prone to third party lawsuits by special interest groups, not to mention fines from, DEQ, NMFS, and ODFW.

Erosion prevention measures are more effective than the reactive control of sediment. Once soil particles become dislodged, it requires greater efforts and costs to contain the sediment on the site. Sediment leaving the site may damage neighboring properties, block drainage systems, and enter roadways. Local government budgets must pay for removing the sediment from these streets, sewers, ditches, and culverts.

Identifying erosion problems at the planning stage and noting highly erodible areas helps in selecting cost effective, environmentally sensitive erosion control measures. This manual focuses primarily on the prevention of sedimentation associated with water and wind generated soil erosion.

An important concept to keep in mind when developing erosion control plans: ***construction practices, which minimize the amount of disturbed land area and avoid or minimize work on steep slopes, are encouraged***. Such practices can provide the following positive results:

- Less chance of soil washing off the site onto streets, drainage systems, and adjacent properties.
- The number and size of erosion control measures required will be minimized.
- The overall cost of maintaining erosion and sediment control facilities are minimized.
- As much top soil as possible is retained on the site, making revegetation and landscaping easier to establish.

Water pollution in the United States is regulated under the Clean Water Act (CWA) of 1972. In 1987, Congress amended the CWA to include nonpoint sources of pollution. Nonpoint pollution occurs when runoff from land carries pollutants to receiving waters. Section 402 of the CWA provides the legal basis for the National Pollution Discharge Elimination System (NPDES) permit program, which regulates point and nonpoint discharges.

The U.S. Environmental Protection Agency (EPA) has delegated the implementation of the National Pollution Discharge Elimination System (NPDES) program to the state of Oregon. The Oregon Department of Environmental Quality (DEQ) administers the NPDES program through Oregon Revised Statute (ORS) 468B and associated Oregon Administrative Rules (OAR). ORS 468B.025 explicitly prohibits the discharge or placement of wastes into waters of the state, prohibits the discharge of waste that causes violations of water quality standards, and prohibits violations of permit conditions.

1.2 Background and Policies

It is the local jurisdiction's goal to comply with all conditions of the NPDES permit and other Federal, State, County, and City regulations or requirements. This permit addresses sediment discharge in storm water runoff from construction projects, which disturb one acre or more as part of a statewide mandate. Most jurisdictions require a local permit on projects that disturb 500 square feet or more (threshold varies by jurisdiction). In addition, erosion and sediment control measures must be installed prior to any disturbance.

In general, the Department of Environmental Quality (DEQ) issues the NPDES 1200-C permit, but through a Memo of Agreement (MOA), some local jurisdictions serve as Agents of DEQ and/or issue a joint permit for projects within their jurisdiction.

Under existing planning and permitting requirements, the owner/permittee must assure its actions do not harm, jeopardize, threatened, or endangered species. In addition, owner/permittee shall implement conservation measures, or reasonable and prudent measures identified by the U.S. Fish and Wildlife Services and the National Marine Fisheries Services, to avoid and minimize potential adverse effects to such species.

The owner/permittee shall be aware of, and adhere to, any limitations in the work area imposed by environmental permits such as the Division of State Lands (DSL), and U.S. Army Corps of Engineers (USACE) removal/fill permit.

As a general rule of thumb, the owner/permittee should submit a work schedule and plan that indicates planned implementation of temporary and permanent erosion control measures, including shutdown procedures for winter and other work interruptions.
General design and construction considerations are as follows.

- Plan, site, and develop in a manner that minimizes impacts and protects areas that provide important water quality benefits or are particularly susceptible to erosion or sediment loss.
- Minimizing land disturbance such as clearing and grading and cut and fill to reduce erosion and sediment loss.

- Where applicable and appropriate, locate construction pollutant sources (including sediment) away from drainage swales, wetlands, or water bodies.
- Cut and fill slopes will be as flat as practicable and consistent with soil stability. Slopes of 2:1 or steeper may require special design.
- Sediment removed from sediment control facilities should be placed in non-critical flat areas of the site. In no instances should the removed sediment be placed in a position where subsequent rainfall could return it to the sediment control devices.

Approval of a construction erosion and sediment control plan by the permitting authority does not relieve the applicant's responsibility to ensure that erosion control measures are constructed and maintained to contain sediment on the construction site.

1.3 National Pollution Discharge Elimination System (NPDES) Permit Requirements

As the administrator of the NPDES permit, DEQ or its designee has the authority to grant permits for construction activities clearing, grading, excavation, and stockpiling.

Potential pollutant sources covered by this permit include those released through construction activities performed under the authority or jurisdiction of the public agency. Until the permit expires or is modified or revoked, the permittee or the permittee's contractor is authorized to construct, install, modify, or operate erosion and sediment control measures and storm water treatment and control facilities, and to discharge storm water to public waters in conformance with all the requirements, limitations, and conditions set forth within the NPDES permit. Measures used to conform to the 1200-C permit are called Best Management Practices (BMP's). Unless authorized by another NPDES permit, all other direct and indirect discharges to public waters are prohibited. The primary NPDES mandated controls, limitations and plan requirements are as follows.

1. The permittee shall ensure that an adequate Erosion and Sediment Control Plan (ESCP) is prepared and implemented for each construction activity regulated by this permit and under the authority or jurisdiction of the permittee.
2. A copy of the ESCP for each construction activity shall be retained on-site and made available to the DEQ, or its designee. During inactive periods of greater than seven consecutive calendar days, the ESCP shall be retained by the permittee.
3. The ESCP shall be developed and implemented to prevent the discharge of significant amounts of sediment to surface waters. Under the NPDES 1200-C permit, the following observations are considered significant.
   a. Earth slides or mud flows that leave the construction site and are likely to discharge to surface waters.
   b. Evidence of concentrated flows of water causing erosion when such flows are not filtered or settled to remove sediment prior to leaving the construction site and are likely to discharge to surface waters. Evidence includes the presence of rills, gullies, or channels. Flow to storm water inlets or catch basins located on the site will be considered "leaving the site" if there are no sediment control structures downstream of the inlets or catch basins that are under the permittee's control.

c. Turbid flows of water that are not filtered or settled to remove sediment prior to leaving the construction site and are likely to discharge to surface waters. Flow to storm water inlets or catch basins located on the site will be considered "leaving the site" if there are no sediment control structures downstream of the inlets or catch basins that are under the permittee's control.
d. Deposits of sediment at the construction site in areas that drain to unprotected storm water inlets or catch basins that discharge to surface waters. Inlets and catch basins with failing sediment controls due to lack of maintenance or inadequate design will be considered unprotected.
e. Deposits of sediment from the construction site on public or private streets outside of the permitted construction activity that are likely to discharge to surface waters.
f. Deposits of sediment from the construction site on any adjacent property outside of the permitted construction activity that are likely to discharge to surface waters.

4. DEQ or its designee may require modifications to the ESCP at any time if the ESCP is ineffective at preventing the discharge of significant amounts of sediment to surface waters.
5. Significant amounts of sediment that leave the site shall be cleaned up within 24 hours and placed back on the site or disposed of properly. Any in-stream clean up shall be coordinated with the DSL.
6. Under no conditions shall sediment from the construction site be washed into storm drain sewers or drainage ways.
7. Each ESCP shall include any procedures necessary to meet local erosion and sediment control requirements or storm water management requirements.
8. Each ESCP shall also include, at a minimum, a site description, site map, required controls and practices, additional controls and practices, inspection requirements, inspection requirements for inactive or inaccessible sites, and written records.

The penalties for water pollution and permit condition violations are as follows.

- Oregon Law (ORS 468.140) allows the Director (DEQ) to impose civil penalties up to $10,000 per day for violation of a term, condition, or requirement of a permit.
- Under ORS 468.943, unlawful water pollution, if committed by a person with criminal negligence, is punishable by a fine of up to $25,000 or by imprisonment for not more than one year, or by both. Each day on which a violation occurs or continues is a separately punishable offense.
- Under ORS 468.946, a person who knowingly discharges, places or causes to be placed any waste into the waters of the State or in location where the waste is likely to escape into the waters of the State, is subject to a class B felony punishable by a fine not to exceed $200,000 and up to 10 years in prison.

A detailed report of the 1200-C regulations can be obtained on the DEQ web site.

1.4 Additional Water Quality Requirements

Statewide, additional water quality requirements are in place or are being developed for:

- Total Maximum Daily Loads (TMDLS) – set the amount of certain pollutants a waterway can receive without violating water quality standards. A plan is then developed and put in to place to reduce the levels of these pollutants.
- Turbidity Standards – Turbidity is a measure of cloudiness in water. It can be caused by soil erosion, water discharge and runoff. High turbidity levels mean that water bodies contain a denser amount of particles. Turbidity may adversely affect a wide range of aquatic species, including endangered fish.
- Underground Injection Control (UIC) – rules for subsurface drainage systems that are designed to distribute storm and surface water below the ground surface (e.g. drywells/sumps, certain types of "French drains", etc.). These rules are associated with the Safe Drinking Water Act and are designed to help protect aquifers from contamination.

These requirements are likely to have a significant impact on erosion prevention and sediment control requirements. More information is available on the DEQ website and through your local jurisdiction.

1.5 Other Agencies and Acts

During the planning process, designer should coordinate meetings with other private groups and public agencies or jurisdictions that may either have an interest in, or control of the impacts of proposed development. This process provides a means for other interested parties to supply input regarding erosion and sediment controls, environmentally sensitive areas, and other regulated activities.

The development of an ESCP spans the entire planning, design, and construction stages of a project. To be successful, it is imperative that communication among the interested parties be established and maintained throughout each stage of development and in accordance with Federal, State, and local agencies and acts. Some of the principle agencies and acts are described in the following sections.

1.5.1 Endangered Species Act

In March of 1999, winter steelhead and spring Chinook were listed as threatened in the Tualatin Basin. Previously listed aquatic species include the northwestern pond turtle and the red-legged frog. Erosion of soil from an unstable landscape can dramatically impact the habitat and survival of these species. Under ESA, the "take" of a species is prohibited. The term "take" includes: to harass, harm, kill, or injure the listed species. Any act that modifies or degrades their habitat in a manner that significantly impairs essential behavioral patterns such a breeding, spawning, rearing, migrating, feeding or sheltering and results in death or injury to a protected species is considered harmful.

Permitting or participating in construction that occurs in such a way and at such a time that sedimentation significantly impairs salmon survival might be construed as a "take." The more direct connection between what the government entity authorizes (or fails to enforce) the

contractors actions (or failure to act) and the injury to the species, the more likely that the parties could be held responsible for a “take.”

1.5.2 Title 3

The goal of the Stream and Floodplain Protection Plan (Title 3) is to protect the region's health and public safety by reducing flood and landslide hazards, controlling soil erosion, and reducing pollution of the region’s waterways.

Title 3 specifically implements the Oregon Statewide Land Use Goals 6 and 7 by protecting streams, rivers, wetlands, and floodplains by avoiding, limiting or mitigating the impact on these areas from development.

Title 3 contains performance standards to protect against flooding. The standards limit development in a manner that requires balanced cut and fill and floor elevations at least one foot above the flood hazard standard. The areas subject to these requirements have been mapped and adopted by Metro Council. The areas are the FEMA 100-year floodplain and the area of inundation for the February 1996 flood.

The purpose of these standards is to protect and allow enhancement of water quality. The water quality areas are rivers and streams with a protected vegetated corridor width depending on the slope of the stream and the number of acres drained by the stream. The performance standards require erosion and sediment control, planting of native vegetation on the stream banks when new development occurs, and prohibition of the storage and uses of hazardous material in water quality areas.

Finally, the functional plan directs Metro to establish performance standards to protect regionally significant fish and wildlife habitat areas. Those seeking to develop sites within these sensitive areas must contact their local jurisdictions to determine buffer width.

1.5.3 Other Interest Groups & Citizens

Citizen advisory committees, friends groups and neighborhood associations are taking a more active role with growth of their communities. Civic and environmental values have become an integral part of the land use process. This partnering with local governments has created a more responsive method for planning urbanization and protecting the natural features that add to the livability of our watersheds.

Watershed restoration is an excellent way to enhance community volunteerism in our rapidly urbanizing areas. Local municipalities have developed an advantageous working relationship with civic-minded groups.

The US EPA has identified erosion as the single largest cause of impaired water quality in rivers. The need for increased erosion control measures, and the enforcement thereof, has been

established. Communities taking ownership of their local watersheds, has proven advantageous to the environment.

1.5.4 Department of State Lands (DSL)

Division of State Lands (DSL) was first established in 1878 as the Office of the Clerk of the Land Board and is one of Oregon's oldest state agencies. It was renamed and elevated to Executive Agency status by the 1967 State Legislature. DSL manages the state's submerged and submersible lands under navigable rivers, lakes, estuaries, and the territorial sea to maintain fisheries, commerce, recreation, and navigation.

DSL is a regulatory agency, responsible for administration of Oregon's Removal-Fill Law. That law, enacted in 1967, is intended to protect, conserve and allow the best use of the state's water resources. A permit is required from DSL to remove, fill or alter more than 50 cubic yards of material within the bed or banks of waters of the state.

Exceptions are in State Scenic Waterways and areas designated essential salmon habitat, where a permit is required for all in-stream activity, regardless of size.

DSL also is responsible for Oregon's wetlands program. This includes maintenance of a statewide wetland inventory, providing public information and technical assistance about wetlands to local governments and landowners, and providing wetland conservation grants to local governments conducting detailed wetland inventories.

1.5.5 United States Army Corps of Engineers (USACOE)

Army Corps of Engineers (ACOE), principal engineering component of the United States Army, dates from June 16, 1775, when the Continental Congress authorized a chief engineer and two assistants for the army. They prepared the fortifications for the Battle of Bunker Hill. The engineers were permanently organized into a corps in 1802.

The present work of the corps is divided between military and civil projects. The program currently includes construction for the army and air force and environmental restoration of areas contaminated by toxic wastes. The civil program centers on development of water resources, including navigation improvement, hydroelectric power, flood control, recreation, and conservation of fish and wildlife. When requested, the corps provides engineering expertise to other agencies, state and local governments. The work ranges from constructing wastewater treatment plants and space launch facilities to other complex engineering tasks. Engineering professionals help remove toxic wastes and help other nations with the damage caused by disasters and wars.

DSL and ACOE have developed a joint permit application process. Although the regulatory authorities of DSL and ACOE are different, their roles, when considered together, include protecting navigable waters (and the ocean), ensuring wise and beneficial water use, maintaining and enhancing water quality, protecting fish and wildlife habitat and recreation resources, and in general, protecting the public interest.

Joint permit applications, after receipt, are forwarded to the DEQ, or its designee for review to ensure that it does not endanger Oregon's streams and wetlands and to confirm that the plans meet water quality laws and standards. Frequently, applicants are required to incorporate protective measures into their construction and operational plans, such as bank stabilization, treatment of storm water runoff, spill protection, and fish and wildlife protection.

1.5.6 United States Department of Agriculture (USDA)

The U.S. Department of Agriculture (USDA) offers landowners financial, technical, and educational assistance to implement conservation practices on privately owned land. Using this help, farmers, ranchers, and forest landowners apply practices that reduce soil erosion, improve water quality, and enhance cropland, forest land, wetlands, grazing lands, and wildlife habitat. Incentives offered by USDA promote sustainable agricultural and forestry practices, which protect and conserve valuable farm and forest land for future generations. USDA assistance also helps individuals and communities restore natural resources after floods, fires, or other natural disasters.

1.5.7 Natural Resources Conservation Service (NRCS)

The Natural Resources Conservation Service (NRCS), formerly called the Soil Conservation Service, was born of adversity, a national response to the Dust Bowl catastrophe of the mid-1930's. The agency's first chief, Hugh Hammond Bennett, spoke eloquently for the land when he convinced Congress that soil erosion was a national menace, that a permanent agency was needed within the Department of Agriculture to call landowners' attention to their land stewardship opportunities and responsibilities, that a nationwide partnership of Federal agencies with local communities was needed to help farmers and ranchers conserve their land.

NRCS is the U.S. Department of Agriculture's lead conservation agency. Its partners include conservation districts, state and federal agencies, NRCS Earth Team volunteers, agriculture and environmental groups, and professional societies. The strength of NRCS is in its workforce. They are based out of county, state, regional, and national offices and specialize in soil science, soil conservation, agronomy, biology, agroecology, range conservation, forestry, engineering, geology, hydrology, cultural resources, and economics.

1.5.8 Soil & Water Conservation District (SWCD)

The first SWCD in Oregon was established in Tillamook County in 1941. Presently there are forty-five conservation districts in Oregon, providing services to private landowners and managers statewide. There is at least one conservation district in each Oregon County. Soil and Water Conservation Districts are political subdivisions of state government and are under the administrative oversight authority of the Oregon Department of Agriculture. When the first conservation districts were formed, their focus was on soil erosion control in rural areas. Once considered primarily agriculturally oriented, many conservation districts are now actively

involved in urban water quality and quantity issues, such as land uses and run off from construction sites, and in providing assistance to landowners with just a few acres.

Perhaps the most important responsibility of the Soil and Water Conservation District is to conduct research relating to the character of soil erosion, the character of flood water and sediment damage. They also develop comprehensive plans and specifications for the conservation of soil resources and for the continued control and prevention of soil erosion.

1.5.9 Oregon Department of Fish and Wildlife (ODFW)

The Oregon Department of Fish & Wildlife is made up of predominately fish and wildlife biologists. Their main responsibility is to protect all fish and wildlife as well as their habitat throughout the entire State of Oregon. Their key audiences are fishing & hunting license holders, unorganized wildlife enthusiasts organized conservation groups, legislators and the media. ODFW has the authority to seek damages in a court of competent jurisdiction for the value of fish and wildlife injured or killed as the result of pollution or violation of the condition of any permit. The damages could include all costs for restoring the production of fish and wildlife in the affected areas

ODFW will also works cooperatively with other state and federal agencies to eliminate sources of pollution or other environmental damage, to prevent natural resource losses through educational efforts and through enforcement of anti-pollution and other environmental laws, and to ensure that violations of anti-pollution and other environmental laws are pursued to the fullest extent of the law.

1.5.10 National Marine Fisheries Service (NMFS)

The National Marine Fisheries Service (NMFS) is a part of the National Oceanic and Atmospheric Administration (NOAA). NMFS administers NOAA's programs to conserve, protect and manage living marine resources. The Protected Resources Division (PRD), located in Portland, Oregon, provides program oversight, and regional policy guidance on the conservation of at-risk anadromous, estuarine, and marine fishes in the NMFS Northwest Region. The PRD staff includes biologists, natural resource specialists, and policy analysts who work in conjunction with other NMFS programs to help administer provisions of the Endangered Species Act (ESA).

NMFS is dedicated to the protection of marine resources including salmon and trout that live at least part of their lives at sea. Due to declining numbers, certain populations have been listed as endangered or threatened under the Endangered Species Act. The ESA protects these fish and the habitats they depend on as they migrate to and from the Pacific Ocean. Along with federal protection under the ESA, state laws apply additional safeguards for the fish and their habitats.

Protection of water quality sensitive areas and restoration of vegetated corridors are important because once protective regulations enacted through the ESA are issued, NMFS requires that all

parties must avoid killing or harming a listed species, and avoid adverse affects to the habitat that supports listed species.

1.5.11 Oregon Department of Forestry (ODF)

The ODF manages several programs which protect the States forest lands and ensure a plentiful natural resource. The Department's largest program protects the 28,289,000 acres of forest land from wild fire. The Forest Practices program assures the growing and harvesting of forest tree species and maintenance of forest land for forest purposes are the primary uses of privately owned forest lands. The program also assures that forest practices are consistent with the sound management of soil, air, water, fish, and wildlife resources. Like many of the other environmental agencies, the ODF provides technical and financial assistance. By providing this service, it helps to mitigate Oregon's future timber supply shortage while it promotes forest health. It also enhances and protects critical natural resource values such as fish and wildlife habitat, soils, air, water, recreation, and aesthetics on non-federal forest land.

CHAPTER 2

EROSION PROCESSES

2.1 Concepts of Erosion and Sedimentation

Erosion is a natural process by which soil and rock material is loosened and transported. Erosion by the action of water, wind, and ice has produced some of the most spectacular landscapes. Natural erosion occurs primarily on a geologic timescale, but when human activities alter the landscape the process of erosion can be greatly accelerated. Construction site erosion causes serious and costly problems, both on-site and off-site. Waterborne soil erosion process begins by water falling as raindrops and flowing over bare soil surface.

When land is disturbed at a construction site, the erosion rate accelerates dramatically. Since ground cover on an undisturbed site protects the surface, the removal of that cover increases the site's susceptibility to erosion. Disturbed land may have an erosion rate 1,000 times greater than the pre-construction rate. Even though the process of construction requires that land be left bare for periods of time, proper planning and use of erosion prevention measures can reduce the impact of accelerated erosion caused by land development.

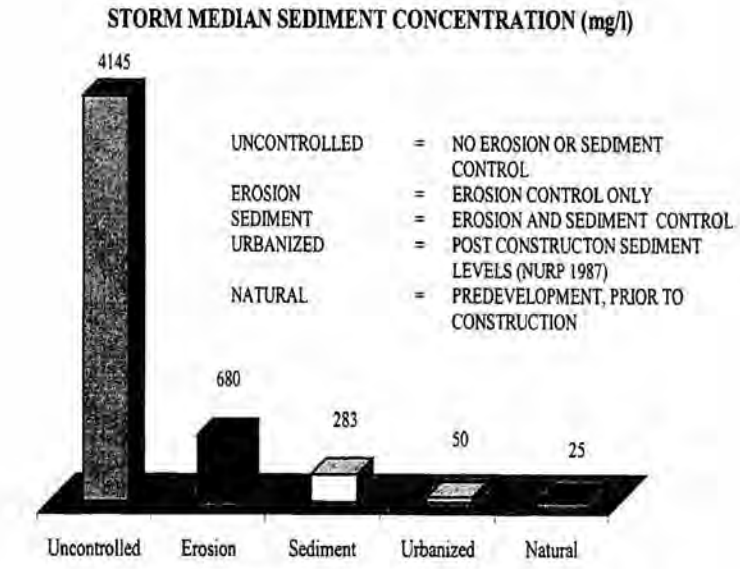


Figure 2-1 Absence of surface cover increases the soil susceptibility to erosion

When combined with an understanding of basic erosion control and sedimentation processes, fundamental erosion prevention and sediment control principles will provoke the groundwork for successfully implementing an erosion and sediment control plan. Soils, topography, and drainage patterns of a specific site influence the potential for soil erosion from that area. Identifying potential erosion problems at the planning stage and recognizing highly erodible areas help in selecting effective erosion control practices and estimating storage volumes needed for sediment traps and basins.

2.1.1 Types of Erosion

Erosion is often described as the detachment of soil particles by some force. This force may be due to rainfall, wind, or other forces. Once detachment occurs, the particles are transported. This is most often caused by water action, although wind can also be a major contributor.

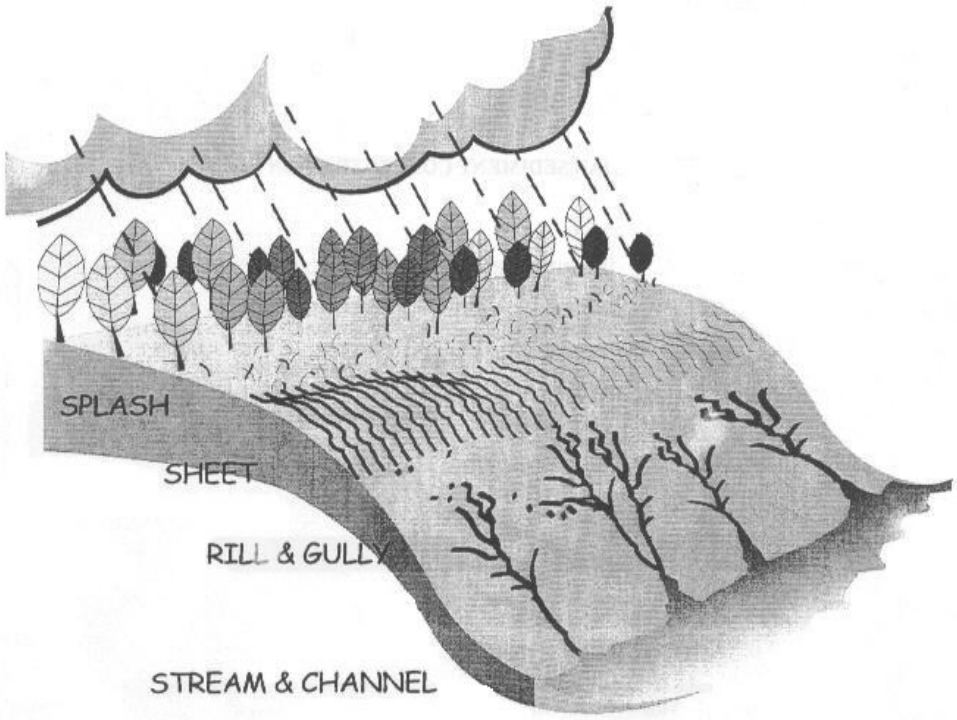


Figure 2-2 Major types of soil erosion

2.1.1.1 Water Erosion

The major types of water erosion are:

Splash – When vegetative cover is stripped away, the soil surface is directly exposed to raindrop impact. Splash erosion results when the force of raindrops falling on bare or sparsely vegetated soil detaches soil particles that can easily be transported by runoff. This pounding action destroys the soil structure and often a hard crust forms when the soil dries. This crust inhibits water infiltration and plant establishment, increasing runoff and future erosion.

Sheet – The removal of exposed surface soil can be caused by the action of unchanneled surface runoff. Shallow "sheets" of water flowing over the soil surface cause sheet flow. Sheet flow transports soil particles that have been detached by splash erosion. The shallow surface flow

rarely moves as a uniform sheet for more than a few feet before concentrating in the surface irregularities.

Rill – As surface flow changes from sheet flow to deeper concentrated flow along the low spots of the soil surface it creates rivulets, cutting grooves called rills into the soil surface. The energy of this concentrated flow is able to both detach and transport soil particles. The rills are small but well-defined channels that are at most only a few inches deep.

Gully – Some gullies are formed when runoff cuts rills deeper and wider or when the flows from several rills come together and form a large channel. Gullies can enlarge in both uphill and downhill directions. If the flow of water is sufficient, large chunks of soil can fall from a gully headwall in a process called mass wasting. Once a gully is created, it is very difficult to control, and costly to repair.

Channel – When stream bank vegetation is disturbed or when the velocity or volume of a stream is increased, channel erosion can occur. Natural streams have adjusted over time to the quantity and velocity of runoff that normally occurs within a watershed. The vegetation and rocks lining the banks are sufficient to prevent erosion under these steady-state conditions. When a watershed is altered by removing vegetation, by increasing the amount of impervious surfaces, or by paving tributaries, stream flows are changed. Increased volume and velocity of runoff may cause expansion of gullies into well-defined channels. These changes can disturb the equilibrium of the stream and cause channel erosion to begin. Channel erosion is commonly found at stream bends, constrictions where installed structures control the stream flow, or discharge points where storm drain culverts release storm water into a stream.

2.1.1.2 Wind Erosion

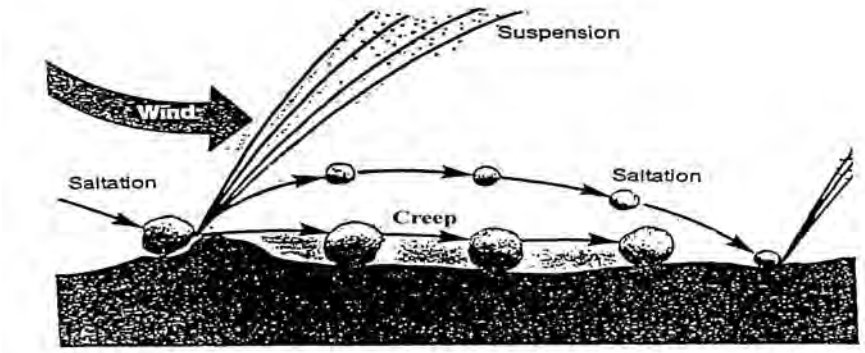
Wind erosion is a form of erosion occurring in flat, bare areas: dry, sandy soils, or where the soils are loose, dry, and finely granulated. Wind erosion damages land and natural vegetation by removing soil from one place and depositing it in another. It causes soil loss, dryness and deterioration of soil structure, nutrient and productivity losses, air pollution and sediment transport and deposition. Soil movement is initiated as a result of wind forces exerted against the surface of the ground. For each specific soil type and surface condition there is a minimum velocity required to move soil particles. This is called the threshold velocity. Once this velocity is reached, the quantity of soil moved is dependent upon particle size, the cloddiness of particles, and wind velocity itself.

Suspension – Suspension occurs when very fine dirt and dust particles are lifted into the wind. They can be thrown into the air through impact with other particles or by the wind itself. Once in the atmosphere, these particles can be carried very high and be transported over extremely long distances. Soil moved by suspension is the most spectacular and easiest to recognize of the three forms of movement.

Saltation – The major fraction of soil moved by wind is through the process of saltation. In saltation, fine soil particles, are lifted into the air by the wind and drift horizontally across the surface, increasing in velocity as they go. Soil particles moved in the process of saltation cause severe damage to the soil surface and vegetation. They travel approximately four times longer in

distance than in height. When they strike the surface again, they either rebound back into the air or knock other particles into the air.

Surface Creep – The large particles which are too heavy to be lifted into the air are moved through a process called surface creep. In this process, the particles are rolled across the surface after coming into contact with the soil particles in saltation.



2.1.2 Erosion Factors

The four principal factors in soil erosion are climate, soil characteristics, topography and ground cover. These factors are interrelated in their effect on erosion potential. The variability in Oregon's terrain, soils, and vegetation makes erosion control unique to each construction site. Understanding the factors that affect the erosion process enables us to make useful predictions about the extent and consequences of on-site erosion.

An empirical model developed for agriculture applications, the Revised Universal Soil Loss Equation (RUSLE) predicts soil loss resulting from sheet and rill erosion. It considers both the effects of erosion control practices and the factors that influence erosion, so it is useful for evaluating erosion problems and potential solutions.

2.1.2.1 Climate

Climate affects erosion potential both directly and indirectly. In the direct relationship, rain is the driving force of erosion. Raindrops dislodge soil particles, and runoff carries the particles away. The erosive power of rain is determined by rainfall intensity (millimeters of rain per hour) and droplet size. A highly intense rainfall of relatively short duration can produce far more erosion than a long duration storm of low intensity. In addition, storms with large raindrops are much more erosive than misty rain events with small droplets. Oregon has considerable diversity of climate. Rainfall intensity, duration, and droplet size vary according to geographic location.

2.1.2.2 Soil

Soil is a product of its environment. A soil's erodibility, or the vulnerability of soil to erosion, is a result of a number of soil characteristics which can be divided into two groups: those influencing infiltration, or the movement of water into the ground, and those affecting the resistance to detachment and transported by rainfall and runoff. Key factors that affect erodibility are soil texture, amount of organic matter, soil structure, and soil permeability.

- Soil texture refers to the sizes and proportions of the particles making up a particular soil. Sand, silt, and clay are the three major classes of soil particles. Soils high in sand content are said to be coarse-textured. Because water readily infiltrates sandy soils, the runoff, and consequently the erosion potential, is relatively low. Soils high in content of silts and clays are said to be fine-textured or heavy. Clay, because of its stickiness, binds soil particles together and makes a soil resistant to erosion. However, once heavy rain or fast flowing water erodes the fine particles, they will travel great distances before settling.

- Organic matter consists of plant and animal litter in various stages of decomposition. Organic matter improves soil structure and increases permeability, water holding capacity, and soil fertility. Organic matter in an undisturbed soil or in mulch covering a disturbed soil reduces runoff and erosion potential. Mulch on the surface also cushions the soil from erosive impact of raindrops.

- Soil structure is the arrangement of soil particles into aggregates. Soil structure affects the soil's ability to absorb water. When the soil is compacted or crusted, water tends to run off rather than infiltrate. Erosion hazard increases with increased runoff. A granular structure is the most desirable one. Loose granular soils absorb and retain water, which reduces runoff and encourages plant growth.

- Soil permeability refers to the ability of the soil to allow air and water movement through the soil. Soil texture, structure, and organic matter all contribute to permeability. Soils that are least subject to erosion from rainfall and shallow surface runoff are those with high permeability rates, such as well-graded gravels and gravel-sand mixtures. Loose, granular soils reduce runoff by absorbing water and by providing a favorable environment for plant growth.

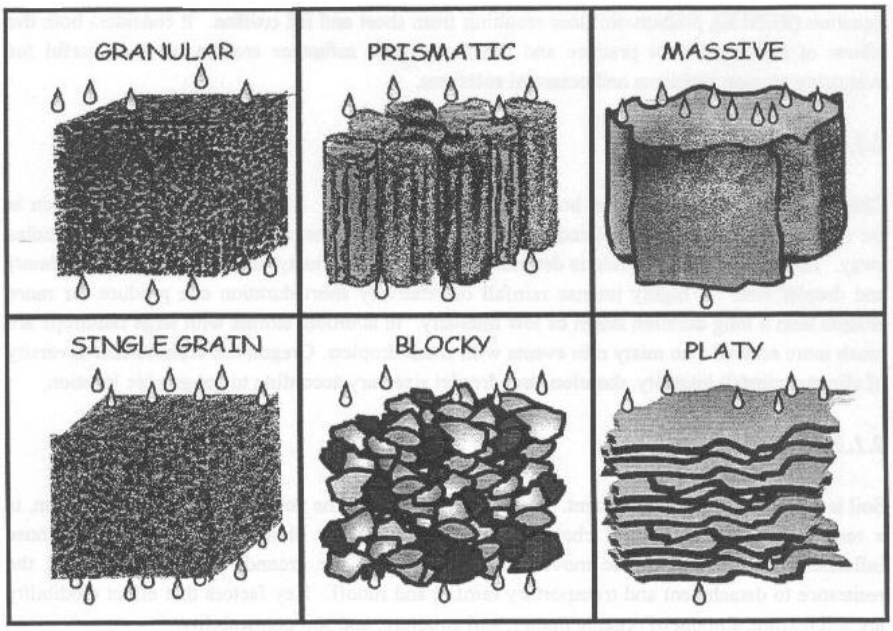


Figure 2-3 Soil Structure

2.1.2.3 Topography

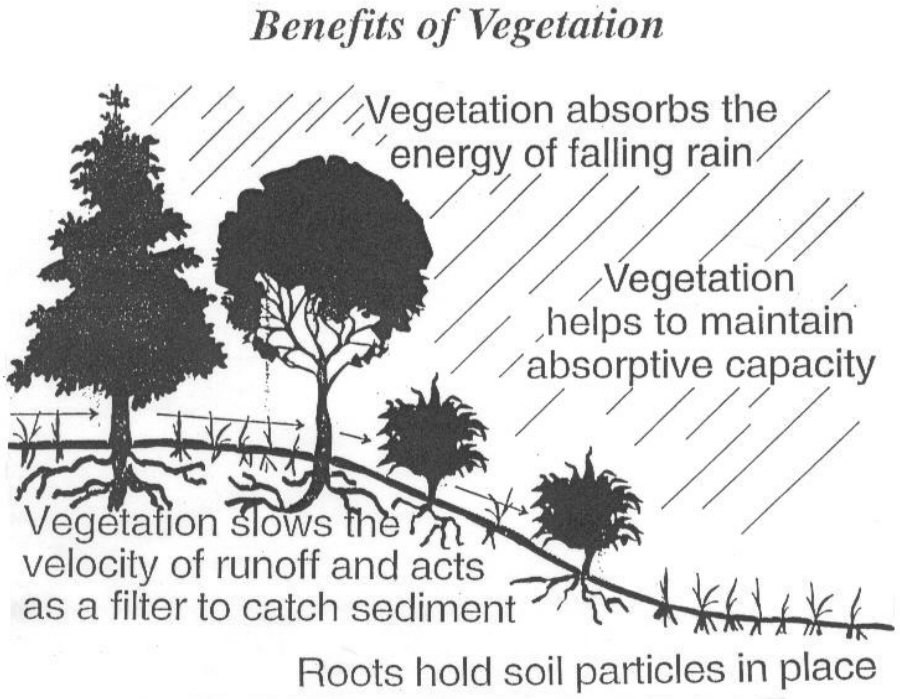
Topographic features distinctly influence erosion potential. Watershed size and shape, for example, affect runoff rates and volumes. Long, steep slopes increase runoff flow velocity. Swales and channels concentrate surface flow, which results in higher velocities. Slope length and slope steepness are critical factors in erosion potential, since they determine in large part the velocity of runoff. Long, continuous slopes allow runoff to build up momentum. The high velocity runoff tends to concentrate in narrow channels and produce rills and gullies.

The shape of a slope also has a major bearing on erosion potential. The base of a slope is more susceptible to erosion than the top, because runoff has more momentum and is more concentrated as it approaches the base. Slope orientation can also be a factor in determining erosion potential. In northern latitudes, exposed south-facing soils are hotter and drier, which makes vegetation difficult to establish. Northern exposures tend to be cooler and moister, receiving less sunlight, which results in slow plant growth.

2.1.2.4 Ground Cover

The term ground cover refers principally to vegetation, but it also includes surface treatments such as mulches, matting, wood chips, and crushed rock. Vegetation is the most effective means of stabilizing soils and controlling erosion. It shields the surface from the impact of falling rain, reduces flow velocity, and disperses flow. Vegetation provides a rough surface that slows the runoff velocity and promotes infiltration and deposition of sediment. Plants remove water from the soil and thus increase the soil's capacity to absorb water. Plant leaves and stems protect the

soil surface from the impact of raindrops, and the roots help maintain the soil structure while holding the soil in place.



2.2 Impacts of Erosion and Sedimentation

Erosion and sedimentation cause both environmental and economic impacts. Both are important, but are often only an economic impact that spurs a jurisdiction to take action. Environmental impacts are harder to see and quantify as they tend to build slowly and do not produce dramatic results for many years, when it may be too late to correct the problem. Erosion and sedimentation can cause expensive site damage and construction delays. Lack of maintenance often results in failure of control practices and costly cleanup and repairs.

2.2.1 Environmental Impacts

Many environmental impacts from sediment pollution are cumulative and the ultimate results and costs may not be evident until years later.

- Eroded soil contains nitrogen, phosphorus, and other nutrients. When carried into water bodies, these nutrients trigger algal blooms that reduce water clarity, deplete oxygen, lead to fish kills, and create odors.
- Erosion of streambanks and adjacent areas destroys streamside vegetation that provides aquatic and wildlife habitats.
- Excessive deposition of sediments in streams smothers the bottom fauna, seals stream beds, and destroys fish spawning habitat.
- Turbidity from sediment reduces in-stream photosynthesis, which leads to reduced food supply and habitat.
- Turbidity increases the amount of sunlight absorbed in water, raising stream temperatures.

- Suspended sediment abrades and coats aquatic organisms.
- Erosion removes the smaller and less dense constituents of topsoil - those clays, fine silt particles and organic materials that hold nutrients that plants require for healthy establishment. The remaining subsoil is often hard, rocky, infertile, and droughty; thus making reestablishment of vegetation difficult.

2.2.2 Economic Impacts

Many economic impacts are hard to quantify. How can a dollar value be assigned to loss of aquatic habitat or diminished water clarity? Other impacts may be readily quantified, for example the cost of dredging and disposing of the accumulated sediment in a silted-up reservoir.

- Excessive sediment accumulation reduces reservoir storage capacity and more frequent sediment removal is required.
- The cost of building new reservoirs to replace lost reservoir capacity is high. Increasing land values and lack of available sites are making this alternative much less feasible.
- Sediment deposited into streams reduces flow capacity, interferes with navigation, and increases the risks of flooding. Regular maintenance dredging is required.
- Erosion severely diminishes the ability of the soil to support plant growth. To restore this ability is costly.
- Listing additional wildlife as endangered species increases time and fees for permitting, design, and construction in the affected watersheds. Some costs are directly assessed to specific projects while many other costs are distributed statewide by spending additional monies for habitat restoration.

2.2.3 Pollutants

This section covers potential impacts on natural systems associated with pollutants from construction activities, and provides an overview of important pollutant categories and some of their effects on the environment.

Pollutants, as the term applies to our subject, are substances that can render water harmful to people, fish, or wildlife, or impair recreation or other beneficial uses. Sediments, nutrients, bacteria, oxygen-demanding materials, heavy metals, petroleum hydrocarbons, and synthetic organic chemicals are the most important classes of pollutants. Heavy metals, petroleum-hydrocarbons and synthetic organics are frequently classified as toxic pollutants, depending on their characteristics.

2.2.3.1 Sediment

Sediments and other suspended solids are the most common pollutant in storm water runoff. Erosion and sediment loss from a site occur most commonly because of vegetation removal. Soils exposed during construction, mining, logging or agriculture can contribute substantial quantities of sediment to nearby water bodies. Construction site erosion is one of the primary contributors.

Suspended particles, or turbidity, turn water cloudy, degrading aquatic habitats and can increase the cost of maintaining storm drainage facilities. Deposited sediments can affect adjacent properties and clog catch basins and storm drains, causing flooding and higher maintenance

costs. When sediments enter streams and lakes, they create cloudy or turbid water conditions. This condition interferes with recreational use and enjoyment, and affects fish and other aquatic life habitats. For example, sediments can make it difficult for fish to feed and breathe, cover gravels needed by salmon and trout for spawning and rearing, and smother fish eggs and aquatic insects on which fish feed. In addition, sediments can transport many other pollutants, including nutrients, bacteria, metals and some organic pollutants.

2.2.3.2 Nutrients

Plants require nutrients such as phosphorus and nitrogen for growth, but excessive levels in receiving waters can harm water quality. Excess nutrient levels over-stimulate the growth of algae and other aquatic plants, potentially causing unpleasant tastes, odors, unsightly conditions and lowered dissolved oxygen levels form plant decay. Nutrients tend to be more of a problem in slow moving water such as lakes or sluggish streams. Sources of nutrients include organic and inorganic fertilizers, soils and decomposing vegetation.

2.2.3.3 Bacteria

The presence of disease-bearing organisms in surface waters, such as bacteria and viruses, potentially threatens public health. Fecal coliform bacteria are often used as an indicator for such pathogens, even though generally they are not pathogenic themselves. The presence of fecal coliforms, however, indicates that warm-blooded animal waste is present. The most common impacts associated with fecal coliform pollution are closed (decertified) shellfish growing areas and reduced recreational opportunity. Potential construction site sources of fecal coliforms include outhouses that are not maintained or pumped out on a regular basis. The clearing and grading process can also expose waste, deposited prior to construction, to runoff.

Bacterial decomposition of plant, animal and chemical wastes requires oxygen. When this process occurs in water, it reduces the oxygen available for fish and other aquatic organisms. If dissolved oxygen levels become too low, fish and other aquatic organisms may become stressed or die.

Construction sites can be a source of oxygen-demanding substances. For example, cleared vegetation, exposed soils, spilled chemicals, and animal or human wastes can all contribute to lower oxygen levels in water.

2.2.3.4 Heavy Metals

Many metals are toxic and are regulated by the Environmental Protection Agency (EPA). Specifically, EPA classifies eight metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) as hazardous and regulates their disposal.
Metals such as copper and zinc, which partially dissolve in water, may create toxic conditions for fish and other aquatic life. A large fraction of the metals in construction site runoff is attached to sediments and other particles. Sediments carrying heavy metals often settle out from water and accumulate on stream and lake bottoms where they can remain for a long time. The metals accumulate in the tissue of organisms, which are then eaten by predators near the top of food chains. High concentrations of heavy metals can sometimes be found in these predators.

Construction materials or equipment that contain such metals include paints, preservatives, metal downspouts, brake linings and tires. Other metal sources are wastes such as used automotive liquids, fuels, dust from sanding or grinding metal and painted surfaces, and wash from roadways.

2.2.3.5 Petroleum Hydrocarbons

Petroleum hydrocarbons include crude oil and any products derived from it in the refining process, such as gasoline, diesel fuel, industrial and home heating fuels, and lubricating oils.

Petroleum products can be present in a number of forms on a construction site, principally as vehicle fuels, cleaning solvents, and lubricants. If released to the environment, they can harm water quality in various ways. Certain petroleum products contaminate water supplies. They are acutely toxic and kill fish and invertebrate life. Petroleum products also consume oxygen as they decay naturally and greatly reduce the aesthetic quantities of water bodies for human enjoyment. As of result of these potentially severe impacts, petroleum products require special care during storage, transfer, and usage on construction sites.

2.2.3.6 Synthetic Organics

Synthetic organics contain carbon and are any type of chemical produced through industrial or combustion processes. Synthetic organic substances include most pesticides, preservatives, solvents, and plasticizers, as well as incidental and unwanted by-products of fuel combustion. Many organics, depending on their composition and rate of degradation, are slow to degrade and remain in the environment for long periods of time. Synthetic organics can be quite toxic to fish and other aquatic life and are sometimes classified as carcinogenic (cancer causing).

Organics include common pesticides and the ingredients of many common household and industrial chemicals. Pesticides, by their very purpose, are designed to kill and can do the same in receiving waters.

Organics can be liquid or solid products, or waste materials. Liquid and solid products may enter the environment when they leak or are spilled from containers during use or transfer, are carried away by rain water and wash water, or are spilled or dumped on the ground or down the storm drain. Therefore, they also warrant a special consideration for careful inspection at construction sites.

TABLE 2-1 OVERVIEW OF POLLUTANT SOURCES, IMPACTS, AND INDICATORS

POLLUTANTS	MAJOR SOURCES	IMPACTS	INDICATORS
Sediments and other solids	Clearing/grading exposed soils	Cloudy water, smothering of fish eggs and insects, flooding	Total suspended solids, turbidity
Nutrients	Cleared vegetation exposed soils human/animal waste	Algal blooms, reduced oxygen, aquatic plant growth	Different forms of phosphorus and nitrogen
Bacteria	Human/animal wastes, sewer lines, septic tanks	Shellfish contamination, human health effects	Fecal coliforms
Oxygen demanding materials	Cleared vegetation, human/animal waste, chemical reactions	Reduced oxygen in water, stress/kill salmonid fish and other aquatic life	Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), dissolved oxygen
Heavy metals	Paints, flashings, downspouts, tires, preservatives, solvents	Bioaccumulation in food chain, toxic to aquatic life, human health effects	Ar, Cd, Cu, Hg, Ni, Pb, Zn
Petroleum hydrocarbons	Oil, grease, fuels, lubricants	Decreased oxygen levels, aesthetics, human, aquatic and wildlife health effects	Oil & grease, total petroleum hydrocarbons
Synthetic organics	Pesticides, pcb's, combustion products, solvents	Bioaccumulation in food chain, toxic to aquatic life, wildlife and humans	Variety of organics analyses

2.3 Principles of Erosion and Sedimentation

Effective erosion and sedimentation control requires first that the soil surface is protected from the erosive forces of wind, rain, and runoff, and second that eroded soil is captured on-site. Erosion control is the prevention or minimization of soil erosion. Sediment control is the trapping of suspended soil particles. Erosion control is the preferred approach. Sediment control is necessary because some erosion is unavoidable. The following principles are not complex but are effective. They should be integrated into a system of control measures and management techniques to control erosion and prevent off-site sedimentation.

Fit site construction to the terrain. Review and consider all existing conditions in the initial site selection for the project. When construction is tailored to the natural contours of the land, little grading is necessary and erosion potential is consequently reduced.

Time grading and construction to minimize soil exposure. Scheduling can be a very effective means of reducing the hazards of erosion. Stage construction activities to minimize the exposed area and the duration of exposure. In scheduling, take into account the season and the weather forecast. Time grading to coincide with a dry season or a period of lower erosion potential. Stabilize disturbed areas as quickly as possible.

Retain existing vegetation whenever feasible. Vegetation is the most effective form of erosion control. Very little erosion occurs on a soil covered with undisturbed natural vegetation. Reestablishing vegetation can be a difficult and costly process. If possible, strip only the area where construction will actually occur, street and driveway lines, and cut and fill slopes. Try to integrate existing trees and other natural vegetation into the site improvement plan.

Vegetate and mulch denuded areas. Seed and mulch denuded soils as soon as possible after grading is completed. Mulch helps seedlings to become established and protects the soil from raindrop splash until vegetation takes over. Soils may be planted with temporary or permanent vegetation. If the soil will be exposed during the winter months, protective measures other than vegetation must be used.

Divert runoff away from denuded areas. When vegetative cover is removed from land, the soil becomes highly susceptible to erosion. Runoff from areas that have been denuded should not be allowed to cross the exposed soils, particularly when the denuded areas are on slopes. Use diversion dikes or swales to divert upland runoff away from a disturbed area to a stable outlet.

Minimize length and steepness of slopes. Slope length and steepness are among the most critical factors in determining erosion potential. Increasing slope length and steepness increases the velocity of runoff, which greatly increases its erosive energy. If slope steepness is doubled while other factors are held constant, soil loss potential is increased 2-1/2 times. If both slope steepness and length are doubled, soil loss potential is nearly 4 times greater. To prevent erosive velocities from occurring on long, steep slopes, interrupt the slopes at regular intervals using barrier or trap techniques.

Keep runoff velocities low. The energy of flowing water increases as the square of the velocity, that is, the velocity doubles, the erosive energy quadruples and the water can theoretically move particles 64 times larger by volume.

Channel velocities can be kept low by lining drainage ways with rough surfaces such as vegetation and riprap, by designing broad, shallow flow areas, and by constructing check dams at frequent intervals. Concrete channels, although efficient and easy to maintain, remove runoff quickly, often resulting in downstream channel erosion and flooding.

Prepare drainage ways and outlets to handle concentrated or increased runoff. Construction changes the characteristics of runoff. The creation of impervious surfaces, removal of plant cover, and compaction of soil by construction traffic allows less water to percolate into the soil and therefore increases the volume of runoff. Alternatively, if a project can be so designed that

runoff from development areas is allowed to infiltrate into the soil on-site, no off-site channel enlargement or protection should be necessary. To prevent channel erosion from occurring, design drainage ways to withstand the peak flows without erosion, select lining materials appropriate for peak flows, and deenergize concentrated flows at outlets using energy dissipaters.

If development substantially changes the natural drainage conditions in a watershed, merely protecting the drainage channels on a project site may not be sufficient to prevent erosion. *Trap sediment on site.* Some erosion during construction is unavoidable. The function of a sediment barrier is to prevent sediment from leaving a site after the soil has been eroded from its place of origin. Sediment laden runoff should be detained on-site so that the soil particles can settle out before the runoff enters receiving waters. Locate sediment basins and traps at low points below disturbed areas. Use earth dikes or swales to route drainage from disturbed areas into the basins. Sediment barriers and sediment fences can be placed below small disturbed areas on gentle to moderate slopes. Storm water temporarily ponds up behind these barriers, allowing sediment to settle out.

Inspect and maintain control measures. Inspection and maintenance of control measures are vital to the success of an erosion and sediment control program. Most control measures require regular maintenance. Problems often develop during a single storm. Some problems left untreated can result in more erosion damage than might have occurred without any erosion control measures. Inspect control measures frequently, particularly before, during, and after storm events, to ensure that they are working properly. Correct problems as soon as they develop. Assign to an individual the responsibility for routine inspections of operating erosion and sedimentation control practices.

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CHAPTER 3
EROSION CONTROL PLANNING

The purpose of erosion and sediment control planning is to clearly establish the control measures which are intended to prevent erosion and off-site sedimentation during construction. The Erosion and Sediment Control Plan (ESCP) serves as a blueprint for the location, installation, and maintenance of practices to control erosion and prevent sediment from leaving the site during construction. It should also be understood that plans are only a blueprint and will require modification throughout the life of the project.

3.1 Prevention vs. Sediment Control

The driving consideration in creating and implementing an effective ESCP to provide erosion prevention measures rather than sediment control. Although every ESCP will have elements of both, it is often far more cost effective and practical to emphasize erosion prevention. Erosion prevention measures are designed to prevent exposed soil particles from becoming dislodged by rain or wind. Such measures include temporary ground covers (mulch, temporary grasses, straw mulch and tackifier, etc.), matting, plastic sheeting, and numerous other products designed to provide mechanical or physical protection to exposed soil. Sediment control involves techniques to re-capture transported sediment from runoff. Sediment control measures include sediment traps and basins, sediment fences, check dams, sediment barriers, catch basin filters, etc.

The benefit of erosion prevention is that it seeks to prevent the problem before it starts. It is also often impractical to recover large amounts of sediment after it becomes dislodged and suspended in runoff. On projects where the predominant soil particle size is very small (fine silts and clays), the amount of time required to allow for settling of solids can reach days or even weeks. It is also generally true that erosion prevention measures are more reliable, whereas sediment control measures require continual and costly maintenance. Because successful erosion control requires minimizing disturbed areas, the ESCP should emphasize scheduling and phasing. Project scheduling and phasing is often driven by factors other than erosion control, however, so contingency planning is essential. Most importantly, the ESCP should be designed and implemented as a living, dynamic plan that can be adapted to address changes in the project as work progresses.

3.2 Five Basic Rules of Planning

Erosion control measures are required for construction areas where the ground surface will be disturbed by clearing, grading, fills, excavations and other construction activities. When developing an effective ESCP, there are several important concepts to consider:

- Timing - schedule work to minimize overall impacts
- Stage work - identify & process critical areas first
- Minimize disturbance - create buffers & reduce mass grading
- Pre-construction - during preliminary design & prior to on site grading activities
- Pictures/Video - documentation throughout life of project

The long-term benefits of an effective erosion and sediment control plan are enormous. There is less chance of soil washing of the site and clogging streets, drainage systems, and entering adjacent properties. The number and size of erosion control measures required will be minimized. The cost of maintaining erosion control facilities is minimized. The top soil is retained on the site, making re-vegetation and landscaping easier to establish.

It is equally important to note that approval of an erosion and sediment control plan by the local jurisdiction does not relieve the applicant's responsibility to ensure that erosion control measures are constructed and maintained to prevent sediment from leaving construction site. These requirements are upheld throughout the life of the construction site.

3.3 Designer Responsibilities & Designated Persons

A designer puts the ESCP together in the office based upon information provided from resources obtained from local and regional agencies, and a detailed field site visit. In addition, the designer must, identify potential erosion and sediment problems, develop design objectives, formulate and evaluate alternatives, select best erosion prevention measures, and develop a plan. A determination is made about what best management practices are appropriate. A variety of BMP's should be included on the plan in order to provide adequate tools in the field. By following the step by step process listed below, designers can improve overall success.

The designated person, whether contractor or erosion and sediment control specialist, has a defined responsibility to prevent pollution from leaving the site. The person must follow a plan, or obtain approval to a revised plan, and insure that the site is stable. Even though the ESCP may be followed in detail and appear to have addressed all issues, there will inevitably be obstacles along the way that will change those plans. Therefore, the best scenario includes a good plan, open lines of communication, and defined responsibilities.

For 1200-C permits, the designated person is responsible for monitoring and record keeping of the site conditions as they relate to erosion prevention and sediment control. In addition to having appropriate training and experience, the DEQ 1200-C Guidance specifies that the designated person:

- is knowledgeable in the principles and practice of erosion and sediment controls,
- possesses the skills to assess conditions at the construction site that could impact stormwater quality,
- is knowledgeable in the correct installation of the erosion and sediment controls, and
- is able to assess the effectiveness of any sediment and erosion control measures selected to control the quality of stormwater discharges from the construction activity

3.3.1 Soil Survey Information

Knowing the type of soil found on the project site will help the designer decide upon the degree of erosion protection required. This will ensure that the ESCP is adequate to control soil movement without being overly conservative. Each county has a published survey of soils and that information is found in the Natural Resource Conservation Service Soil Survey, a mapped inventory by county with physical properties and characteristics described for each soil type.

Of prime importance are the predictions of soil behavior for selected land uses. Great differences in soil properties can occur even within short distances. Soils may be seasonally wet or subject to flooding. They may be shallow to bedrock. A directory of NRCS county offices can be found on the Internet at http://www.or.nrcs.usda.gov/contact/countydir.html

3.3.2 Climate and Precipitation Data

The occurrence and amounts of rainfall is important for the designer when deciding to what extent the erosion control measures must be used. Rain gauges can be used to assist in determining on-site rainfall. Precipitation data may be found by contacting the National Weather Service.

West Coast Weather Observation at www.ocs.orst.edu/ gives information on temperatures, wind direction, relative humidity, and precipitation all over Oregon. Oregon Coast and Pacific Northwest Weather Forecasts provides weather predictions as well as current weather data and can be reached at http://IWIN.nws.noaa.gov/iwin/or/or.html

3.3.3 Topography

From the site visit, determine the drainage patterns from the topography. Does runoff flow from offsite through the construction site? If so, measures should be taken to re-route this water around areas that will have ground disturbance.

Will areas of soil disturbance occur on long or steep slopes? If so, the lengths of the uninterrupted flows should be broken up so that the rainfall runoff will only flow short distances thereby decreasing flow velocity and the erosive force. In flat areas, runoff is slow and soil particles are not moved far from the point of raindrop impact. If the slopes are steep and short, surface cover may be needed to decrease runoff and promote rainfall infiltration into the soil. On steep slopes, soil movement increases dramatically. Constructing very long slopes and especially, long, steep slopes should be avoided. Those that already exist should not be disturbed.

3.3.4 Revised Universal Soil Loss Equation (RUSLE)

In order to properly design retention and conveyance structures, a designer must be able to calculate the quantities of water and sediment that will be managed by the structure. The design method for calculating soil loss from disturbed land is the Revised Universal Soil Loss Equation (RUSLE). RUSLE estimates soil loss from a slope caused by raindrop impact and overland flow (collectively referred to as “interrill” erosion), plus rill erosion. It does not estimate gully or stream-channel erosion. RUSLE is a tool to estimate the rate of soil loss based on site-specific environmental conditions and a guide for the selection and design of sediment and erosion control systems for the site. RUSLE does not determine when soil loss is excessive at a site, when erosion control systems have failed, or sediment yield once it has left the site. The RUSLE user makes such decisions based upon numerous criteria, of which soil-loss and sediment-yield estimates are on important compound.

For a complete copy of the guidelines and the public domain RUSLE software, please contact:

http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm or

The Office of Technology Transfer
http://www.ott.wrcc.osmre.gov/elearning/rusle106b.htm

3.4 Project Scheduling

Following a specified work schedule that coordinates the timing and land disturbing activities and the installation of control measures is perhaps the most cost-effective way of controlling erosion during construction. The removal of ground cover leaves a site vulnerable to accelerated erosion. Construction procedures that limit land clearing, provide the timely installation of erosion control and sedimentation controls, and restore protective cover quickly can significantly reduce the erosion potential of a site.

Construction projects should be sequenced to reduce the amount and duration of soil exposure to erosion by wind, rain, runoff, and vehicle tracking. The construction schedule is an orderly listing of all major land disturbing activities together with the necessary erosion and sedimentation control measures planned for a project. This type of schedule guides the contractor on work sequencing so that serious erosion and sedimentation problems can be avoided.

The ESCP should indicate in each of the scheduled work, how the proposed erosion/sediment control measures will divert flows, limit runoff from exposed areas, stabilize exposed soil and filter sediment. The following activities should be included in the schedule, if applicable.

- Obtain approval of EPSC plan and permits
- Clearing and grubbing for perimeter controls only
- Installation of perimeter controls
- Inspection and approval of measures per plan
- Construction phasing
- Clearing and grubbing, grading and trenching for activities other than perimeter control.
- Grading (including off-site activities) related to the project.
- Final grading, landscaping, and stabilization.
- Work on or at bridges and other water course structures.
- Utility installation and removal.
- Work required in any wetland.
- Monitoring and recording of rainfall.
- Inspection of controls.
- Installation and maintenance of permanent controls.
- Long-term establishment of permanent soil stabilization
- Disposal of waste materials generated on-site
- Installation, maintenance and removal of temporary controls.
- Inspection Log

Note that the construction activities listed above do not usually occur in a specified linear sequence, and schedules will vary due to weather and other unpredictable factors.

Schedules for temporary and permanent erosion control work required in any wetlands, as are applicable for clearing and grubbing, grading, trenching, bridges, and other structures at water courses, construction, and paving should be submitted for review by the Agency. Plans for erosion control on haul roads and borrow pits and plans for disposal of waste materials should also be submitted. The contractor may submit the ESCP from the project plans if it is correct for the proposed stage of construction, or prepare a modified version, proposing methods, materials, and procedures, to be used for the weather and site conditions at the time of construction, if applicable.

3.5 Developing an Erosion and Sediment Control Plan

Following are recommended steps and check lists to use in the development and implementation of an acceptable Erosion and Sediment Control plan. This information will provide the necessary tools to gain jurisdictional approval and reduce overall environmental risks. Once the project site has been assessed, the catch points for cuts and fills, drainage areas and drainage patterns, sensitive areas, size and location of drainage structures, and of disturbance should be located on the base map. Approximate final grades and any known problems such as highly erodible soils or unstable slopes should also be noted. A sample ESCP and details can be found in Appendix A.

Step 1: Identify Potential Issues

- Public opinion
- Environmental interest groups
- Public Agencies
- Federal and State Environmental Regulations

Step 2: Goals and Objectives

- Meet all regulations
- Minimize negative public opinion
- Improve aesthetics
- Enhance the environment
- Decrease liability
- Higher emphasis on stabilizing steep slopes (2:1 or greater)
- Reduce short and long term erosion
- Reduce or eliminate irrigation costs
- Maximize use of on-site materials (cost-effective solutions)
- Reduce overall maintenance

Step 3: Erosion Study

- Sediment sources
- Review relative sources
    - Maps and aerial photos
    - Distinctive minerals
    - Alluvial fans

- Review regional factors
  - Temperature
  - Precipitation
  - Wind
  - Freeze/thaw
  - Snow melt
- Review watershed
  - Watershed size
  - Topography
  - Channel density
  - Soil types
  - Ground cover
  - Land use

Step 4: Selection of Erosion and Sediment Control Materials

- Effectiveness
- Environmental impacts
- Regulatory acceptability
- Material Cost
- Long-term cost (maintenance)
- Public acceptability
- Risk/liability
- Aesthetics

Step 5: Developing the ESCP (where to go?)

- Local planning and zoning department
  - Regulations and ordinances
  - Prior land use
  - Adjacent and downstream uses
- NRCS/District Conservationist
  - Soils
  - Climate
  - Vegetation/habitat
  - Water management
  - Recreational potential
  - Aerial surveys
- U.S. Geological Survey
  - Topographical maps
  - Major drainage ways
- State Environmental Agencies
  - Stream surveys
  - Wildlife habitat
  - ESA
  - Wetlands
  - Sensitive areas

- Local Flood Control
  - Rainfall data
  - Storm records
  - Flood plains

Step 6: Developing the ESCP (collecting data)

- Photo/video documentation
- Field survey and evaluation (existing)
  - Topography & contours
  - Existing drainage upstream & downstream
  - Identify sensitive areas
  - Soil samples
  - Soil survey (NRSC)
- Field survey and evaluation (future)
  - Topography & contour design
  - Site drainage system type & location
  - Impervious areas
- Climate and rainfall information
  - Onsite rain gauges
  - Meteorologists
  - Airport
- Critical habitat
  - Wetlands vegetation profile
  - Mitigation/enhancement
- Revised Universal Soil Loss Equation (RUSLE)
  - A = R x K x LS x C x P
  - A = Average annual rate of erosion in tons/ac/yr
  - R = Rainfall factor
  - K = Soil erodibility factor
  - L = Slope length
  - S = Slope gradient
  - C = Cover
  - P = Conservation practice

Step 7: Lay out Pre-construction Plan & Base Measures

- Adapt the plan to the resources available
- Fit the development to the existing terrain whenever possible
- Plan must be flexible
- Keep communication lines open at all times
- All reports and instructions must be clear
- Determine construction timing and sequence
- Establish primary access point (s) for construction traffic
- Lay out limits of clearing & construction activities
- Restrict all activities in sensitive areas (mark accordingly)

- Establish base measures including sediment control at toe of disturbed area & stabilized construction entrances

- Establish maintenance procedures for EC Measures

Step 8: Identify Measures During Construction

- Install additional base measures as site clearing/disturbances occur, including stockpiles & slope contours
- Determine if construction may occur during wet weather season (October 1st – May 31st)
- Establish & schedule wet weather measures including cover measures over exposed soils
- Continue to establish maintenance procedures for EC measures

Step 9: Post Construction Measures

- Establish ground cover or permanent landscaping prior to removing base measures

Step 10: Plans and Specifications ***(Sample ESCP-Appendix A)***

- Project description
- Construction notes
- BMP's standard symbols ***(see appendix A)***
- Names of existing roads, waterways, and drainage features
- Boundaries of environmentally sensitive areas such as wetlands
- Right of way and easements
- Statement of existing conditions to include highly erodible areas (steep slopes)
- Existing and proposed contour lines
- Run-off calculations
- Calculations of desired performance standards
- Description of erosion control treatment areas
- Detailed grass establishment instructions
- Detail for each BMP used
- Wind erosion control during/following construction

Step 11: Operations and Maintenance

- Guidelines
- Maintenance instructions
  - Provide operating procedures during/after storm events
- Standards of performance
- Periodic inspection reports w/supported pictures
- Vegetation criteria
- Monitoring
  - Establish procedures for monitoring performance
  - Provide adjustment to mitigation measures as needed
- Monitoring and maintenance plan
- Maps
  - Project boundaries
  - Adjacent areas
  - Existing and final topographic features

- Drainage areas
- Location of existing problems
- Location of potential problems
- Location and extent of BMP's

3.6 Internet Access Sites

- Oregon Seed Certification Service www.oscs.orst.edu
- Natural Resource Conservation Service www.or.nrcs.usda.gov
- International Erosion Control Association www.ieca.org
- Pacific Northwest Chapter IECA www.pnwieca.org
- West Coast Weather Observations www.ocs.orst.edu/
- Oregon Coast and Pacific NW Weather http://IWIN.nws.noaa.gov/iwin/or/or.html
- US Army Corps of Engineers (COE) http://www.usace.army.mil/
- Dept. Of State Lands (DSL) http://www.oregon.gov/DSL/
- OR Dept Of Fish &Wildlife (ODFW) http://www.dfw.state.or.us/
- DEQ http://www.deq.state.or.us/wq/stormwater/
- OR Dept. of Agriculture (ODA) http://oregon.gov/ODA/
- In addition, remember to always check the website of the local jurisdiction that your project will be in to ensure that you have the most current information on their erosion prevention and sediment control requirements.

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CHAPTER 4
EROSION AND SEDIMENT CONTROL MEASURES AND BMP'S

This chapter presents best management practices for erosion and sediment control. Information such as advantages, disadvantages, design, inspection, and maintenance requirements for each BMP are also included, and should help the designer choose the most appropriate measure or control and to develop special provisions. In order to maximize the overall benefits of any BMP selection and location, planners and designers must have a thorough understanding of the site characteristics. In addition, preconstruction meetings provide a means of opening lines of communications between ALL individuals affected by the construction, either directly or indirectly.

The details of installation can and should vary in the field depending on the site conditions. Field variations for each type of measure are encouraged. The substitution of other cost-effective products or methods that provide substantially equivalent or superior performance is allowed if approved by the Agency.

As implied by their name, BMP's are stabilization methods and structural erosion control measures that represent commonly accepted practices. Table 4-1 represents ratings for basic applications of commonly used erosion and sediment control measures.

Table 4-1 Matrix of temporary and permanent erosion control measures and estimated effectiveness ratings: E=Excellent, M=Moderate, P=Poor

BMP APPLICATION	TEMPORARY VS PERMANENT	RATING	PAGE
EROSION PREVENTION			
Buffer Zone	P	E	4-5
Dust Control	T	M	4-7
Ground Cover	T	E	4-9
Hydraulic Applications	T/P	E	4-13
Matting	T	M	4-17
Plastic Sheeting	T	M	4-25
Preserve Natural Vegetation	P	E	4-29
Seeding Temporary/Permanent	T/P	E	4-33
Sod	P	M	4-40
RUNOFF CONTROL			
Check Dams	T	M	4-43
Diversion Dikes and Swales	T	M	4-49
Grass-lined Swale	T	M	4-53
Outlet Protection	T	E	4-57
Pipe Slope Drain	T	E	4-63
Surface Roughening	T	E	4-69
SEDIMENT CONTROL			
Bio-filter Bags	T	M	4-77
Construction Entrance	T	E	4-81
Dewatering	T	E	4-85
Filter Berm	T	M	4-89
Inlet Protection	T	M	4-95
Oak Mats	T	E	4-107
Pre-Fabricated Barriers	T	M	4-111
Sand Bags	T	M	4-115
Sediment Basin	P	E	4-119
Sediment Fence	T	M	4-125
Sediment Trap	T	E	4-131
Sidewalk Subgrade Gravel Barrier	T	M	4-137
Tire Wash	T	E	4-141
Wattles	T	M	4-145

4.1 Erosion Prevention

Erosion prevention is the most effective and inexpensive method for reducing overall environmental impacts associated with construction activities. With this in mind, Timing, Staging, Minimizing the amount of exposed soil and directing surface water runoff away from exposed soil are all excellent ways to minimize erosion during construction. Erosion control practices primarily involve preserving natural vegetation when possible or stabilizing exposed soils with temporary covers or permanent vegetation. Reducing the erosion associated with construction vehicular traffic is also covered in this section. Many of these techniques can reduce erosion by 80 to 95 percent compared with exposed soils.

1. Buffer Zone
2. Dust Control
3. Ground Cover
4. Hydraulic Applications
5. Matting
6. Plastic Sheeting
7. Preserve Natural Vegetation
8. Seeding - Temporary and Permanent
9. Sod

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BUFFER ZONE



4.1.1 Buffer Zone

A buffer zone consists of an undisturbed area or strip of natural vegetation or an established suitable planting adjacent to a disturbed area that reduces erosion and runoff.

Advantages

- Filters Sediment.
- Promotes infiltration.
- Provides habitat.
- Reduces velocity and quantity of runoff, dissipates energy.
- Provides visual screening.
- Can be used to stabilize stream banks.
- Low maintenance.

Disadvantages

- Requires keeping all construction equipment, debris and soils out of the natural areas.
- Extensive buffers can cover large areas of land that are not available for project development.

Design Criteria

- Preserve natural vegetation in clumps, blocks or strips.
- Preserve natural vegetation on unstable, steep slopes.
- Clearly establish construction limits with orange construction safety fence and signs spaced 100 feet apart.
- Vegetative buffer zones for streams, lakes or other waterways should meet current regulatory standards for wide.

Inspection & Maintenance

- Inspect flagging and fencing frequently and repair as needed.

DUST CONTROL



4.1.2 Dust Control

Preventative measures to minimize the wind transport of soil, prevent traffic hazards and reduce sediment transported by wind and deposited in water resources.

Advantages

- Reduces movement of soil to offsite areas.
- Increases visibility.

Disadvantages

- Over watering may cause erosion.
- Most methods require immediate reapplication if disturbed.
- Too little watering fails to control dust.

Design Criteria

- Installing construction entrances and stabilizing construction haul roads with crushed rock
- Designer can provide project-specific dust control specifications for the contractor to apply. Measures include:
  - Seeding
  - Mulching
  - Matting
  - Water
  - Tackifier
  - Chemical Soil Stabilizers
- Schedule construction operations so that the least amount of project area is disturbed at one time.
- Install temporary or permanent surface stabilization measures immediately after completing land grading.

Inspection & Maintenance

- Maintain dust control measures through dry weather periods until all disturbed areas have been stabilized.
- Immediately re-stabilize areas disturbed by contractor's operations or other activities (wind, water, vandalism, etc.).

GROUND COVER





4.1.3 Ground Cover

Ground Cover is a protective layer of straw or other suitable material applied to the soil surface. Straw mulch and/or hydromulch are also used in conjunction with seeding of critical areas for the establishment of temporary or permanent vegetation. Ground cover provides immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures.

Advantages

- Provides immediate protection.
- Conserves moisture
- Acts as a thermal layer for seed
- If used in conjunction with seed, allows seed growth through the mulch
- Protects seeding from direct heat, moisture loss and transport due to runoff
- Used for dust control

Disadvantages

- Thick mulches can delay germination.
- Can be blown or washed away if not correctly applied.
- Must be removed prior to applying fill material.

Design Criteria

- Divert concentrated runoff from above mulched areas.
- Refer to Table 4-2 outlines mulch type, quality, and application rate.
- The following pages include specific material and application criteria
- Refer to **Appendix C** for *Mulch Application Rate Worksheet*.
- Additional measures may be required to improve effectiveness on slopes.
- On sites where chopped straw mulch is applied, the straw needs to be anchored using a liquid tacking agent.

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Maintain specified thickness of the cover.
- Re-mulch and/or protect with a net or blanket any areas that experience erosion. If the erosion problem is drainage related, fix the drainage problem and re-mulch the eroded area.
- Hydraulically treated areas shall be inspected and monitored after installation and periodically thereafter.
- Hydraulic mulches and tackifiers are interim measures until the permanent erosion-resistant cover is established. If sheet or rill erosion is evident then prompt re-application of treatments and/or additional measures shall be necessary.
- If the hydraulic mulch or tackifiers were applied as stand alone (without vegetation) treatments for erosion and dust control, the product longevity must match the length of time that the soil will remain bare or until revegetation occurs. Periodic inspections will assure the intended purposes will be met.
- Areas that fail to establish cover adequate to prevent erosion shall be re-mulched as soon as such areas are identified.
- If mulched areas are damaged by concentrated runoff, the prompt implementation of additional practices and BMP's may be necessary.

Table: 4-2 Ground Cover Application

Mulch Material	Quality Standards	Application Rate Per acre	Depth of Material	Considerations
Straw	Air dried, free from unwanted seeds & coarse materials	2-2 ½ tons or 90-120 bales	2 inches min. uniform spread	Use where the mulching effects is to be maintained < 3 months. When chopped straw is applied, use a tackifier
Yard Debris Compost	Well composted organic matter free of metals, plastics and other foreign matter	3-6 tons	1 inch 4:1 slopes 2 inch 3:1 slopes 3 inch 2:1 slopes	Excellent soil amendment. Compost size: ¾ x 0 on 3:1 slopes or less. 1 ½ x 0 on 2:1 slopes.
Wood or Cellulose fiber	Dyed green, should not contain growth inhibiting factors	2000 lbs.	N/A	Apply with hydromulcher. May need to double the rate depending on soil and slope. Use tackifier as recommended by manufacturer.
Wood Chips or Grindings	Green or air-dried free of objectionable coarse materials	5-6 tons	1-3 inches depending on slope	Very durable. Apply with mulch blower, excavation equipment, or by hand. Not suitable for areas that require close mowing.
Gravel or Crushed Rock	Washed ¾-1.5 inch	9yds/1000 ft^2	3 inches	Excellent for short slopes and where subject to foot traffic. Larger pit-run can be used on steep slopes prone to sub-surface water (springs)

HYDRAULIC APPLICATIONS



4.1.4 Hydraulic Application

Hydraulic application is a mechanical method of applying erosion control materials to bare soil in order to establish erosion-resistant vegetation on disturbed areas and critical slopes. By using hydraulic equipment, soil amendments, mulch, tackifying agents, Bonded Fiber Matrix (BFM) and liquid co-polymers can be uniformly broadcast, as homogenous slurry, onto the soil. These erosion and dust control materials can often be applied in one operation.

Advantages

- Provides rapid installation with a one step process.
- Generally requires less seedbed preparation, the surface soil may be left irregular with large clods, stones, or rock outcropping exposed.
- Uniformly distributes seed and mulch material.
- Increases favorable conditions for quick germination and growth.
- Can be used effectively on steep slopes and other areas where access is limited.

Disadvantages

- Generally more expensive than broadcast or drilling seed applications.
- Thick mulch applications can delay germination.
- Can be blown or washed away if not adequately tackified.
- Required application rates can vary significantly dependant on site preparation.

Design Criteria

- Divert concentrated runoff from above treated areas.
- Seed, fertilizer, mulch, tackifier, soil amendments, Bonded Fiber Matrix, and chemical stabilization can be applied in a one step procedure.
- Wood fiber mulch or wood/paper mulch should be applied at a rate of 2000 to 2500 lbs per acre.
- Bonded Fiber Matrix (BFM) is considered a liquid blanket and can be applied on steep 1:1 slopes. Application rates between 3000 and 4000 lbs per acre, depending upon soil type and irregularities.
- Use hydraulic applications on slopes steeper than 3:1 that cannot receive adequate seedbed preparation and where mulch would be difficult to otherwise anchor.
- On sites where other soil stabilization, seeding, and mulching practices would result in unacceptable levels of ground disturbance.
- Where site conditions, such as irregular soil surfaces, existing vegetation, and shallow soils preclude the installation of erosion mats.

- When seeding, maintain sufficient moisture level using permanent or temporary irrigation.
- On sites where straw mulch has been applied, the straw needs to be anchored using a liquid tacking agent.
- On sites where dust control is desired.
- If the hydraulic mulch or tackifiers were applied as stand alone (without vegetation) treatments for erosion and dust control, the product longevity must match the length of time that the soil will remain bare or until re-vegetation occurs.
- Refer to **Appendix C** Hydraulic Application Tables for seed and mulch.

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Re-mulch and/or protect with a erosion control mating any areas that experience erosion. If the erosion problem is drainage related, fix the drainage problem then make necessary repairs.
- Hydraulic mulches and tackifiers shall provide the necessary erosion protection until permanent erosion-resistant cover is established. If sheet or rill erosion is evident then prompt re-application of treatments shall be necessary.
- Areas that fail to establish 80% healthy stand of grass cover to prevent erosion shall be properly covered using one of the selected applications.

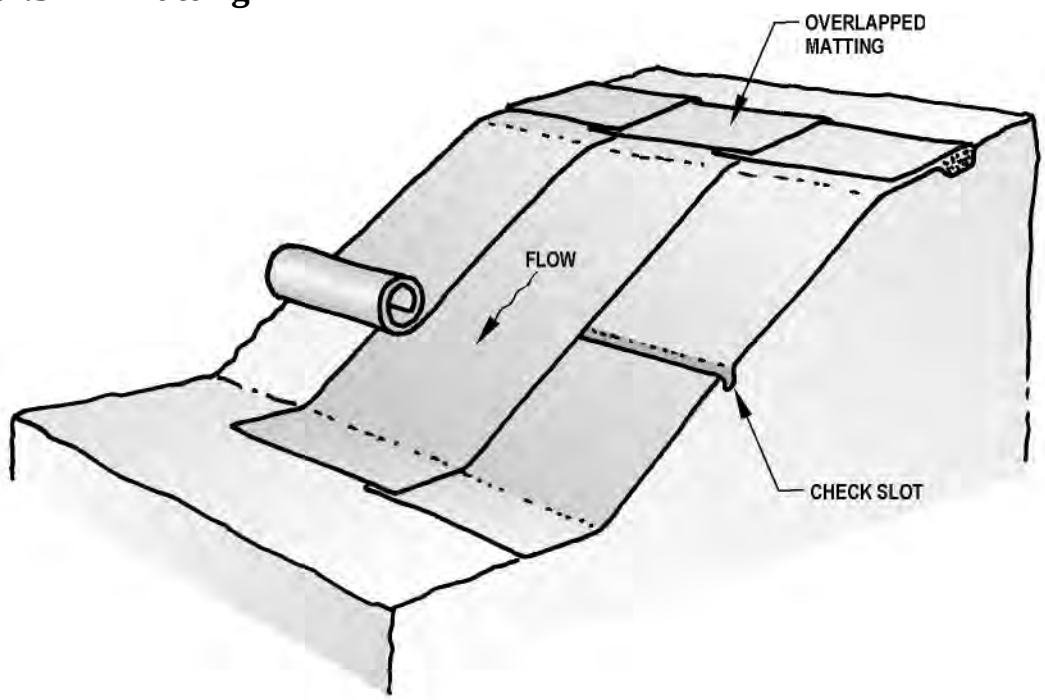
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MATTING





4.1.5 Matting



There are numerous erosion control products available that can be described in various ways, such as matting, blankets, fabric and nets. We will call them all matting. A wide range of materials and combination of materials are used to produce matting including, but not limited to: straw, jute, wood fiber, coir (coconut fiber), plastic netting, and Bonded Fiber Matrix. The selection of matting materials for a site can make a significant difference in the effectiveness of the BMP.

When selecting matting consider these questions:

1. How long will the matting be required to provide protection?
2. How steep is the slope?
3. What is the soil type?
4. What is the shear stress on the channel bottom?

Advantages

- Immediate cushioning against splash erosion from raindrop impact.
- Does not generate high-velocity runoff and, therefore, offers temporary slope protection, which is superior to plastic sheeting.
- Captures a great deal of sediment due to its open, porous structure.
- Usually easy to install.
- Provides long-term protection, based on matting selection.

Disadvantages

- Correct installation is critical to the effectiveness of these products. Good ground contact during installation prevents runoff concentrating under the blanket and causing significant erosion (tenting).
- Soil surface must be graded smooth with no surface irregularities.
- Limited protection capabilities when used as flexible channel liner.

Design Criteria

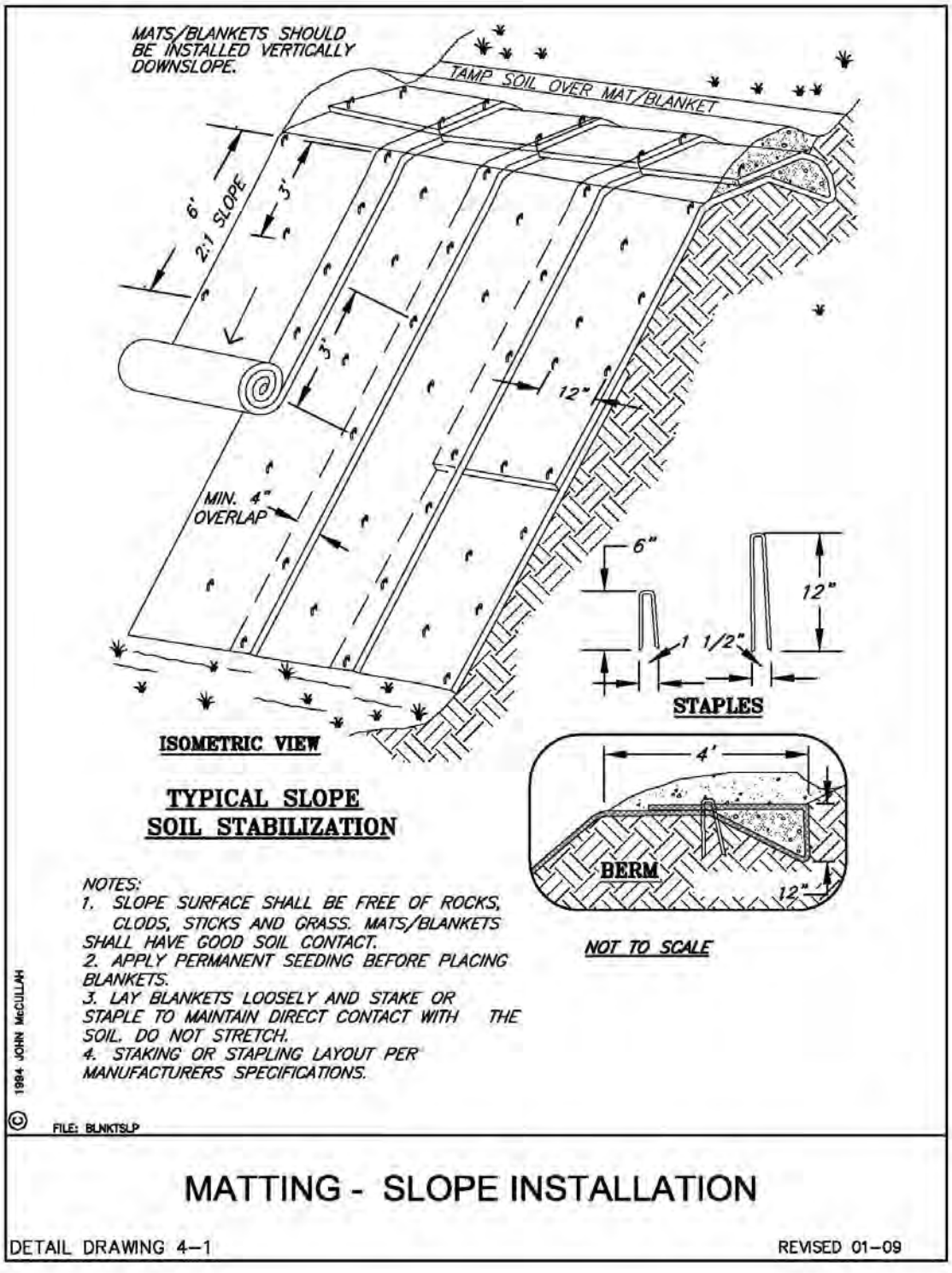
- Generally used on slopes 2:1 and steeper.
- Surface must be graded smooth.
- Remove all debris and undulations larger than 2 inches in any dimension.
- Apply seed and fertilizer prior to matting.
- Install so that matting is in complete contact with soil surface.
- See **Table 4-3** for matting application and refer to manufacturer's specifications for staple pattern.
- Organic matting materials (excelsior, jute and coir) biodegrade and are useful for applications requiring stabilization for up to three months. Use organic blankets, which retain moisture and provide organic matter to the soil, for slope protection and short-term waterway protection and to improve the speed and success of revegetation.
  - Excelsior brand (aspen wood fibre), woven straw, and coir (coconut fiber) blankets may be installed without mulch because they provide complete surface protection.
- Synthetic mats are made from non-biodegradable material and will remain in place for years (some photodegradation does occur). Use purely synthetic blankets for long-term stabilization of waterways.
  - Turf Reinforcement Mats (TRM) are made from polymer netting or monofilaments formed into a Synthetic 3-D mat. TRMs protect seed and increase germination and also acts as part of the root structure; giving the turf higher strength.
  - Erosion Control and Revegetation Mats (ECRM), composed of heat-fused monofilaments or monofilaments stitched between netting act as permanent mulch. ECRM allow growth through the mat.
- Channel or swale applications:
  - Lengthwise overlap: Min. 12 inches
  - Crosswise overlap: Min. 6 inches
  - Avoid joining material in center of ditch or swale
- Slope application:

- Lengthwise overlap: Min. 6 inches
- Crosswise overlap: Min. 6 inches
- At top of slope, entrench material in a 6 inch X 6 inch trench and staple at 12 inch intervals
- At bottom of slope, extend mat 2 feet beyond the toe of the slope, turn material under 4 inches and staple at 12 inch intervals
- On 4:1 slopes, rolls can be placed in horizontal strips
- Mats must be stapled in place as they are installed down the slope face every 4 feet until you reach the bottom. This keeps blanket in relaxed position, eliminating the potential for under-rilling.

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Repair any damaged areas of the net or blanket and staple into the ground any areas not in close contact with the ground surface.
- If erosion occurs, repair and protect the eroded area.


MATS/BLANKETS SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.
TAMP SOIL OVER MAT/BLANKET
6'
2:1 SLOPE
3'
3'
12"
MIN. 4" OVERLAP
6"
12"
1 1/2"
STAPLES
ISOMETRIC VIEW
4'
BERM
12"
NOT TO SCALE
TYPICAL SLOPE SOIL STABILIZATION
NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.
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FILE: BLNKTSLP
MATTING - SLOPE INSTALLATION
DETAIL DRAWING 4–1
REVISED 01–09

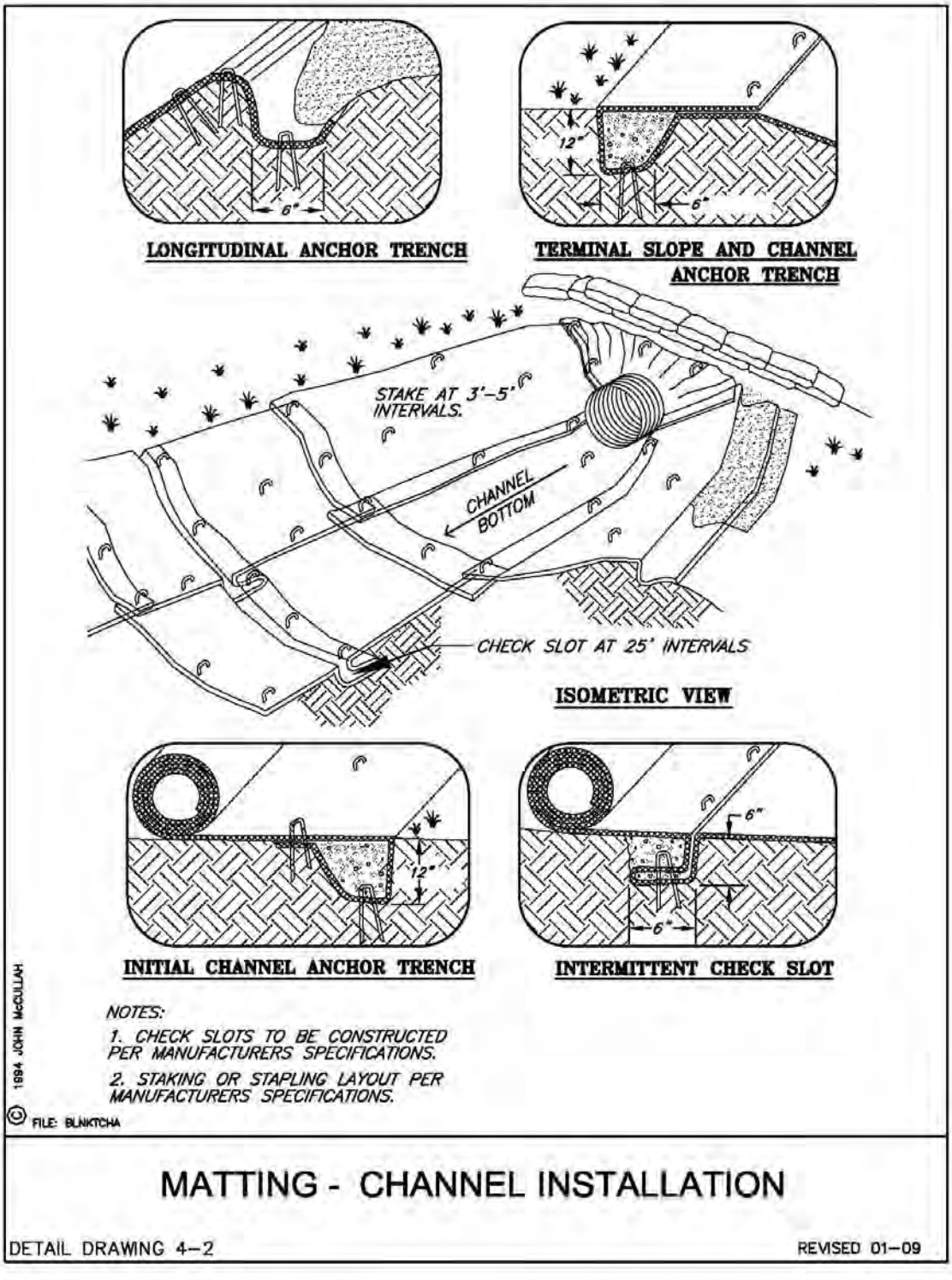

6"
LONGITUDINAL ANCHOR TRENCH
12"
6"
TERMINAL SLOPE AND CHANNEL ANCHOR TRENCH
STAKE AT 3'-5' INTERVALS.
CHANNEL BOTTOM
CHECK SLOT AT 25' INTERVALS
ISOMETRIC VIEW
12"
INITIAL CHANNEL ANCHOR TRENCH
6"
6"
INTERMITTENT CHECK SLOT
NOTES:
1. CHECK SLOTS TO BE CONSTRUCTED PER MANUFACTURERS SPECIFICATIONS.
2. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.
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MATTING - CHANNEL INSTALLATION
DETAIL DRAWING 4-2
REVISED 01-09

Table 4-3 Matting Specifications

Matting Type	Slope/Channel Application	Netting Type
Straw	3:1 or less	Type 1 - Photo degradable polypropylene top/bottom Type 2 - 100% Bio degradable (used near sensitive habitat areas)
Straw/Coconut	2:1 or less	Type 1 – Photo degradable polypropylene top/bottom Type 2 – 100% Bio degradable (used near sensitive habitat areas)
Coconut	1:1 or less Low flow channels	Type 1 – Photo degradable polypropylene top/bottom Type 2 – 100% Bio degradable (used near sensitive habitat areas)
Jute	3:1 or less Short, 2:1 slopes	100% Bio degradable
Excelsior	2:1 or less Low flow channel	Photo degradable extruded plastic mesh top/bottom
Coir fabric	1:1 or less 8-10 fps channel	Type 1 – 1 inch grid 100% Bio degradable (4-10 year life) Type 2 – ½ inch grid 100% Bio degradable (4-10 year life) Type 3 – ¼ inch grid 100% Bio degradable (4-10 year life)
TRM	High flow channels 8-20 fps	Three dimensional synthetic polyolefin fibers mechanically bonded between two nets.

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PLASTIC SHEETING



4.1.6 Plastic Sheeting

Provides immediate protection to slopes and stockpiles. Plastic sheeting has been known to transfer erosion problems because water will sheet flow off the plastic at high velocity. This is usually attributable to poor application, installation and maintenance. Use alternatives to plastic covering whenever possible.

Advantages

- Provides immediate, short-term erosion protection to slopes that are prone to erosion and stockpiles.
- Fairly quick and easy to install.

Disadvantages

- Plastic sheeting may concentrate sunrays and burn the vegetation beneath it.
- Material generates high velocity runoff.
- Plastic breaks down quickly when exposed to ultraviolet radiation.
- Plastic, when it is not completely removed, can clog drainage system inlets and outlets.
- If not properly anchored, wind may transport plastic onto roadways and create traffic hazard.
- Not effective for preventing illegal discharge

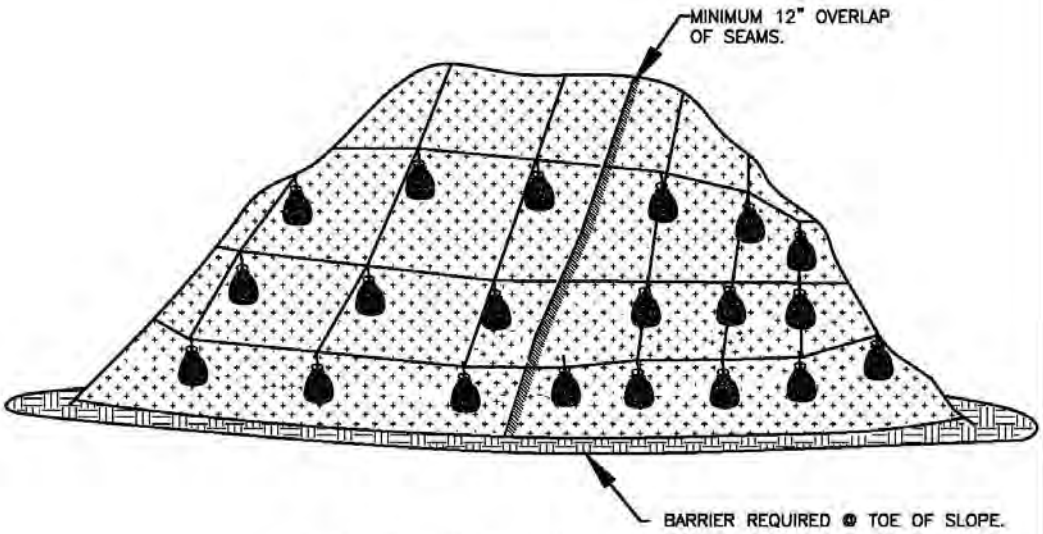
Design Criteria

- Do not use plastic covering upslope of areas such as steep and/or unstable slopes that might be adversely affected by concentrated runoff.
- When possible, install an interceptor dike at the top of the plastic to divert flows away from the plastic.
- Toe-in the top of the sheeting in a 6 inch X 6 inch trench backfilled with compacted native material.
- Install a gravel berm, riprap, or other suitable protection at the toe of slope in order to dissipate runoff velocity.
- Anchor the plastic using sandbags or other suitable tethered anchoring system spaced on a 10 foot grid spacing.
- Overlap seams 1-2 feet, tape, roll and stake the seams and then weigh down the entire length.

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Replace torn sheets and repair open seams.
- Completely remove and replace plastic when it begins to deteriorate.
- Completely remove all plastic once it is no longer needed.
- Check anchoring system and repair or add anchors.



PLASTIC SHEETING

NOTES:
1. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.
2. BARRIER REQUIRED @ TOE OF STOCK PILE.
3. COVERING MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR TIRES ON ROPES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.

PLASTIC SHEETING

DETAIL DRAWING 4–3

REVISED 01–09

PRESERVE NATURAL VEGETATION



4.1.7 Preserve Natural Vegetation

This BMP involves preserving natural vegetation to the greatest extent possible during the construction process, and after construction where appropriate. Maintaining natural vegetation is the most effective and inexpensive form of erosion prevention control. This method is particularly important in sensitive areas such as wetlands, stream corridors, lakes, and near steep slopes. The project manager, inspector and contractor should address and discuss preserving natural vegetation during the Pre-construction meeting. Although this is a proven BMP, it is imperative that all exposed soils are covered in a timely manner.

Advantages

- Helps reduce soil erosion and runoff while beautifying an area.
- Saves landscaping costs, provides areas for wildlife, and provides visual screening.
- Helps maintain water temperature. Temperature moderation is especially important when detention ponds drain to salmonid-bearing streams.
- Retains existing shade and cover habitat.

Disadvantages

- Retaining older trees could create a safety hazard.
- May constrict area available for construction activities.

Design Criteria

- Coordinate with the Landscape Architect and Environmental Professionals assigned to the project when determining what to save and how to save it.
- Vegetation can be preserved in natural clumps or as individual trees, shrubs and vines.
- Clearly establish ground disturbance limits outside the dripline of preserved trees, using orange construction safety fence or flagging if approved
- Protect vegetation from:
  - Construction equipment injury above or below the ground level. Injury occurs from scarring, cutting roots, or compaction.
  - Grade changes, which affect the plants' ability to obtain air, water or minerals. Placing a layer of gravel and a tile system over the roots before a major fill allows air to circulate and protects the plant from the fill.
- Terracing the area around the plant, or leaving the plants on an undisturbed mound can increase the plants' survival chances.
  - Root exposure.

- Damage caused by excavations for tile, water and sewer lines.

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Repair fencing and/or flagging
- Re-cover and/or seal exposed plant roots.

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SEEDING
TEMPORARY/PERMANENT



4.1.8 Seeding (Temporary/Permanent)

A well-established vegetative cover is one of the most effective methods of reducing erosion. Vegetation should be established on construction sites as the slopes are finished, rather than waiting until all the grading is complete. Equally important and often overlooked is temporary or permanent irrigation. **Temporary or permanent seeding applications must be completed prior to September 1st of that year.**

Advantages

- Eliminates splash erosion
- Traps sediment.
- Promotes infiltration
- Improves appearance of the site.
- Reduces runoff velocities
- Provides excellent stabilization.
- Relatively inexpensive erosion control measure.
- Effective for dust control

Disadvantages

- Needs sufficient time for seed to establish.
- Requires mulch or other cover until vegetation is established.
- May require fertilizer and lime to establish on poor soils.
- Requires irrigation.
- Must be removed prior to applying fill material.

Design Criteria

The following discussion presents general information regarding seeding, bed preparation, mulching and fertilizing.

Selection Criteria

Standard grass and legume seed mixes for erosion control purposes are developed by local or regional distributors, for site specific applications. Often more than one plant species is selected so that at least one species will do well given the extreme seasonal fluctuations that occur in nature. Specific plant characteristics are chosen when developing an erosion control seed mix. Grass species are normally used rather than other plant species because of their fibrous root systems and quick establishment.

Seedling vigor is an important plant characteristic to consider for erosion control seeding because the goal is to have rapid establishment and a dense fibrous root system. This holds the

soil in place and provides a thick canopy over the soil to break the raindrop velocity. Some grasses do well early in the season and can act as nurse or cover crops until the slower growing species can establish. Seed mixes are developed for specific climatic zones around the state to match the optimum growing conditions for each species.

One grass seed characteristic that is considered is the season that predominant growth will occur. Grass species are often characterized as being either warm or cool season grasses. A warm season grasses, such as bluegrass, will have its predominant growth during the warm months of the year. Conversely, cool-season grasses, like hard fescue, have its predominant growth in the cool weather and produces seeds in the early spring. To obtain optimize establishment, a cool or warm season grass, or both, may be used depending on whether the seed is planted in the spring or fall.

Another plant characteristic of importance in erosion control is the method by which the grass develops, grows and spreads. Grasses can be either rhizomatous, whereas the grass plant will send out runners that will start new growth, a bunch grass, or a sod-forming grass. Rooting depth is important and grasses are characterized as being deep, moderate and shallow rooting for erosion control purposes. The mixture of rooting depths provides optimum support for soils and best enables the removal of water by the roots at the various zones in the soil.

Seed Purity

All seed furnished to the operator should be those specified in the project plan and should be measured by Pure Live Seed (PLS) weight. Pure live seed refers to the portion of a seed lot that is live seed of the desired kind. The purpose of measuring the application on a PLS basis is so that trash and empty seeds do not confuse seeding rate calculations.

All seeds applied for temporary erosion control must be certified in accordance with the Standard Specifications. Seed certification insures varietal purity and seed quality. The seed label must have the following information included:

- Origin.
- The kind and variety of each seed in a mixture, of 3% or more.
- Percent of germination - the percentage of the pure seed that has started to grow by the end of the specified test period. Germination declines with the age of the seed, the variety and storage conditions - always check the date of the test. Total germination for the purpose of PLS calculations is equal to the percent germination from seed test plus percent hard seed.
- Percent of pure seed - the percentage of seed without dirt, dust, chaff, straw, empty kernels, weed, other crops, and other foreign matter. Purity, inert matter, weed seed, other crop seed, and hard seed percentages are shown on the seed tag - they add up to 100%.

- Percent and kind of other crop – the percentage of crop seed other than the specified crop as labeled.
- Percent of inert matter - the percentage by weight of broken seeds one-half or less of full size and all other dead foreign material.
- Percent of weed seed - the percentage by weight of seeds considered weeds by law.
- Percent of noxious weed seed - the percentage of seed considered noxious by law.
- Percent of hard seed - the percentage by weight of the labeled crop that remain sound but do not germinate at the end of the test periods. They may germinate later.
- Test date (month and year).
- Name and address of labeler.
- Name and number per pound of restricted noxious weed seeds present.
    - Lot weight.

The label must be correct. The purity, germination and other information on the tag must be backed by a seed lab analysis report. High quality seed germinates well, has a high purity percentage, and is free of noxious weeds. The identity, purity and uniformity of the seed must be maintained at all times. The seed is tested and must meet the minimum seed standards. Lots showing Oregon prohibited weeds are not approved. Seed must meet minimum viability standards. Oregon State University Extension Service keeps a listing of seed varieties that are certified in the OSU Extension Certified Seed Handbook. The seed variety must be approved by the OSU Seed Certification Board to be eligible for certification or meet the standards for certification.

- Temporary grass cover measures must be fully established by October 1st or other ground cover measures will have to be implemented. In order to establish an 80% healthy stand of grass, all seeding applications must be completed prior to September 1st.
- Apply permanent seeding when no further disturbances are planned.
- Seed should be applied immediately after seedbed preparation while the soil is loose and moist.
- Apply seed before applying straw mulch or other ground cover applications.
- Hydromulch shall be applied with grass seed at a rate of 2000 lb./acre. On slopes steeper than 10 %, hydroseed and mulch shall be applied with a bonding agent (tackifier). Application rate and methodology to be in accordance with seed supplier recommendations. (See Appendix C for help)
- Dry, loose, weed-fee straw used as mulch shall be applied at double the hydromulch application requirement (4000 lb./acre). Anchor straw by working in by hand or with equipment (rollers, cleat tracks, etc).

- Permanent or temporary irrigation shall be supplied especially in abnormally hot or dry weather or on adverse sites. Water application rates should be controlled to provide adequate moisture without causing runoff.

Site Preparation

- Bring the seedbed area to final grade, remove all rocks and debris, and smooth surface undulations larger than 2 inches.
- Divert concentrated flows away from the seeded area.
- For optimum seeding conditions preserve topsoil and stockpile material until final grades are established. Spread topsoil over new grades or:
- Conduct soil test to determine pH and nutrient content.
- Roughen the soil by harrowing, tracking, grooving or furrowing.
- Apply amendments as needed to adjust pH to 6.0-7.5. Incorporate these amendments into the soil.
- The seedbed should be firm but not compact. The top 4-6 inches of soil should be loose, moist and free of large clods and stones.
- If the seedbed has been idle long enough for the soil to become compact, the topsoil should be harrowed with a disk, spring tooth drag, spike tooth drag, or other equipment designed to condition the soil for seeding.
- Harrowing, tracking or furrowing should be done horizontally across the face of the slope, so ridges are along the slope contour.

Seeding

- Seed to soil contact is the key to good germination.
- Apply seed at the rates specified using calibrated seed spreaders, cyclone seeders, mechanical drills, or hydroseeder so the seed is applied uniformly on the site
- Broadcast seed should be incorporated into the soil by raking or chain dragging, and then lightly compacted to provide good seed-soil contact.
- Apply mulch and tackifier or matting, as specified, over the seeded areas.
- To prevent seed from being washed away, confirm installation of all required surface water control measures.
- Double the rate of seed application when mulch and seed is applied in a single application.
- Recommended erosion control grass seed mixes are as follows. Similar mixes designed to achieve erosion control may be substituted if approved by local jurisdiction:
    1. Dwarf Grass Mix (low height, low maintenance)
       Dwarf Perennial Ryegrass, 80% by weight

Creeping Red Fescue, 20% by weight
Application rate: 100 pounds minimum per acre

2. Standard Height Grass Mix
   Annual Ryegrass, 40% by weight
   Turf-type Fescue, 60% by weight
   Application rate: 100 pounds minimum per acre

Fertilizer

- Slow-release fertilizers are more efficient and have fewer environmental impacts. Areas being seeded for final landscaping may require soil tests to determine the exact type and quantity of fertilizer needed to prevent the over-application of fertilizer. Use non-phosphorus fertilizer on disturbed areas within 50 feet of water bodies and wetlands.
- The use of stockpiled topsoil or compost reduces the need for fertilizer and improves the overall soil quality.
- Provide project-specific application rates

Mulch

- Refer to Ground Cover and Matting sections of this chapter.
- Straw mulch in loose condition is preferred for seeding during the wet season on slopes 3:1 or flatter.
- Straw mulch may be required during the dry season if:
  - Grass growth is expected to be slow;
  - The soils are highly erodible;
  - There is a water body close to the disturbed area; or
  - Significant precipitation is anticipated before the grass will provide effective cover.
- The straw mulch shall not be moldy, caked, decayed or of otherwise low quality.
- Can be applied on top of the seed or applied with the seed during hydroseeding. The application rate of seed per acre should be increased if seed and mulch are applied in a single application.

Hydroseed

- Refer to Hydraulic Application section of this chapter
- Hydroseeding requires a mulch or green dye tracer as a visual aid during application.
- On slopes steeper than 2:1, hydroseeding requires an increased rate of tackifier to be applied.

- During the dry season, hydroseeding with wood fiber mulch is adequate.

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Newly seeded areas need to be inspected frequently to ensure the grass is growing.
- If the seeded area is damaged due to runoff, additional BMP's may be needed. Re-seed and mulch damaged areas.
- Spot seeding can be done on small areas to fill in bare spots where grass did not grow properly.
- If spot seeding is ineffective, use an alternate method, such as sod or matting.
- Re-seed and protect with mulch any areas affected by erosion. If the erosion is caused by concentrated runoff, fix the runoff problem and then re-seed and mat the area.

4.1.9 Sod

Establishes permanent turf for immediate erosion protection and stabilizes drainageways.

Advantages

- Provides immediate, effective protection, and is aesthetically pleasing.
- Provides high-density vegetation, which is superior to a recently seeded area.
- Placement can occur any time that soil moisture is adequate and the ground is not frozen.

Disadvantages

- Expensive.
- Availability is seasonal.
- Irrigation may be required if installed in summer.
- Difficult to mow if installed on slopes steeper than 3:1.
- Installations in grassed waterways may roll up if not anchored or drained properly.
- Time necessary for root establishment may be lengthy.

Design Criteria

- Use sod as a short or long-term cover.
- Around inlets located off roadways
- Use sod that is generally weed free, has uniform thickness (approximately 1 inch thick) and dense root mat for mechanical strength.
- Generally inappropriate for bioswales. Sod can be used for lining ditches or waterways carrying intermittent flows.
- The following steps are general recommendations for sod installation:
  - Shape and smooth the surface to final grade in accordance with the approved grading plan.
  - Fertilize as per supplier's recommendations. Non-phosphorous fertilizer is required near water bodies and wetlands.
  - Work lime and fertilizer into soil 1-2 inches deep and smooth the surface.
  - Lay sod strips perpendicular to the direction of water flow, beginning at the lowest area to be sodded. Wedge strips securely into place and square the ends of each strip to provide for a close, tight fit. Stagger joints at least 12 inches. Staple sod onto 3:1 and steeper slopes.
    - Roll the sodded area and irrigate.
    - Not for use in high velocity channels/ditches

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Inspect sod area frequently for soil moisture content and root establishment.
- Re-tack, re-sod or re-seed as necessary.
- If it is impossible to establish a healthy ground cover due to frequent saturation, instability, or some other cause; remove the sod, seed the area with an appropriate mix, and protect with matting.

4.2 Runoff Control Practices

The greater the volume and velocity of surface water runoff on construction sites, the more sediment and other pollutants are transported to streams, wetlands, and lakes. Diverting runoff away from exposed soils can greatly reduce the amount of soil eroded from a site. Decreasing runoff velocities reduces erosion and the amount of pollutants carried off-site.

Runoff controls divert runoff from exposed areas and reduce runoff velocities. Runoff control BMP's that divert runoff from exposed areas include pipe slope drains and diversion swales. Runoff control BMP's that reduce runoff velocities include check dams and sediment traps.

1. Check Dam
2. Diversion Dike/Swale
3. Grass-lined Swale
4. Outlet Protection
5. Pipe Slope Drain
6. Surface Roughening

CHECK DAM



4.2.1 Check Dam

Small dams constructed across a swale or ditch to reduce velocities of concentrated flows, thereby reducing erosion in the swale or ditch. Check dams not only prevent gully erosion from occurring before vegetation is established, but also allow a significant amount of suspended sediment to settle out.

- Check Dams can be constructed from a variety of materials.
  - Rock: Rock material only.
  - Bio-filter Bags: Bio-filter bags staked to the ground.
  - Sand Bags
  - Pre-fabricated Check Dam System: A manufactured system specifically designed to slow water so that suspended particles settle out. Field fabricated systems are not allowed.

Advantages

- Prevent erosion and promote settling of sediment in runoff.
- When carefully located and constructed, check dams may function as permanent installations.
- Reduces flow velocity
- Inexpensive and easy to install.
- Rock can be spread into ditch and used as a channel lining when the check dam is no longer necessary.
- Some pre-fabricated check dams are reusable.

Disadvantages

- Removal may be costly for some types of check dams.
- Suitable only for a limited drainage area.
- May reduce hydraulic capacity of the channel.
- May create turbulence downstream, causing erosion of the channel banks.
- Ponded water may kill grass in grass-lined channels.
- May be an obstruction to construction equipment.

Design Criteria

- Space check dams according to the following table.

Table 4-4 Spacing for check dams

Ditch Grade	Minimum Weir Depth		
	6 inch	12 inch	18 inch
6%	**	16 ft O.C.	26 ft O.C.
5%	**	20 ft	30 ft
4%	**	26 ft	40 ft
3%	15 ft	33 ft	50 ft
2%	25 ft	50 ft	80 ft

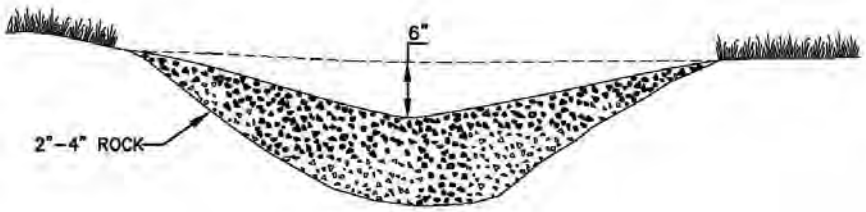
** Not Allowed

- In temporary or permanent channels not yet vegetated when installing channel lining is not feasible.
- In small open channels that drain 10 acres or less.
- Not for use in streams or rivers.
- Construct rock check dams sized to stay in place given the expected design flow velocity. Typical rock size of 3-6 inch. Place rock by hand or by mechanical means rather than dumping the rock.
- Bridge entire ditch or swale width and ensure the center of the dam is 6 inches lower than the outer ends.
- Remove check dams from grass-lined ditches and swales once the grass is established.
- Seed, mulch, or mat the area where the check dams were, immediately following removal.

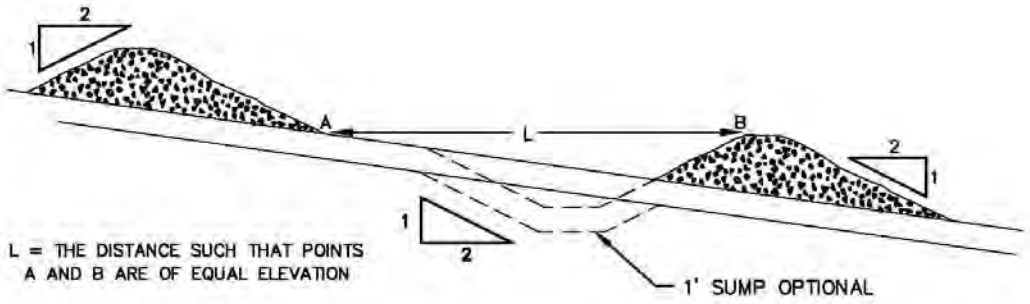
Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Remove sediment once it reaches one-third the depth of the rock weir.
- Replace rock weir when filtering capacity is reduced by one-half.



ROCK CHECK DAM

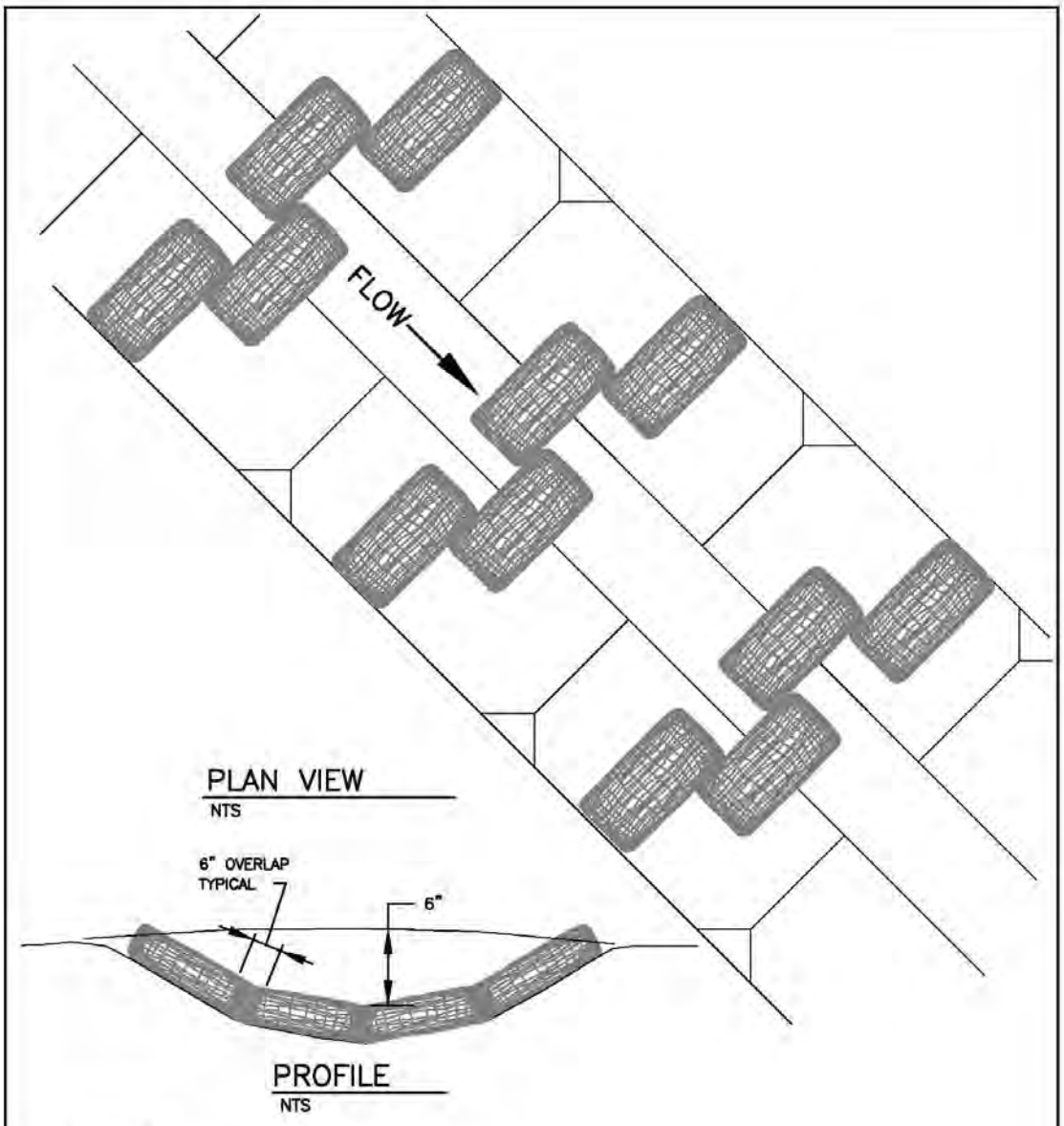


SPACING BETWEEN CHECK DAMS

CHECK DAM - ROCK

DETAIL DRAWING 4–4

REVISED 01–09



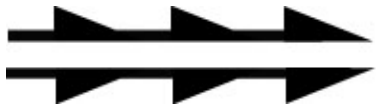
NOTES:

1. STAKING OF BAGS REQUIRED USING (2) 1"X2" WOOD STAKES OR APPROVED EQUAL PER BAG.
2. SURFACE MUST BE SMOOTH BEFORE APPLICATION.
3. CHECK DAMS CAN BE CONSTRUCTED USING STRAW WATTLES OR OTHER MATERIALS AS APPROVED BY THE DISTRICT OR CITY.

CHECK DAM - BIO-FILTER BAGS

DETAIL DRAWING 4–5 REVISED 01–09

DIVERSION DIKE/SWALE



Diversion Dike/Swale



Diversion Dike



Diversion Swale



4.2.2 Diversion Dike/ Swale

A ridge of compacted soil or a lined swale with vegetative lining located at the top, base or somewhere along a sloping disturbed area. The dike or swale intercepts and conveys smaller flows along low-gradient drainage ways to larger conveyances such as ditches or pipe slope drains or to a stabilized outlet. Dikes and swales may be used singly or in combination with each other.

Advantages

- Provides a practical, inexpensive method to divert runoff.
- Can handle flows from large drainage areas.
- Use on-site material and equipment to construct.

Disadvantages

- If improperly constructed, can contribute to erosion caused by concentrating the flow.
- High flow velocity can damage vegetation.
- Not effective for preventing illegal discharge.

Design Criteria

- Refer to Table 4-5 Dike Design Criteria and Table 4-6 Swale Design Criteria.
- Install the dike and/or swale horizontally at intervals across a disturbed slope. Space horizontal interceptor dikes and swales according to Tables 4-6 and 4-7.
- For slopes of erodible soils, steeper than 2:1 with more than 10 ft. of vertical relief, construct benches or shorten distance between dikes or swales.
- If the dike or swale intercepts runoff from disturbed areas, discharge the runoff to a stable conveyance that routes the runoff to a sediment trap or basin.
- If the dike or swale intercepts runoff that originates from undisturbed areas, discharge the runoff to a stable conveyance that will route the runoff downslope of any disturbed areas and release the water at a stabilized outlet.
- May need matting to protect seed bed and channel from erosion.

Table 4-5 Diversion dike design criteria

Top Width	2 ft. min.	
Height	18 in. min. Measured from upslope toe and at a 90% standard proctor compaction ASTM D698.	
Side Slopes	2H:1V or flatter	
Grade	Topography Dependent	
Dike grade	Maximum 5%	
Slope of Disturbed Area vs. Horizontal Spacing	<5%	300 ft
	5-10%	200 ft
	10-25%	100 ft
	25-50%	50 ft
Slope Stabilization	<5% Seed and mulch within 5 days following dike construction	
	5-40% Stabilize immediately using either sod or riprap.	
Outlet	Upslope side of dike provides positive drainage to the outlet. Provide energy dissipation as necessary to prevent erosion. Release sediment-laden runoff to a sediment trapping facility.	

Table 4-6 Diversion swale design criteria

Bottom Width	2 ft. min. The bottom should be level across the swale.	
Depth	1 ft.	
Side Slopes	2:1 or flatter	
Grade	Maximum 5% with positive drainage to a suitable outlet.	
Slope of Disturbed Area vs. Horizontal Spacing	<5%	300 ft.
	5-10%	200 ft.
	10-25%	100 ft.
	25-50%	50 ft.
Slope Stabilization	Temporarily seed or line with riprap 12 in. thick and press into the bank approximately 3-4 in.	
Outlet	Level spreader or riprap to stabilized outlet/sedimentation pond.	

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Immediately repair damage resulting from runoff or construction activity
- If the dike or swale regularly overflows, increase the capacity and/or frequency of the dikes/swales.
- Inspect and repair as necessary after every major storm.
- Minimize construction traffic over temporary dikes and swales.
- Clean out clogged pipes (as part of the swale system) under roads.

4.2.3 Grass-lined Swale

A channel with vegetative lining constructed to convey and dispose of concentrated surface runoff without damage from erosion, deposition, or flooding.

Advantages

- Does not generate high velocity runoff and offers temporary slope protection, which is superior to plastic sheeting.
- Capture a great deal of sediment due to the filtering effect of vegetation.
- Usually easy to install.

Disadvantages

- Requires temporary irrigation to establish vegetation.
- Cannot be used until vegetation is established.

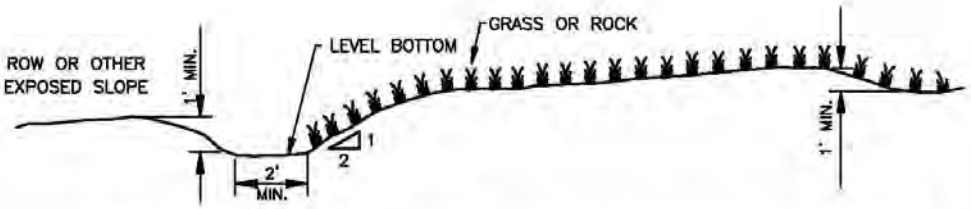
Design Criteria

- As a minimum, grass-lined channels should carry a peak runoff from a 10-year storm event without eroding. Where flood hazards exist, increase the capacity according to the potential damage. The allowable design velocity for grassed-lined channels is based on soil conditions, type of vegetation, and the method of establishment. The channel shape may be parabolic, trapezoidal, or v-shaped, depending on the need and site conditions. Small check dams or flow spreaders may be necessary to minimize channelization.

Inspection & Maintenance

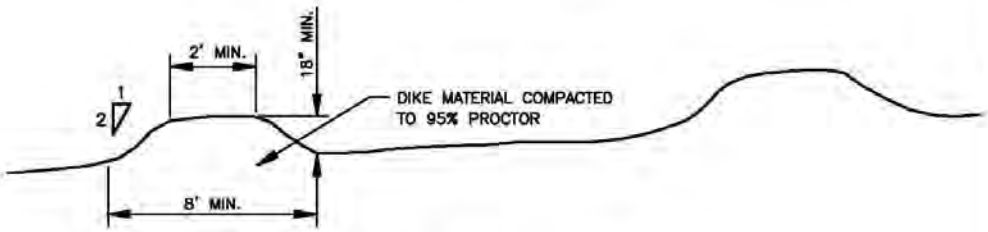
Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- During the initial establishment, grass-lined channels should be repaired and grass re-established if necessary.
- After grass has become established, the channel should be checked periodically to determine if the channel is withstanding flow velocities without damage.
- Check the channel for debris, scour, or erosion and immediately make repairs. It is particularly important to check the channel outlet and all road crossings for bank stability and evidence of piping or scour holes and make repairs immediately.
- Remove all significant sediment accumulations to maintain the designed carrying capacity.
- Keep the grass in a healthy, vigorous condition at all times, since it is the primary erosion protection for the channel.
- Permanent grassed waterways should be seasonally maintained by mowing and/or irrigating, depending on the type of vegetation selected.
- Newly seeded areas need to be inspected frequently to ensure the grass is growing.
- If the seeded area is damaged due to runoff, additional storm water measures such as check dams or matting may be needed.



BOTTOM WIDTH	2 FEET MINIMUM; THE BOTTOM WIDTH SHALL BE LEVEL
DEPTH	1 FOOT MINIMUM
SIDE SLOPE	2H:1V OR FLATTER
GRADE	MAXIMUM 5 PERCENT, WITH POSITIVE DRAINAGE TO A SUITABLE OUTLET (SUCH AS SEDIMENTATION POND)

DIVERSION SWALE



TEMPORARY DIVERSION DIKE

Slope	Spacing
<5%	300 feet
5–10%	200 feet
10–25%	100 feet
25–50%	50 feet

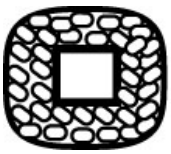
NOTE:
IMMEDIATELY UPON CONSTRUCTION, ESTABLISHED VEGETATION OR EROSION CONTROL BLANKETS ARE REQUIRED.

DIVERSION DIKE / SWALE

DETAIL DRAWING 4–6 REVISED 01–09

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OUTLET PROTECTION







4.2.4 Outlet Protection

Outlet protection reduces the speed of concentrated flow, thereby preventing scour at conveyance outlets. By dissipating energy, outlet protection lowers the potential for downstream erosion. Outlet protection includes riprap-lined basins, concrete aprons, and settling basins. Outlet protection prevents scour at storm water outlets, and minimizes the potential for downstream erosion.

Advantages

- Many techniques are effective and relatively inexpensive and easy to install.
- Removes sediment and reduces velocity.

Disadvantages

- Can be unsightly.
- May be difficult to remove sediment without removing and replacing the structure itself.
- Rock outlets with high velocity flows may require frequent maintenance.

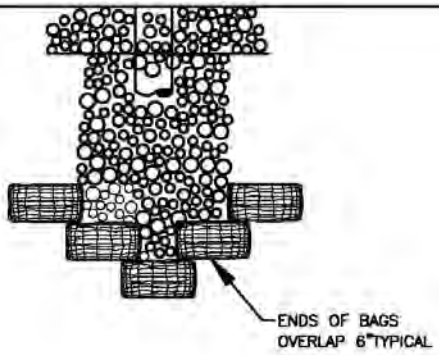
Design Criteria

- Use the standard detail for outlet protection as a minimum. Consider site conditions to determine if a more complex energy dissipater may be required.
- At the outlets of ponds, pipe slope drains, ditches, or other conveyances, and where runoff is conveyed to a natural or man-made drainage feature such as a stream, wetland, lake, or ditch.

Inspection & Maintenance

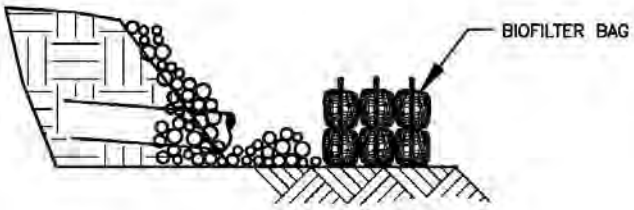
Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- If there is scour at the outlet, protect the eroded area by increasing the size of the energy dissipater facility.
- Remove accumulated sediment frequently.



PLAN VIEW

NTS

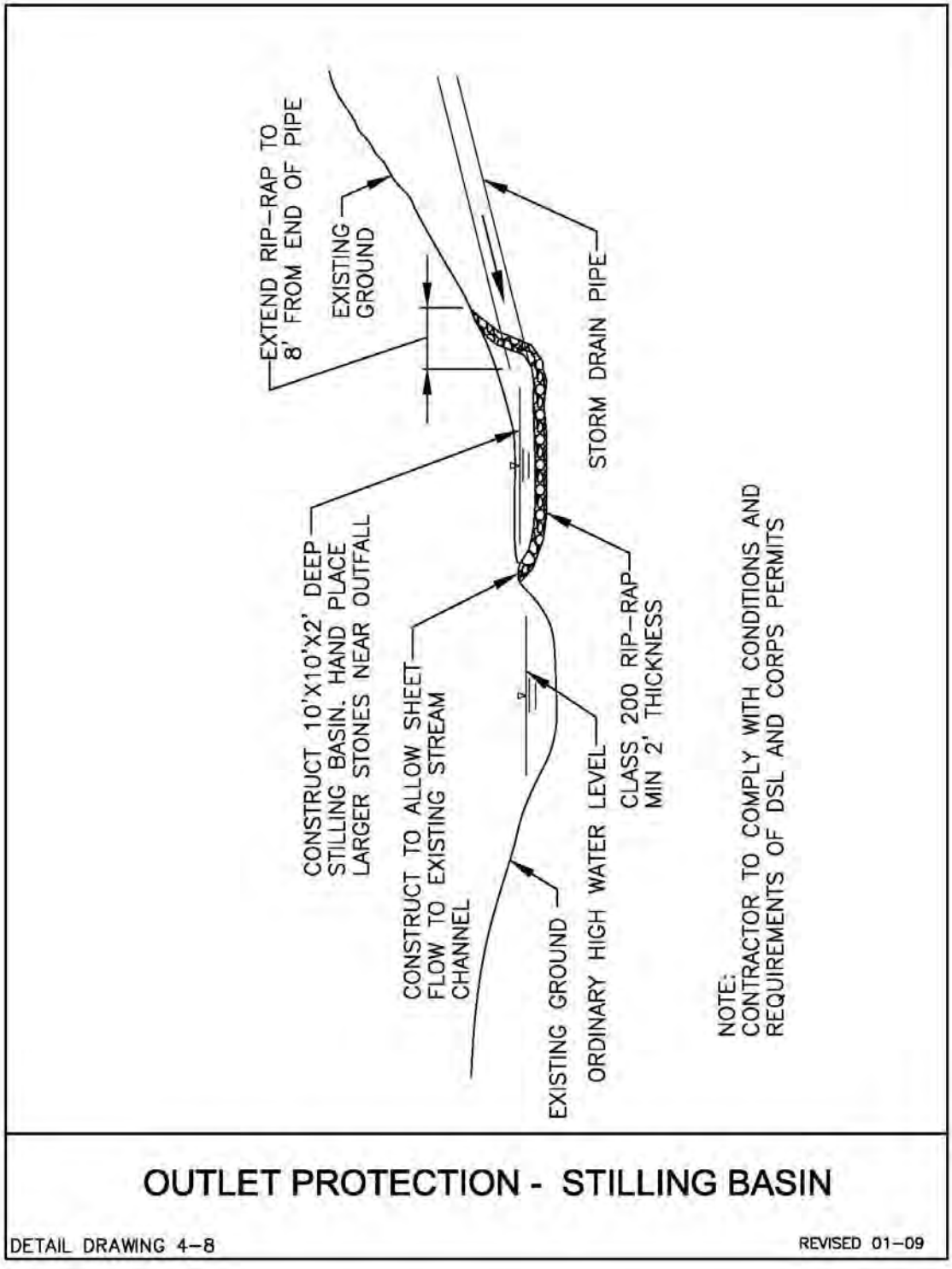


PROFILE

NOTE:
1. BIO BAGS ONLY REQUIRED WHEN DISCHARGING SEDIMENT LADEN WATER.
2. STAKING OF BAGS REQUIRED WITH EITHER METHOD USING (2) 1"x 2" WOOD STAKES OR APPROVED EQUAL PER BAG.

OUTLET PROTECTION - RIP RAP

DETAIL DRAWING 4–7 REVISED 01–09



OUTLET PROTECTION - STILLING BASIN

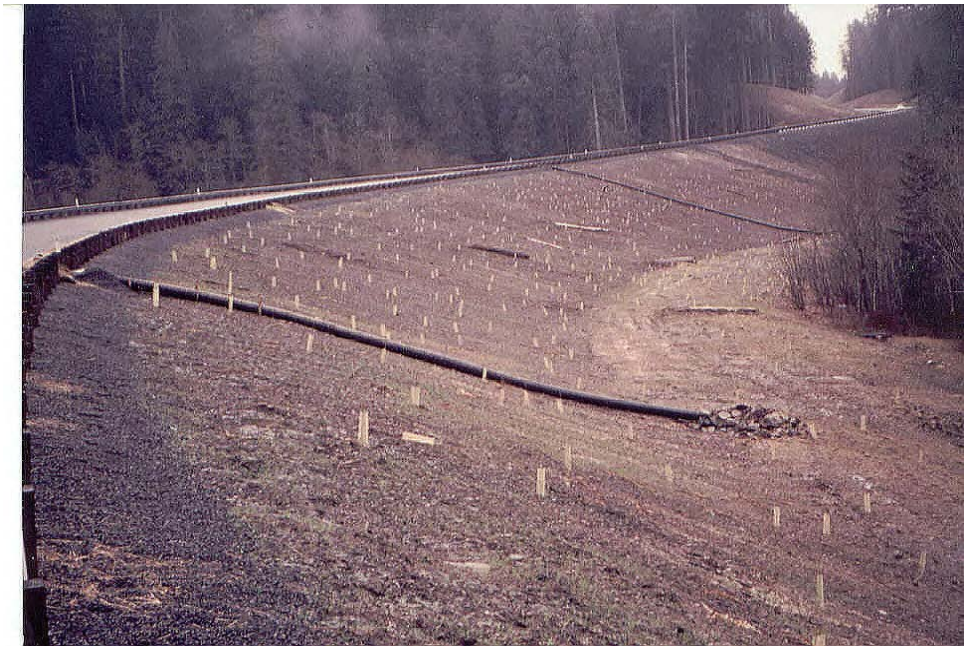
DETAIL DRAWING 4-8

REVISED 01-09

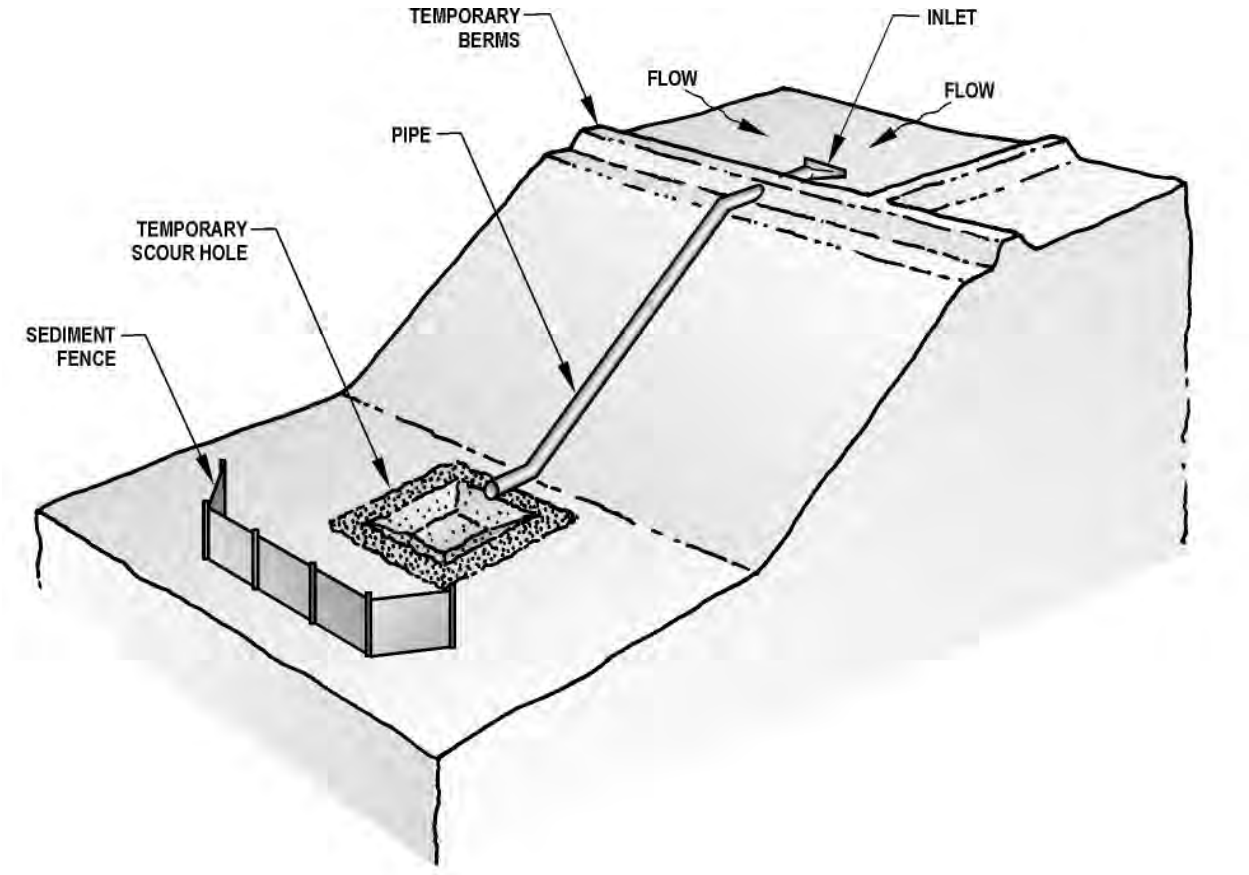
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PIPE SLOPE DRAIN





4.2.5 Pipe Slope Drain



A pipe extending from the top to the bottom of a cut or fill and discharging into a stabilized watercourse, sediment trapping device or onto a stabilized area. The pipe slope drain carries concentrated runoff down steep slopes without causing gullies, erosion, or saturation of slide-prone soils.

Advantages

- Effective method of conveying water down steep slopes.
- Reduces or eliminates erosion.
- Easy installation and little maintenance.

Disadvantages

- Drain can be under-designed or incorrectly located.
- Area cleared for drain installation requires stabilization to prevent erosion occurring under the pipe.

- Outfall systems constructed of pipe segments, which are banded and/or gasketed together, could develop leaks causing erosion and failure of the system. Failures on erodible or steep slopes can cause downstream sedimentation or even mudflows.
- Adjustment of pipe lengths is necessary as cut and fill slopes are extended.

Design Criteria

- Capacity – Peak runoff from a 10-yr storm. Inlet control is a critical factor when sizing pipes. Unless they are individually designed, size drains according to Table 4-4.
- On any slope where a large amount of flow must be collected and conveyed to avoid erosion.
- Areas where clean water should be kept separate from sediment-laden water.
- If a permanent measure is needed it should be designed as part of the roadway drainage facilities.

Table 4-7 Slope drain sizes

Contributing Drainage Area (Maximum)	Pipe Diameter
0.50 acre	12 inch
0.75 acre	15 inch
1.00 acre	18 inch

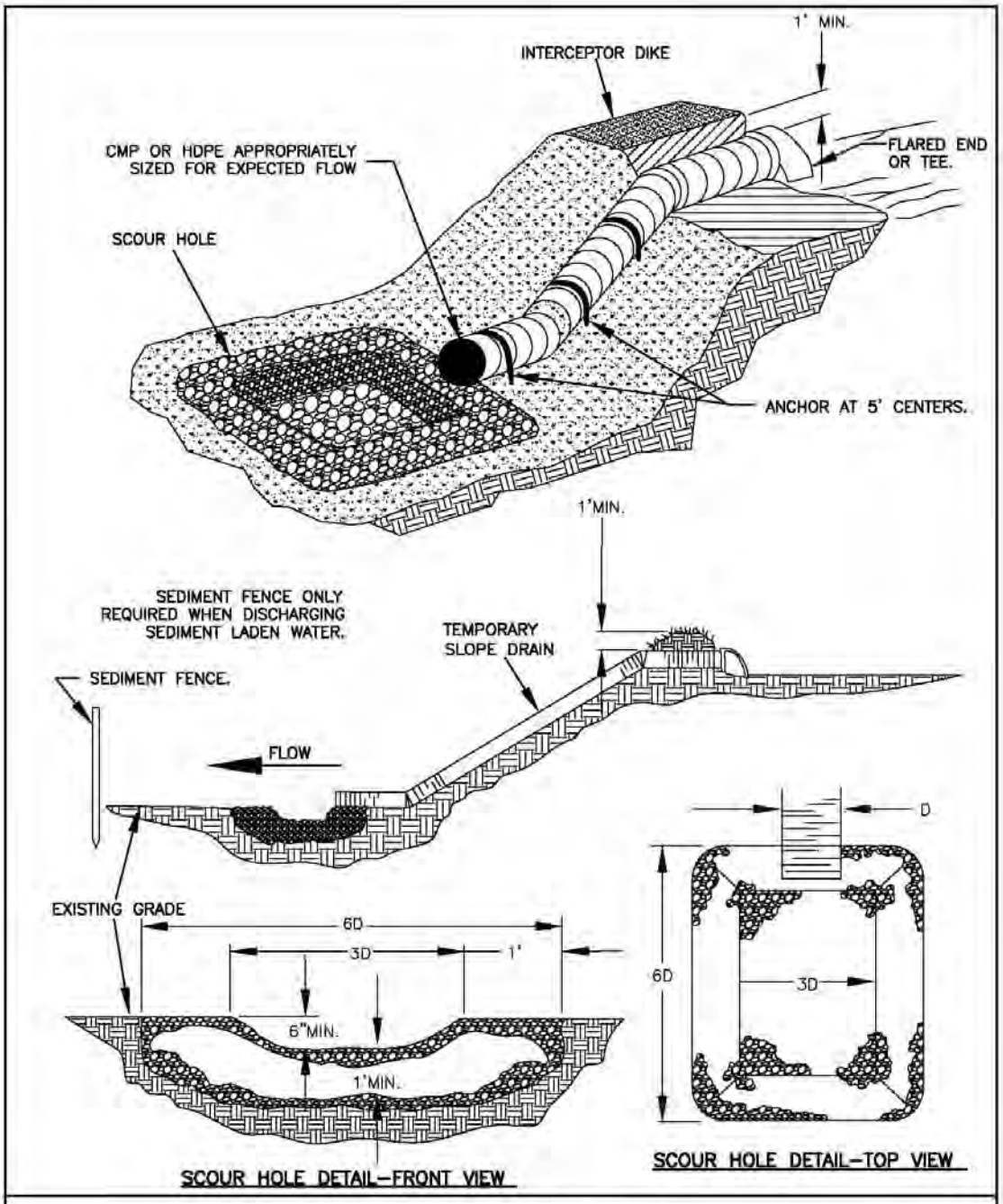
- Consider using continuously fused, welded or flange-bolted mechanical joint systems with proper anchoring or HDPP (high-density polyethylene pipe) for outfalls on steep slopes.
- Show the entrance sloped toward the pipe inlet.
- At the inlet, show interceptor dikes that are at least 12 in. higher at all points than the top of the inlet pipe and placed to direct water into the pipe.
- If the pipe slope drain will convey sediment-laden runoff, direct the runoff to a sediment retention facility.
- If the runoff is not from a disturbed area or is conveyed from a sediment trap or pond, convey the runoff to a stabilized discharge point.
- Energy Dissipation – Scour holes or riprap-lined stilling basins prevent most scour problems at outfalls.
- Consider site conditions to determine if a more complex energy dissipater may be required.

- The special provisions and typical notes should include the following installation directions:
  - Minimize disturbance during installation. In some circumstances this requires HDPP installed by hand.
  - Slope anchor details.
  - Immediately stabilize any area disturbed during installation or maintenance.
  - Securely connect the standard flared end section at the entrance to the slope drain, using watertight connecting bands.
- Pipe should be staked securely to prevent movement
  - Securely fasten together the slope drain sections with gasketed watertight fittings, and securely anchor the sections into the soil.
  - Stabilize the area below the outlet following the energy dissipater.

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Adjust lengths of pipe when cut and fill slopes are extended.
- Regularly check the inlet and outlet points, especially following heavy rains. If there are signs of undercutting or water is going around the point of entry, reinforce the head wall with compacted earth or sand bags.
- Regularly check at connection points for signs of erosion. Tighten fittings and repair erosion as needed.
- Immediately repair and install appropriate protection if erosion occurs at the outlet.


1' MIN.
INTERCEPTOR DIKE
CMP OR HDPE APPROPRIATELY SIZED FOR EXPECTED FLOW
FLARED END OR TEE.
SCOUR HOLE
ANCHOR AT 5' CENTERS.
1'MIN.
SEDIMENT FENCE ONLY REQUIRED WHEN DISCHARGING SEDIMENT LADEN WATER.
TEMPORARY SLOPE DRAIN
SEDIMENT FENCE.
FLOW
EXISTING GRADE
6D
3D
1'
6"MIN.
1'MIN.
SCOUR HOLE DETAIL-FRONT VIEW
D
6D
3D
SCOUR HOLE DETAIL-TOP VIEW
PIPE SLOPE DRAIN
DETAIL DRAWING 4-9
REVISED 01-09

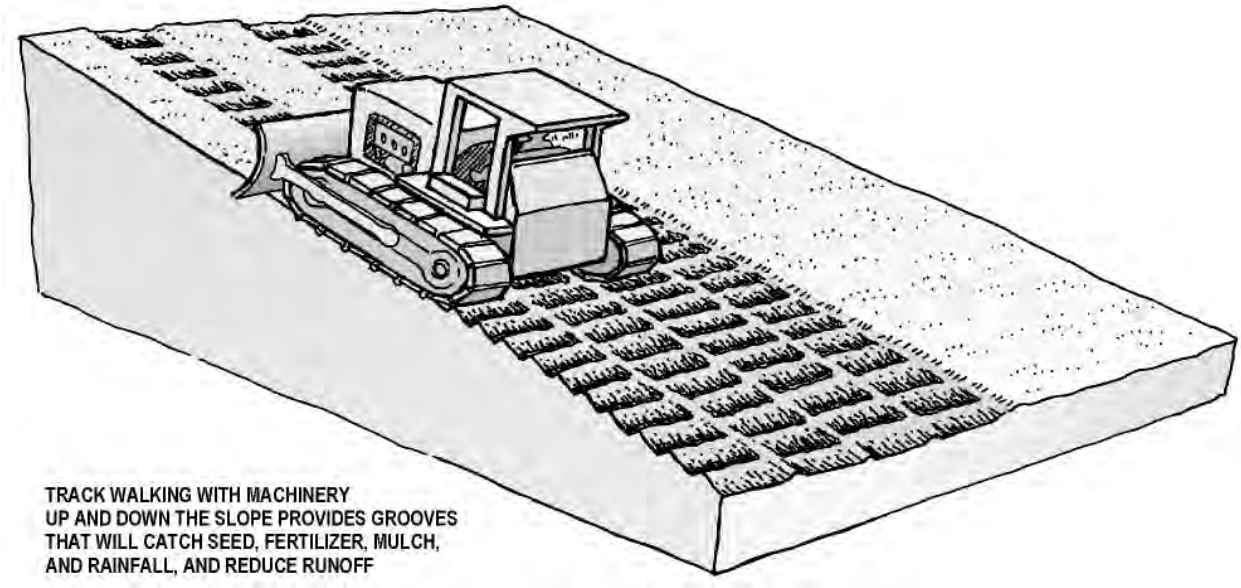
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SURFACE ROUGHENING





4.2.6 Surface Roughening



Leaving the slopes in a roughened condition after clearing or creating a rough soil surface with horizontal depressions or grooves will trap seed and reduce runoff velocity. Roughening can be accomplished by 'track walking' slopes with tracked equipment, by using a serrated wing blade attached to the side of a bulldozer, or by other agricultural equipment.

Advantages

- Grooves trap seed.
- Increased vegetation establishment.
- Reduces runoff velocity, increases infiltration.
- Provides some instant protection from sheet erosion.
- Traps soil eroded from the slopes above.

Disadvantages

- Tracking with a bulldozer or other heavy equipment may compact the soil.
- May increase time to finish slopes.
- Should not be relied upon as sole means of erosion control.

Design Criteria

- All slopes to be seeded.
- On slopes 3:1 or less, but can be used on steeper slopes in conjunction with the addition of staging sediment barriers.

- Immediately seed and mulch roughened areas to obtain optimum seed germination and growth.
- Height of track grousers should be 1 ½ inches or greater.
- Tracking should be accomplished by driving equipment **up** and **down** slope to create horizontal depressions/grooves.

Cut Slope Roughening

- Stair-step grade or groove the cut slopes that are steeper than 3:1.
- Use stair-step grading on all erodible material soft enough to be ripped with a bulldozer. Slopes consisting of soft rock with the same subsoil are particularly suited to stair-step grading.
- Make the vertical cut distance less than the horizontal distance, and slightly slope the horizontal position of the "step" in toward the vertical wall.
- Do not make individual vertical cuts more than 2 feet high in soft materials or more than 3 feet in rocky materials.
- Groove the slope using machinery to create a series of ridges and depressions that run across the slope, on the contour.

Fill Slope Roughening

- Place fill slopes with a gradient steeper than 3:1 in lifts not to exceed ½ foot, and make sure each lift is properly compacted.
- Ensure that the face of the slope consists of loose, uncompacted fill 4-6 inches deep.
- Use horizontal grooving along the contour or tracking to roughen the face of the slopes, if necessary.
- Apply seed, fertilizer and straw mulch, and then track or punch the mulch with a bulldozer.
- Do not blade or scrape the final slope face.

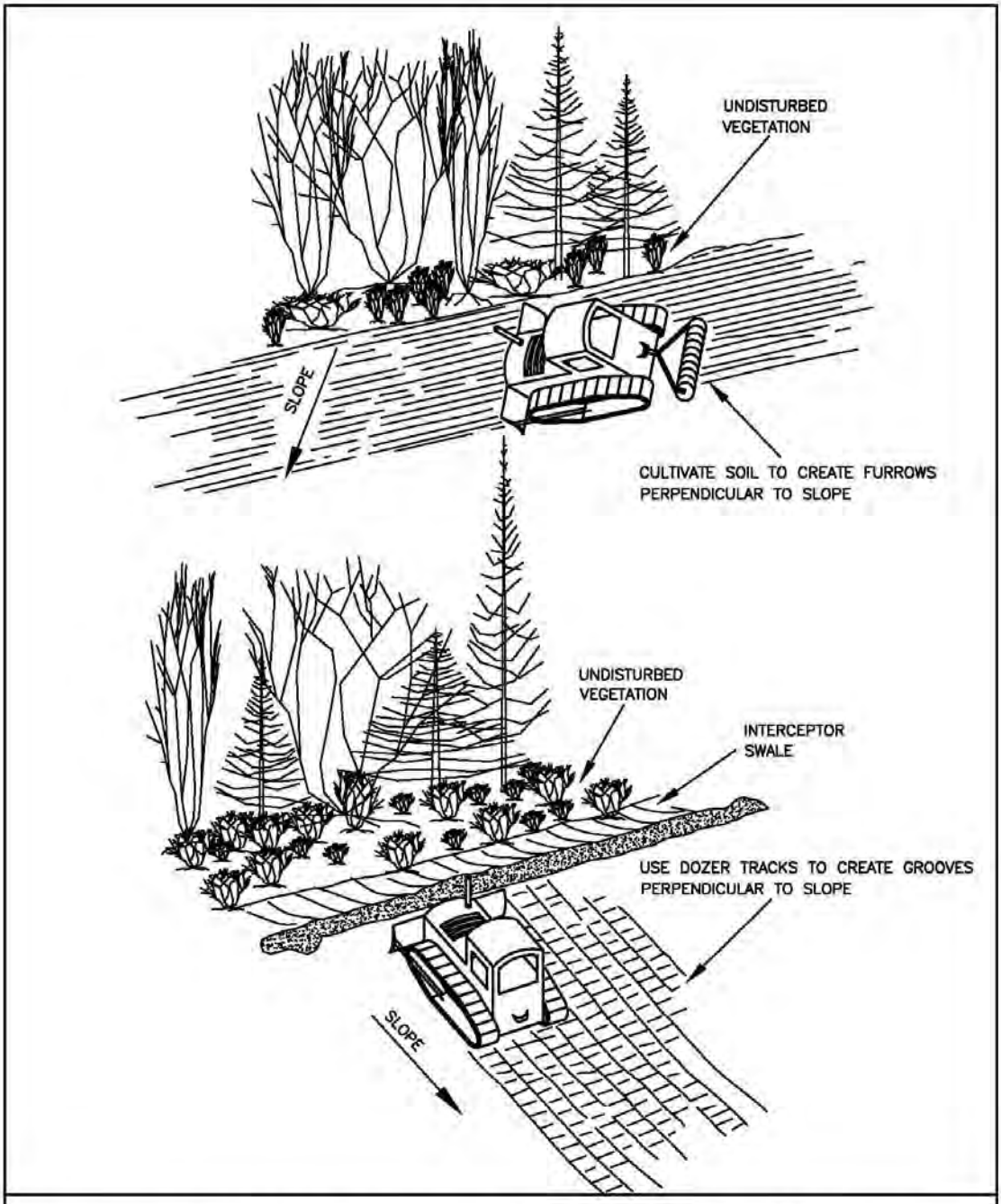
Cuts, Fills, and Graded Areas

- Make mowed slopes no steeper than 3:1.
- Roughen these areas to shallow grooves by normal tilling, disking, harrowing, or use a cultipaker-seeder. Make the final pass of any such tillage on the contour.
- Excessive roughness is undesirable where mowing is planned.

Inspection & Maintenance

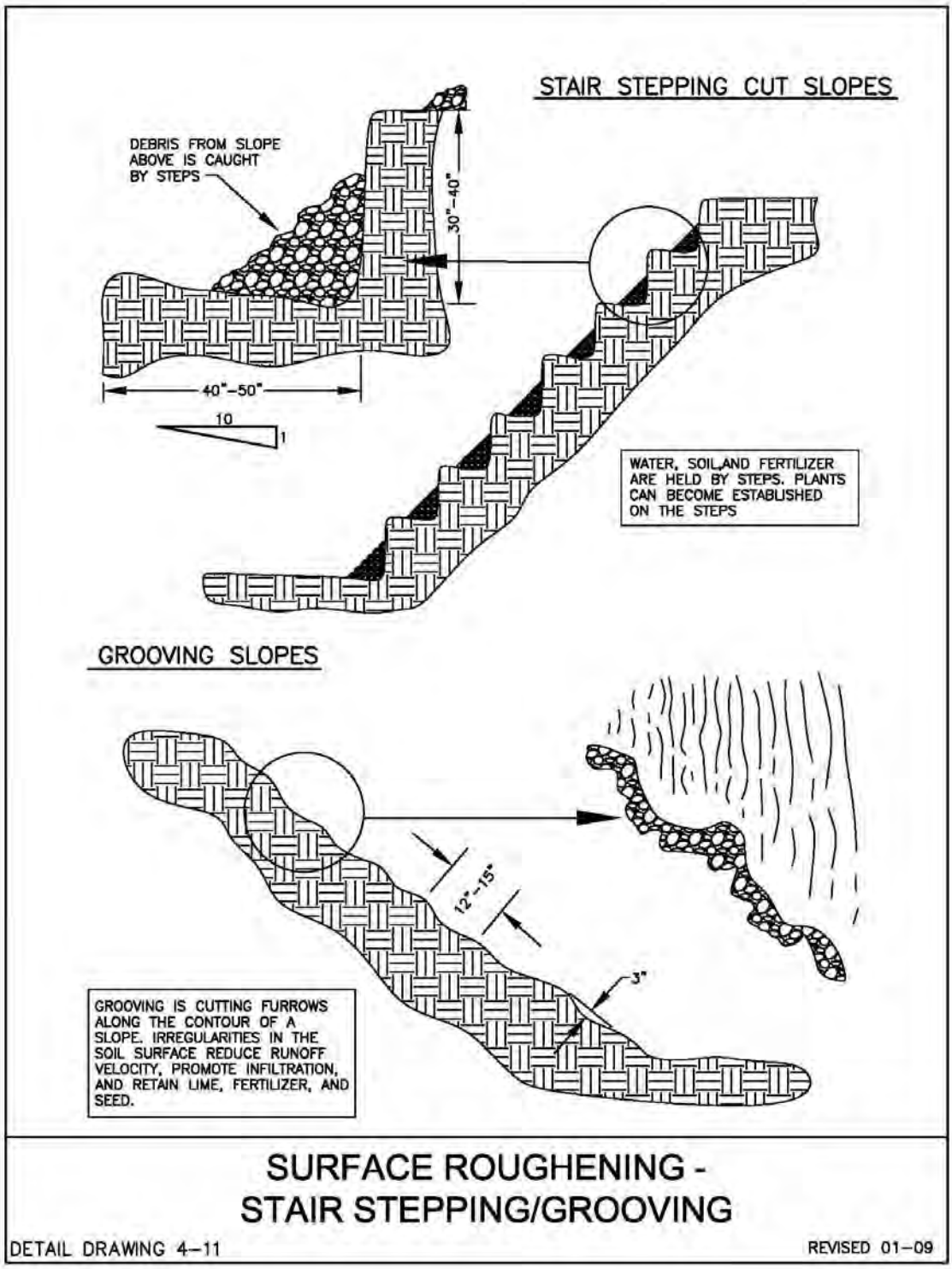
Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Check the seeded slopes for rills and washes. Fill these areas slightly above the original grade, then re-seed, mulch, or mat as soon as possible.



SURFACE ROUGHENING - CAT TRACKING

DETAIL DRAWING 4–10 REVISED 01–09



SURFACE ROUGHENING - STAIR STEPPING/GROOVING

DETAIL DRAWING 4-11 REVISED 01-09

4.3 Sediment Control Practices

Once soil erosion occurs, sediment trapping or removal techniques can reduce the amount of sediment and associated pollutants that leave the site, thus protecting nearby streams, wetlands, and lakes. Sediment controls are usually placed around the perimeter of a disturbed area and where concentrated water leaves the site. Sediment control BMP's should be in place before land clearing and grading begins. It is important to note that sediment controls, if poorly maintained, can become sources of sediment and other pollutants during larger storms.

1. Bio-filter Bags
2. Construction Entrance
3. Dewatering
4. Filter Berm
5. Inlet Protection
6. Oak Mats
7. Pre-Fabricated Barriers
8. Sand Bags
9. Sediment Basin
10. Sediment Fence
11. Sediment Trap
12. Sidewalk Subgrade Gravel Barrier
13. Tire Wash
14. Wattles

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BIO-FILTER BAGS



4.3.1 Bio-filter Bags

Biofilter bags are manufactured from 100% recycled wood-product waste placed in plastic mesh bags.

Advantages

- Relatively low cost.
- Can be used in place of sediment fences at toe of slope, without trenching in.
- Wood-product can be recycled or used on site when no longer needed.
- Installation is simple, can be done by hand.
- Bags are easy to move, replace and reuse on paved surfaces.
- Are good short-term solution in situations where concentrated flows are causing erosion.

Disadvantages

- Generally effective for only a few months.
- Can be easily damaged by construction equipment or by traffic in paved areas.
- Can become clogged with sediment and cease to filter runoff.
- If improperly installed can allow undercutting or end-flow.
- Not effective where water velocities or volumes are high.
- Light weight results in higher buoyancy if not properly installed.
- Low sediment retention capacity may require frequent maintenance.

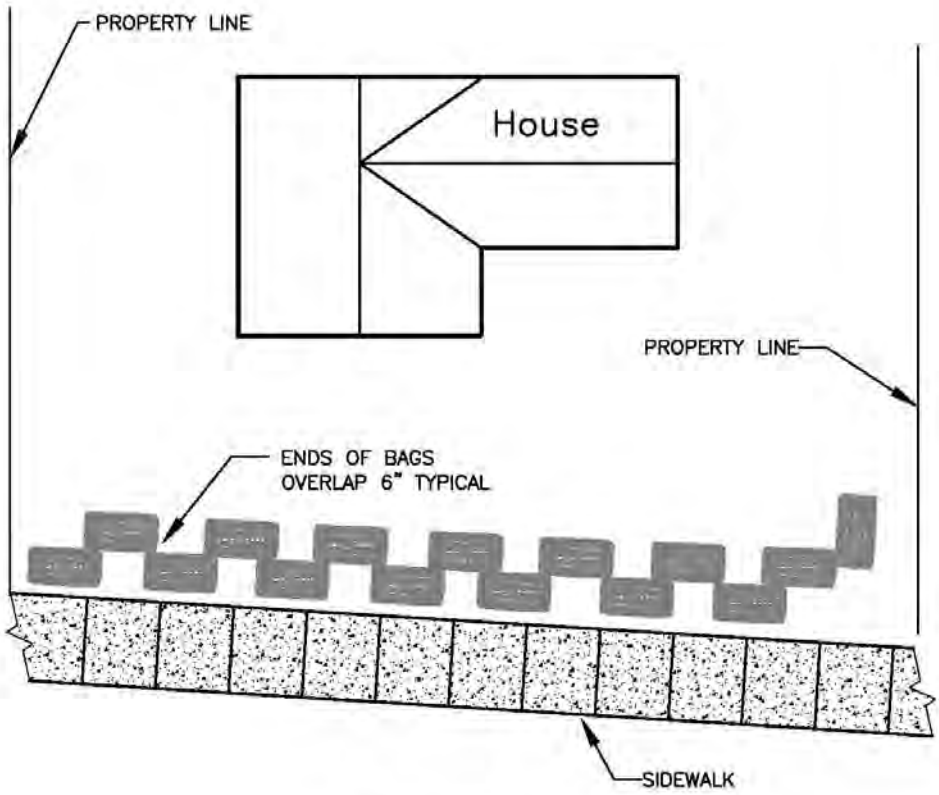
Design Criteria

- Bio-filter bags should be clean 100 percent recycled wood product waste. Standard size 10x8x30 inches, weight approximately 45 pounds, with ½ inch plastic netting
- May be left in place or used as mulch once they have served their purpose.
- Surface area should be smooth
- Use (2) 1x2 inch stakes per bag, driven 12 inches into ground.
- Ends of bags must be overlapped 6 inches to prevent piping between joints.

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Check that stakes are secure and ends of bags are tightly overlapped. Check that undercutting or end-flow is not occurring.
- Inspect plastic mesh bags for tears.
- Remove sediment when 1/3 height of bag has accumulated.
- Replace damaged bags as needed.



PLAN VIEW
NTS

NOTE:
1. STAKING OF BAGS REQUIRED USING (2) 1"x2" WOOD STAKES OR APPROVED EQUAL PER BAG.
2. BAGS ARE USED AS ALTERNATE FOR SEDIMENT FENCE FOLLOWING INSTALLATION OF SIDEWALK ON SINGLE FAMILY CONSTRUCTION ONLY.

BIO-FILTER BAGS

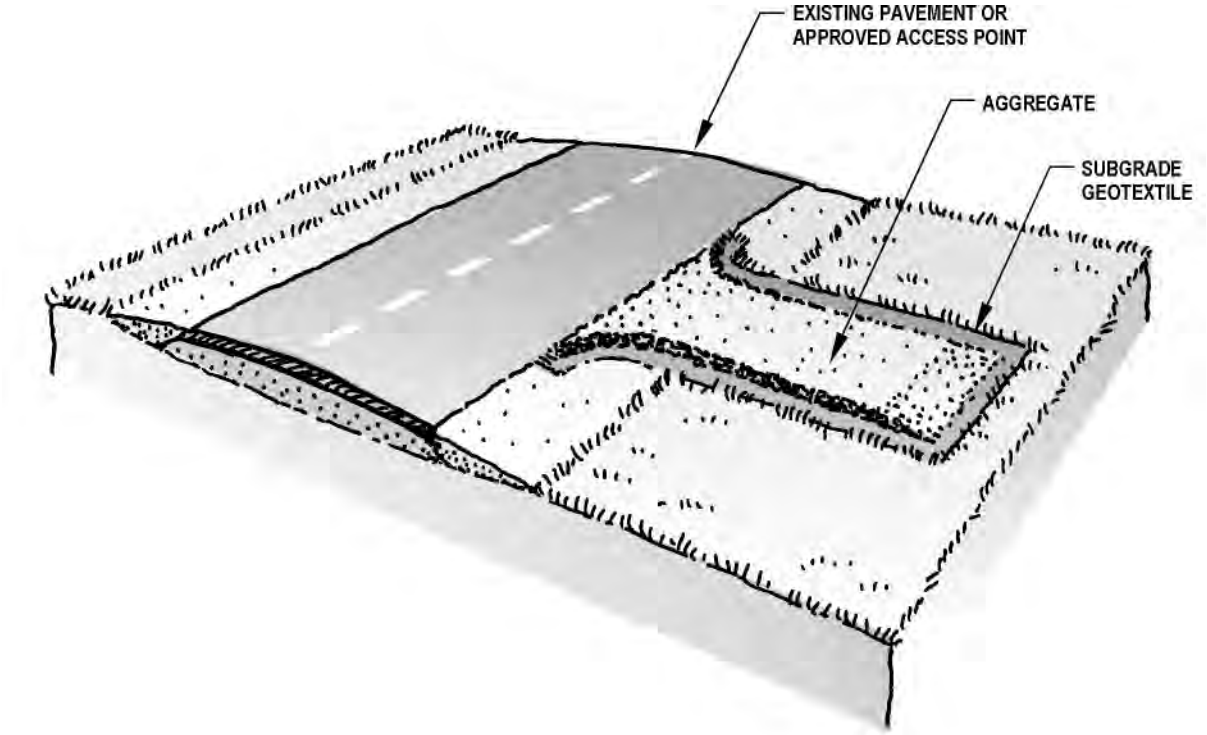
DETAIL DRAWING 4–12 REVISED 01–09

CONSTRUCTION ENTRANCE





4.2.2 Construction Entrance



A stabilized rock pad, placed at construction site ingress/egress locations, that reduces the amount of sediment transported onto paved roads by vehicles or runoff. The Construction Entrance also includes a curb ramp designed out of wood.

Advantages

- Reduces traffic hazards caused by debris on public roadways.
- Reduces sediment and other debris from entering roadways, which can then be washed into the storm system.

Disadvantages

- Only effective if erosion and sediment control employed elsewhere onsite.
- Only works if installed at every location where significant construction traffic leaves the site.
- Fills with sediment quickly and requires frequent maintenance and/or replacement of rock.

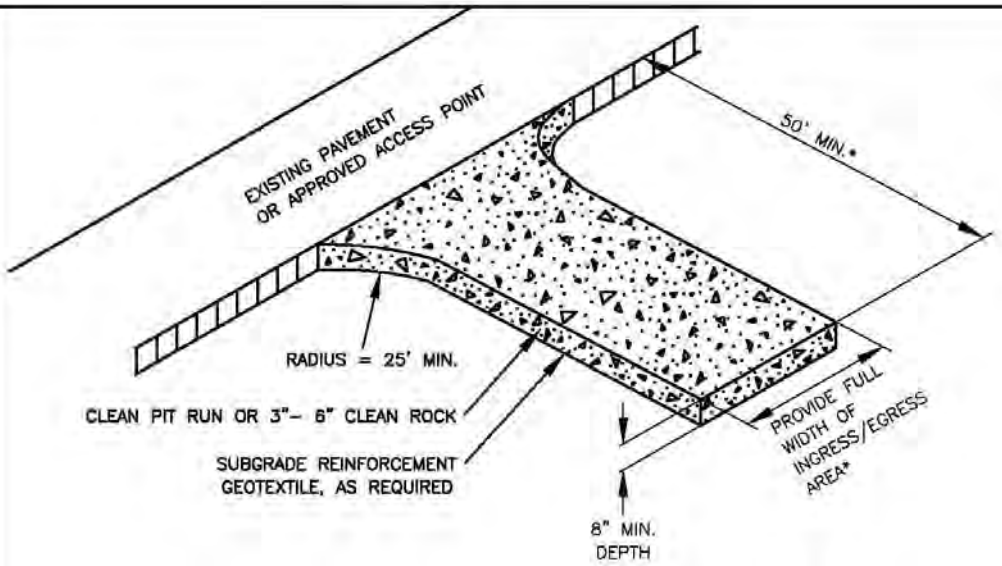
Design Criteria

- Install construction entrance prior to any site work.
- Whenever possible, construct the pad on a firm, compacted subgrade.

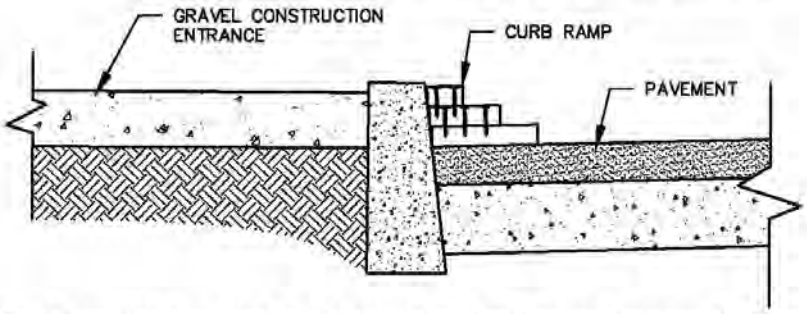
- Install geotextile under rock when subgrade is not stable or is "pumping" up into the pad.
- **Minimum length:**
  - 20 ft - all single family sites.
  - 50 ft – all other development sites.
- **Minimum width:**
  - 20 ft - all construction sites.
- **Minimum Depth:**
  - 8 in. - all construction sites.
- **Rock Size:**
  - ¾ x 0 - all single family sites
  - 3-6 in. – all other construction sites
- Do not install rock on paved surfaces. (Use wood curb ramps.)
- Wood Curb ramps should be made out of 2x6 material, nailed together.
- Include a tire wash facility if the entrance does not prove effective in retaining sediment onsite.

Inspection & Maintenance

- Requires ongoing inspection
- Immediately sweep up and remove or stabilize onsite any sediment that is tracked onto pavement.
- If the sediment poses a threat to public safety and street sweeping proves ineffective, consider washing the street and collecting the water in a sediment pond or sump before it leaves the site.
- Add or replace rock as needed to maintain the specified dimensions.
- Immediately remove any rock, which gets carried from the pad to the roadway.



*20' MIN. FOR SINGLE FAMILY AND DUPLEX RESIDENTIAL



NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT–OF–WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF– WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.
5. DIMENSIONS
   - SINGLE FAMILY
     20' LONG BY 20' WIDE 8" DEEP OF ¾" MINUS CLEAN ROCK.
   - COMMERCIAL
     50' LONG BY 20' WIDE 3–6" CLEAN ROCK, GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB–SOIL PUMPING.

CONSTRUCTION ENTRANCE

DETAIL DRAWING 4–13 REVISED 01–09

DEWATERING





4.3.3 Dewatering

Filtration is the separation of sediment from a fluid by passing the fluid through a permeable medium that will trap a high percentage of the particles. This is not a new concept; it has been employed in all types of industries, for various type of liquids, including water. The equipment necessary for filtration applications associated with water containing sediment would be weir tanks, gravity boxes, non-contained sediment bags, sand media filtration, and bag/cartridge chambers. There are two types of filtration systems, gravity and pressure.

Advantages

- Excellent for utility work such as repairs, replacements, or new installations.
- Depending upon the choice of filtration systems, can remove small particles of silt and clays.
- Can be used as an alternate to sediment trap/basin on smaller sites
- Can hold large amounts of sediment which reduces overall maintenance.
- Can be used in conjunction with other types of filters as a pre-filter.
- Can be easily mobilized from site to site.

Disadvantage

- Limited storage capacity depending upon the site.
- Have limitations in removing silts and clays, depending upon selection.
- May require heavy equipment to load and unload system.
- May be cost inhibitive.

Design Criteria

- Determine soil type prior to selecting type of Dewatering system.
- Select an appropriate location that will reduce overall impacts.
- Weir tanks, Filter Boxes are effective for removal of large particles such as sand
- Sand Media Filters effective for removal of smaller particles such as sand and silt.
- Filter bags can remove large particles until fabric pores start to fill in or cake over then filter capacity increases to smaller sand and silt.
- Filter bags should be placed in a heavily vegetated area to increase there efficiency.
- Cartridge Filter Units will remove smaller particles such as silt and clay
- Rock Berms, Bio-filter Bags, or Sediment Fence shaped in a half circle and stages in a series of three can be installed as an alternate, or in conjunction with other systems.

Inspection & Maintenance

- Ongoing inspection is necessary in order to detect any malfunctions or operation of equipment.
- Periodic inspection of discharge areas.
- Remove sediment when it reaches 1/3 capacity of a sediment barrier.
- Material must be placed in an approved location on site or exported from site.

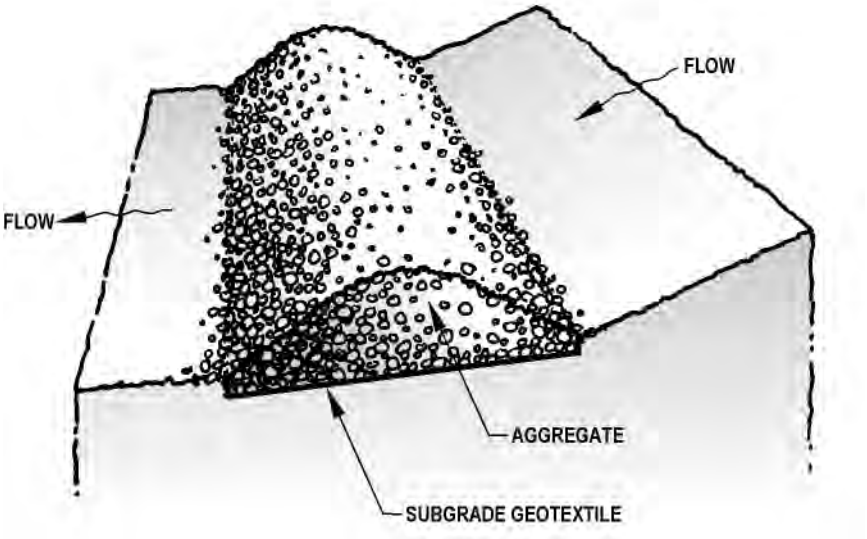
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FILTER BERM





4.3.4 Filter Berm



AGGREGATE BERM - Retains sediment in gravel or crushed rock berm.

Advantages

- Very efficient method for sediment removal.
- Reduces runoff velocity.

Disadvantages

- More expensive than some other measures because requires clean gravel or crushed rock rather than materials found onsite.
- Clogging from mud and soil may make maintenance difficult.
- Has a limited life span.

Design Criteria

- Use 2 in. maximum washed and well-graded gravel or crushed rock with less than 5% fines.
- Berm Dimensions:
  - Height and side slopes: 1 foot high with 3:1 side slopes.
  - Length: 8 foot per 1 cubic foot per second flow, based on the peak flow for the 10-year storm.
  - If used as slope application, use Table 4-9 for spacing.
  - Used primarily as a base measure (toe of slope)

COMPOST BERM - Can be used in place of sediment fence, straw wattles, etc. (For sheet flow only.)

Advantages

- Very efficient method for sediment removal.
- Reduces runoff velocity.
- Compost retains a large volume of water
- The mix of particle sizes in the compost filter material retains as much or more sediment than traditional perimeter controls, such as sediment fences, while allowing a larger volume of clear water to pass through the berm.
- Low removal cost as compost berm can be spread/tilled into surface as a soil amendment when no longer needed or can be seeded and left in place.

Disadvantages

- Initial cost may be higher than some other more commonly used measures.
- Clogging from mud and soil may make maintenance difficult.
- Has a limited life span.

Design Criteria

- Use mature, good quality material with sufficient particle size distribution. .
- Berm Dimensions:
  - Height and side slopes: 1 -1.5 feet high and 2-3 ft width at base.
  - If used as slope application, use Table 4-8 for spacing.
  - Used solely for sheet flow and installed along contours of slope

Table 4-8 Compost Berm Spacing and Minimum Dimensions

Slope	Slope Length	Min. Berm Dimensions (height x width)
<50:1	250 ft	1 ft x 2 ft
50:1 - 10:1	125 ft	1 ft x 2 ft
10:1 - 5:1	100 ft	1 ft x 2 ft
3:1 - 2:1	50 ft	1.3 ft x 2.6 ft
>2:1	25 ft	1.5 ft x 3 ft

Inspection & Maintenance

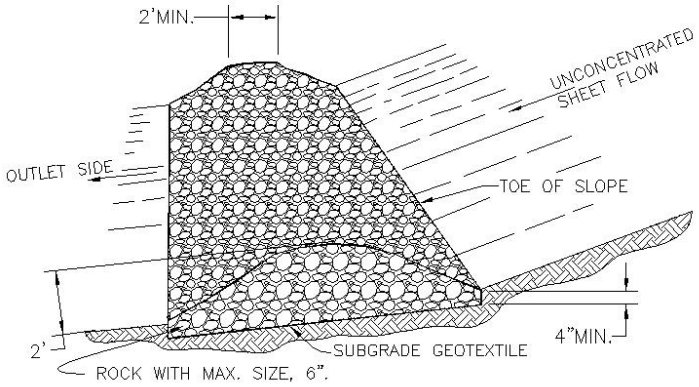
Site Condition	Minimum Frequency
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2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

Aggregate Berm

- Remove and replace rock when filtering capacity is reduced by half to maintain performance.
- Removed sediment accumulation when it reaches one-third of the barrier height.

Compost Berm

- Check for under-cutting or piping under berm.
- Inspect for channel formation parallel to the berm, which indicates it is acting as a flow barrier.
- Immediately repair any damage and install additional berms as needed.
- Removed sediment accumulation when it reaches one-third of the barrier height.



FILTER BERM

NOTES:
1. DIRECT THE OUTLET SIDE OF THE ROCK FILTER BERM/DAMS ONTO A STABILIZED AREA, SUCH AS VEGETATION AND OR ROCK.
2. EMBED A MIN. OF 4" INTO THE EXISTING GROUND/EMBANKMENT.
3. USE 3:1 OR FLATTER SIDE SLOPES. WITHIN THE SAFETY CLEAR ZONE. USE 6:1 OR FLATTER SIDE SLOPES.

ROCK FILTER BERM

Detail Drawing 4—14 REV. 2/19/09

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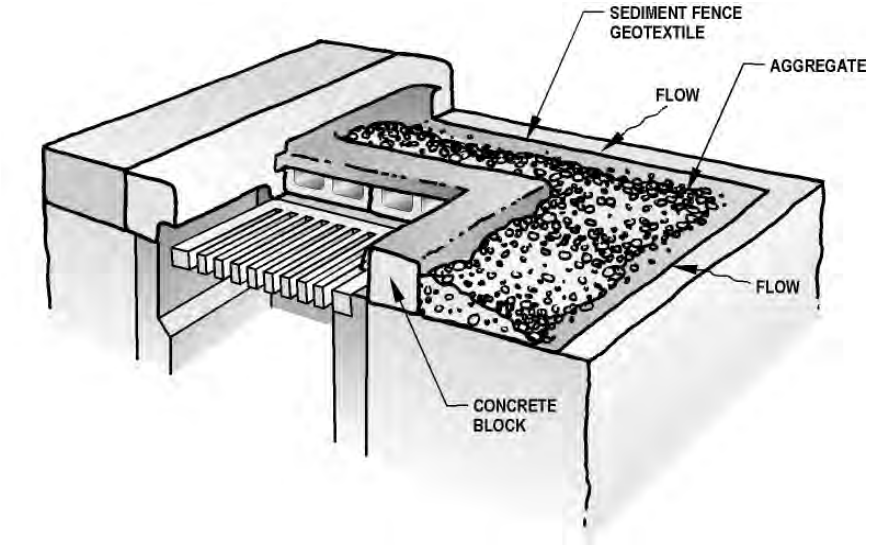
INLET PROTECTION



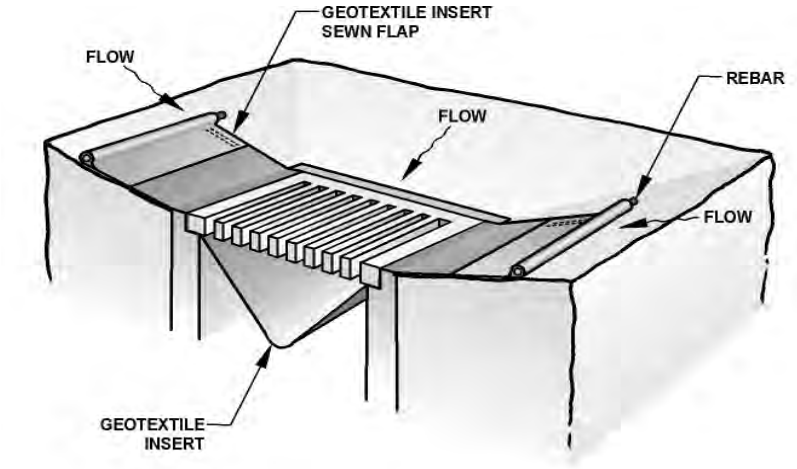


4.3.5 Inlet Protection

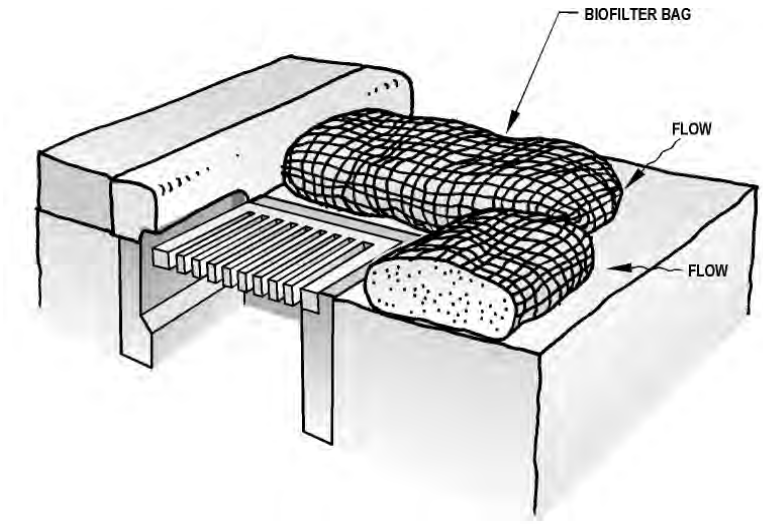
Prevents coarse sediment from entering storm drainage systems by filtering runoff and retaining sediment before it reaches a drainage inlet or storm sewer system. There are many options and variations of inlet protection available.



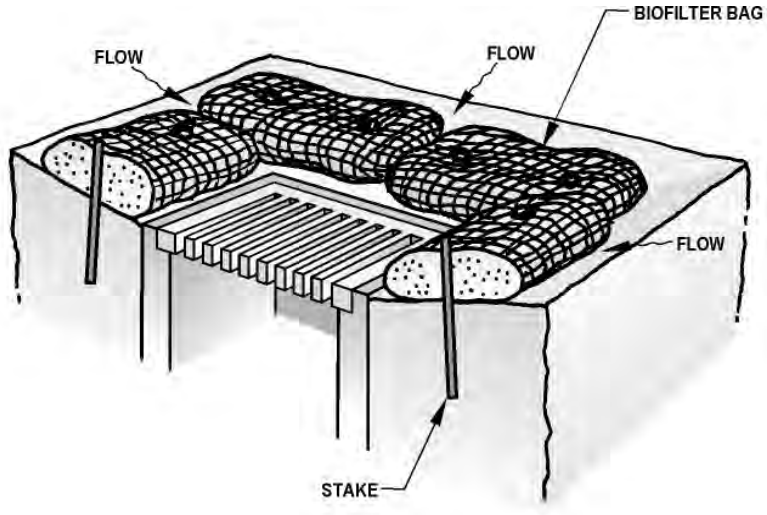
Inlet Protection – Masonry / Aggregate



Inlet Protection - Prefabricated Filter Insert



Inlet Protection – Biofilter Bags Around Catch Basin



Inlet Protection – Biofilter Bags Around Area Drain

Advantages

- Prevents sediment from entering the storm drain system.
- Reduces amount of sediment leaving the site.

Disadvantages

- May result in ponding of water above the catch basin.
- Sediment removal may be difficult under high-flow conditions.

- May result in a traffic hazard.
- Short-circuiting of flow may occur if not properly installed.
- Useful only for low flows having low sediment loading.
- Improper installation, maintenance or removal may introduce sediment into the storm drain system.

Design Criteria

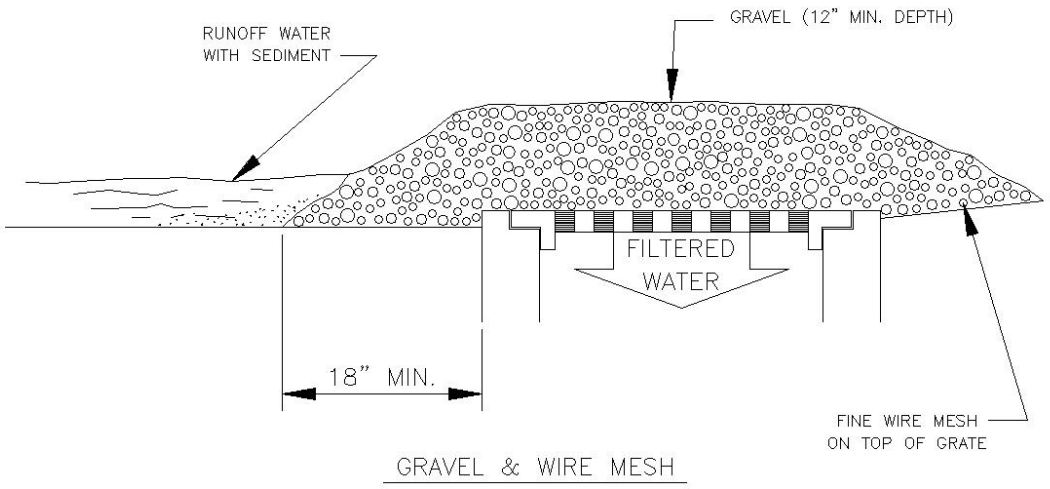
- Place inlet protection in areas where water can pond, and where ponding will not have adverse impacts.
- Inlet protection must allow for overflow in a severe storm event.
- Addition measures must be considered depending upon soil type
- Inlet protection types include:
  - Type 1 - Rock and wire mesh
  - Type 2 – Masonry and rock
  - Type 3 - Sediment fence
  - Type 4 - Biofilter bags
  - Type 5 - Catch basin insert
  - Type 6 – Bone bags

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Clean inlet protection during and after each significant storm and remove sediment from behind structure after every storm.
- If the rock becomes clogged with sediment, it must be carefully removed from the inlet and either cleaned or replaced.

- Assess the impacts of allowing water to pond at the inlet and provide an overflow weir or some other type of relief as needed.
- Use mechanical means to remove sediment deposits (shovel, broom, sweeper/vactor unit.
- Remove sediment accumulated on or around the protection as needed to maintain intended functions.
- Repair or replace materials as needed to ensure proper functioning.

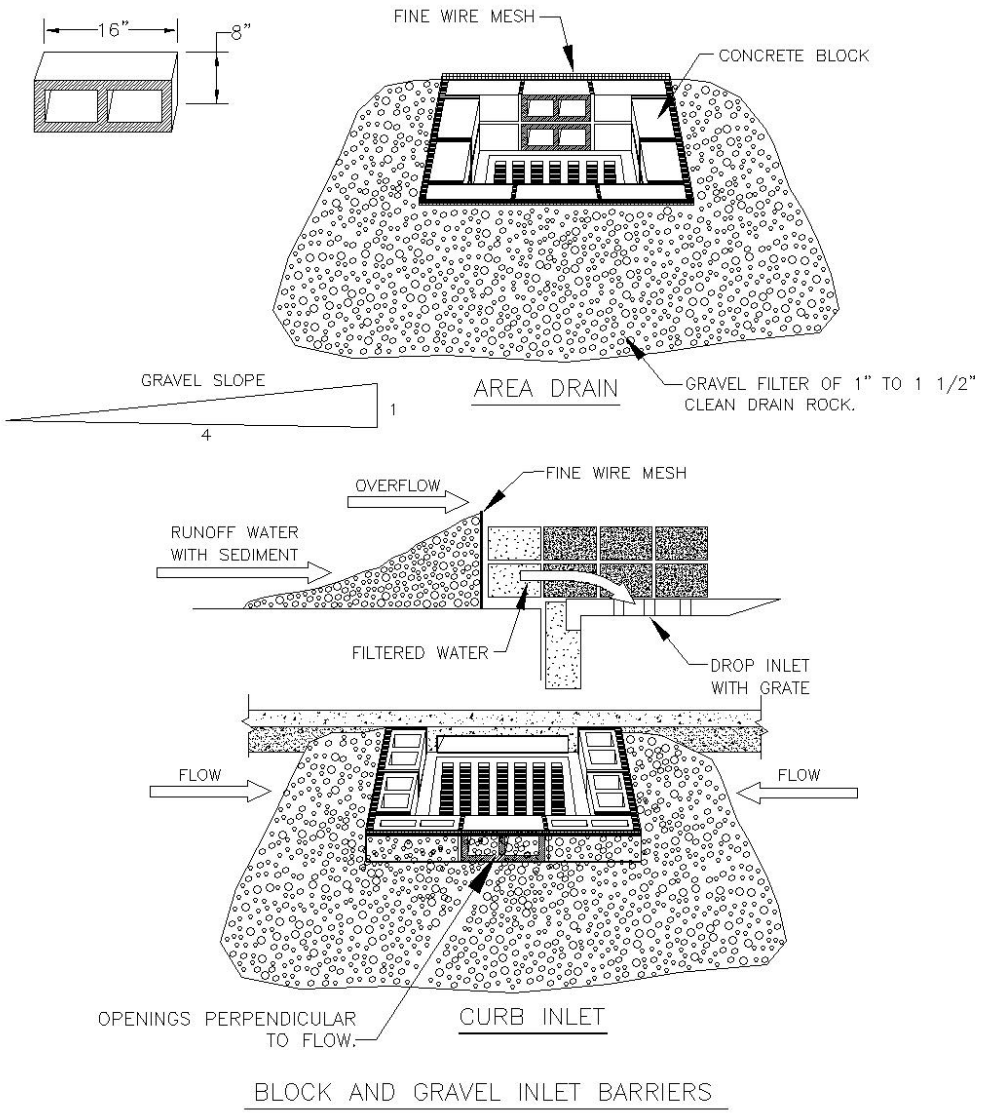


GRAVEL & WIRE MESH

INLET PROTECTION TYPE 1

DETAIL DRAWING 4–15

REVISED 01–09



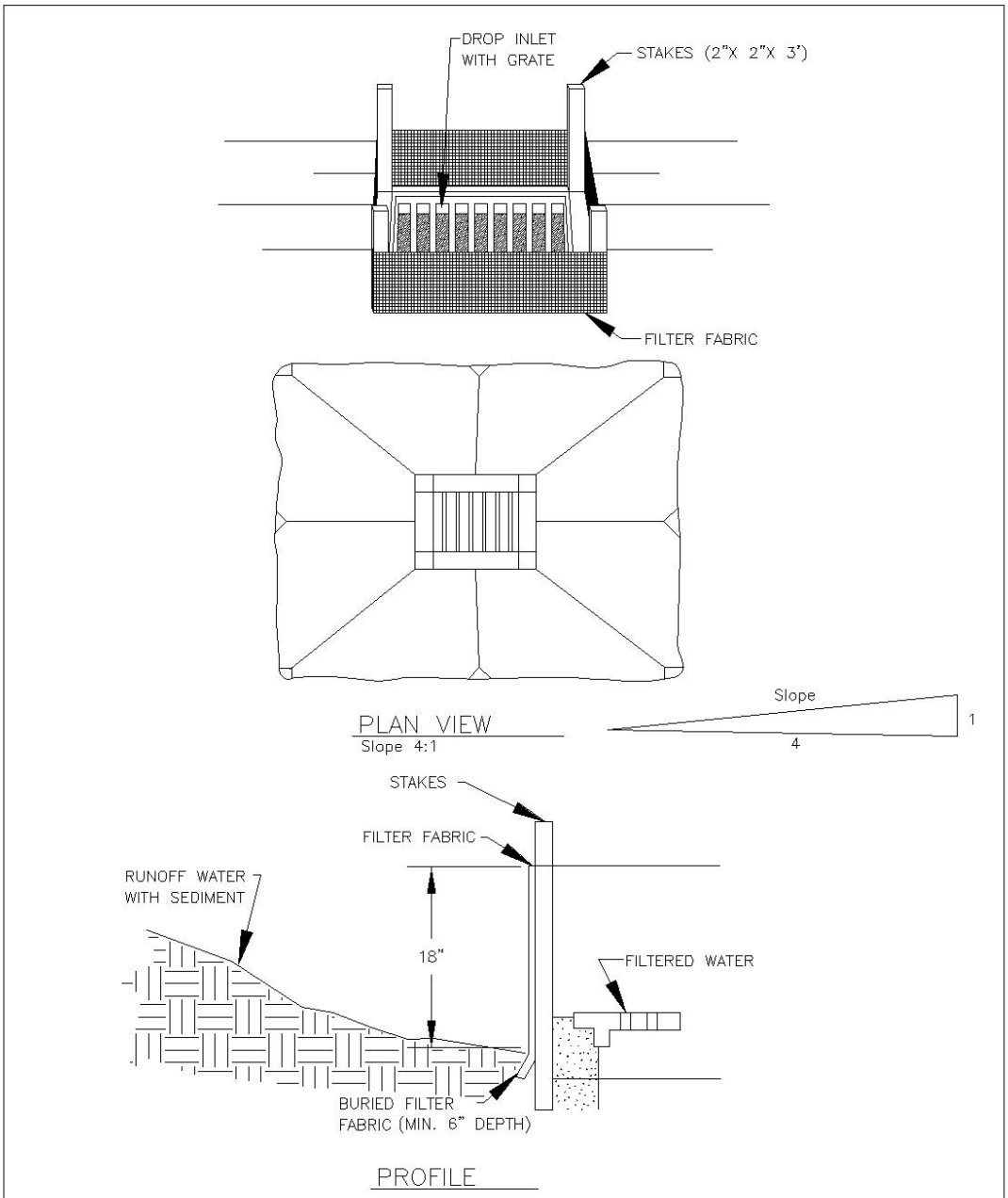
NOTE:

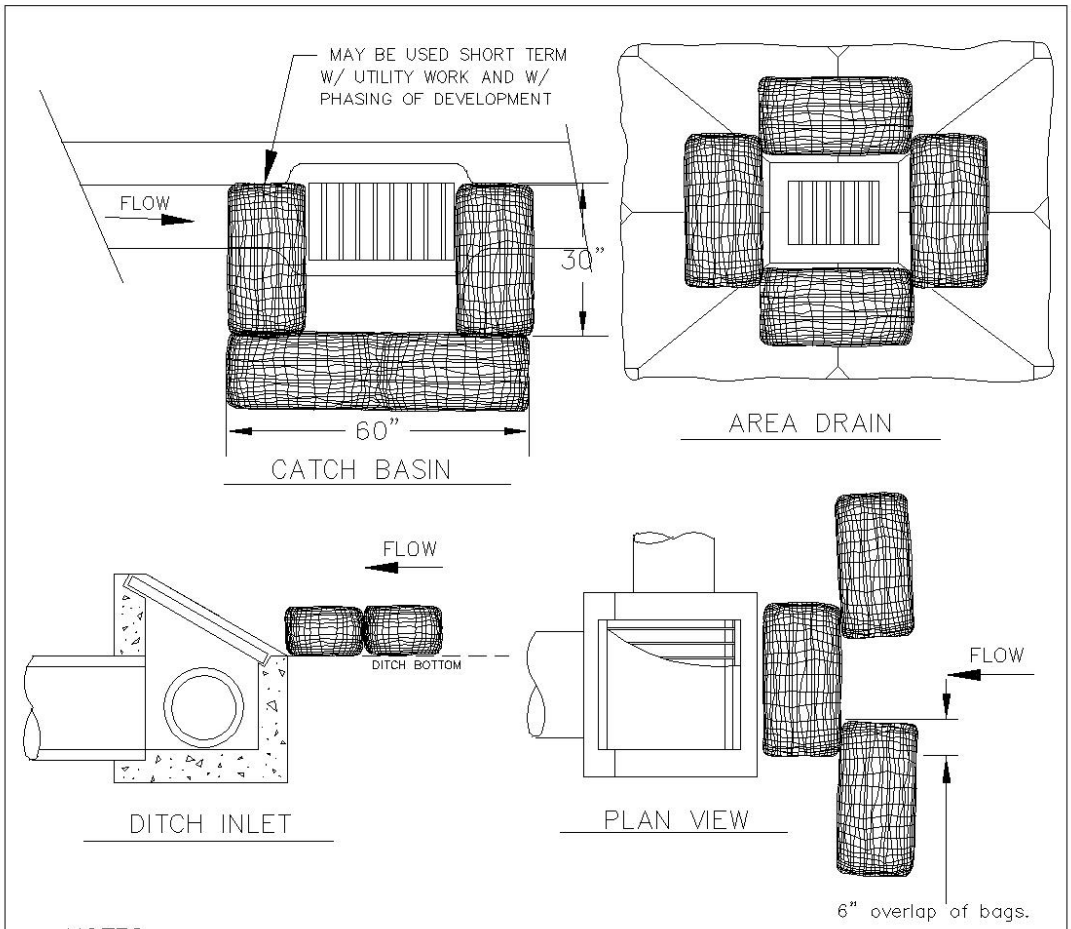
BLOCKS SHALL BE STACKED WITH THE OPENINGS ON THE TOP AND BOTTOM EXCEPT FOR THE CENTER CONCRETE BLOCKS WHICH WILL HAVE OPENINGS PERPENDICULAR TO FLOW.

INLET PROTECTION TYPE 2

DETAIL DRAWING 4–16

REVISED 01–09


DROP INLET
WITH GRATE
STAKES (2"X 2"X 3')
FILTER FABRIC
PLAN VIEW
Slope 4:1
Slope
1
4
STAKES
FILTER FABRIC
RUNOFF WATER
WITH SEDIMENT
18"
FILTERED WATER
BURIED FILTER
FABRIC (MIN. 6" DEPTH)
PROFILE
INLET PROTECTION TYPE 3
DETAIL DRAWING 4-17
REVISED 01-09



NOTES:

1. ADDITIONAL MEASURES MUST BE CONSIDERED DEPENDING ON SOIL TYPES.

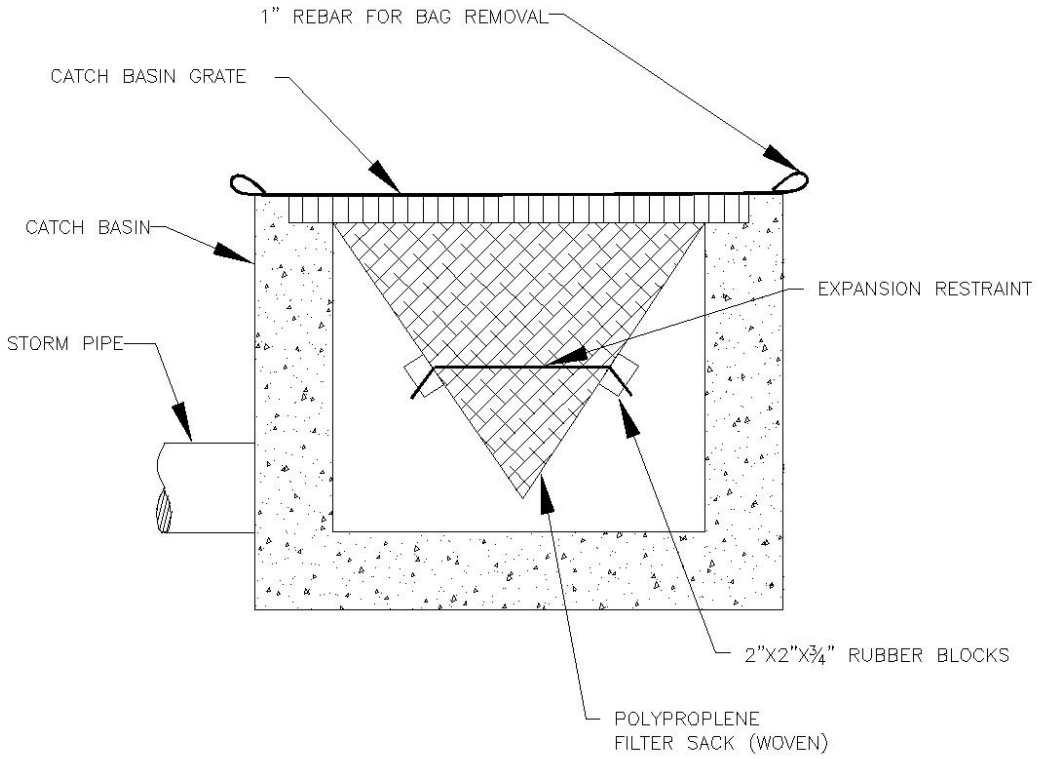
2. BIO–FILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1"x2"WOODEN STAKES OR APPROVED EQUAL PER BAG.

3. WHEN USING 30" BIO–BAGS TO PROTECT A CATCH BASIN YOU MUST HAVE 4 BAGS AND THEY SHALL BE OVERLAPPED BY 6".

INLET PROTECTION TYPE 4

DETAIL DRAWING 4–18

REVISED 01–09



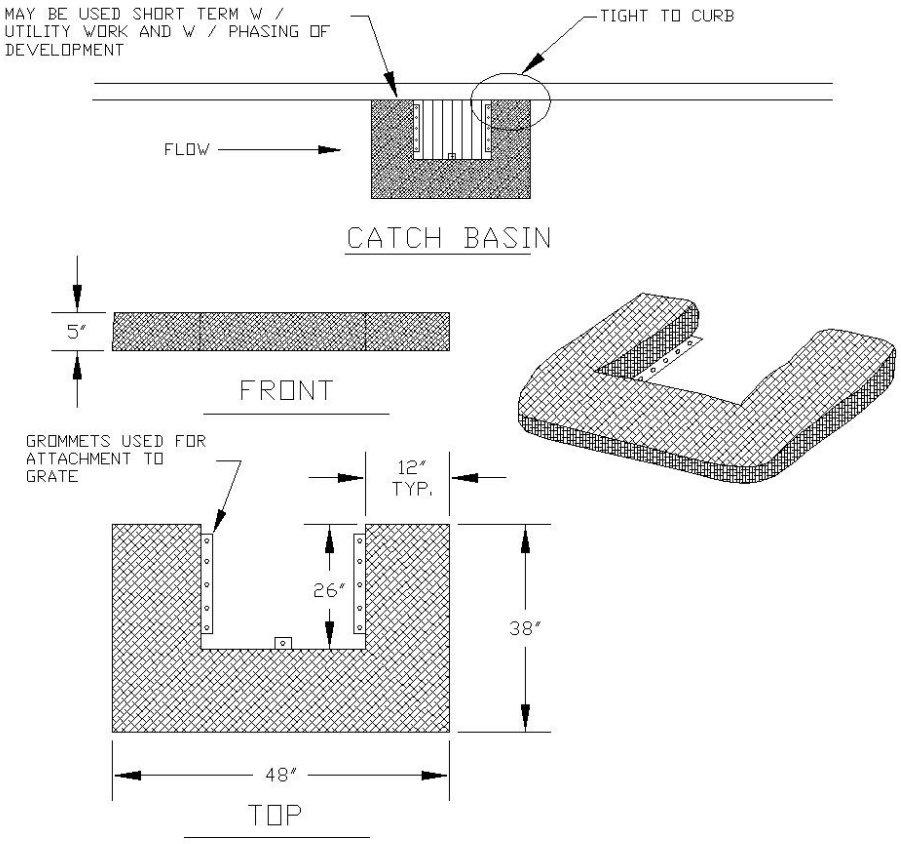
WOVEN POLYPROPLENE SACK

NOTE:

1. RECESSED CURB INLET CATCH BASINS MUST BE BLOCKED WHEN USING FILTER FABRIC INLET SACKS. SIZE OF FILTER FABRIC INLET SACKS TO BE DETERMINED BY MANUFACTURER.

INLET PROTECTION TYPE 5

DETAIL DRAWING 4–19 REVISED 01–09



INSTALLATION NOTES:
1. INSTALL SOLID FABRIC SIDE DOWN MESH SIDE UP.
2. ATTACH TO CATCH BASIN GRATE AT A MINIMUM OF 3 LOCATIONS TIGHT TO CURB WITH 1/4" ZIP TIES.

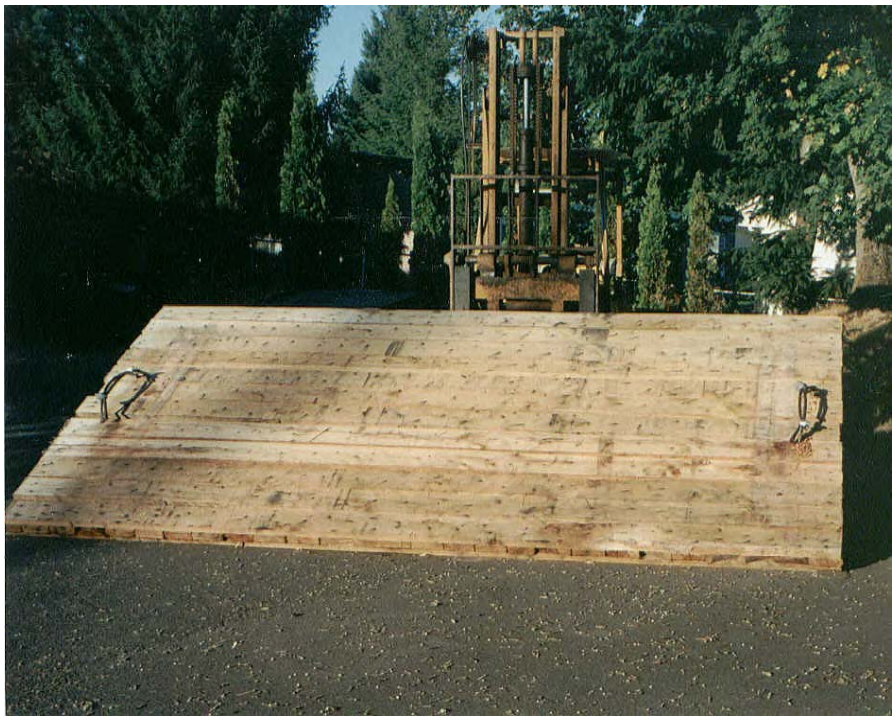
MAINTENANCE NOTES:
1. ANY VISIBLE SIGN OF SEDIMENT ACCUMULATION TO BE CLEANED UP AT THE END OF EACH WORKDAY.
2. REPLACE U - SHAPED FILTER BAG AS NECESSARY TO PREVENT WOOD CHIPS FROM ENTERING THE STORM SYSTEM.

INLET PROTECTION TYPE 6

DETAIL DRAWING 4-20 REVISED 01-09

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Oak Mats





4.2.6 Oak Mats

A stabilized platform, located at specified points of construction for the purpose of temporary or permanent ingress and egress. Oak Mats have two benefits: reduce overall tracking from construction sites, and creates a stable pad for heavy equipment, especially when working around sensitive areas such as wetlands and streams.

Advantages

- Provides a solid working platform
- Reduces tracking
- Significantly lighter then conventional steel sheets
- Can be used over several times
- Lifting cables for easy of loading and unloading
- Excellent alternative for linear projects

Disadvantages

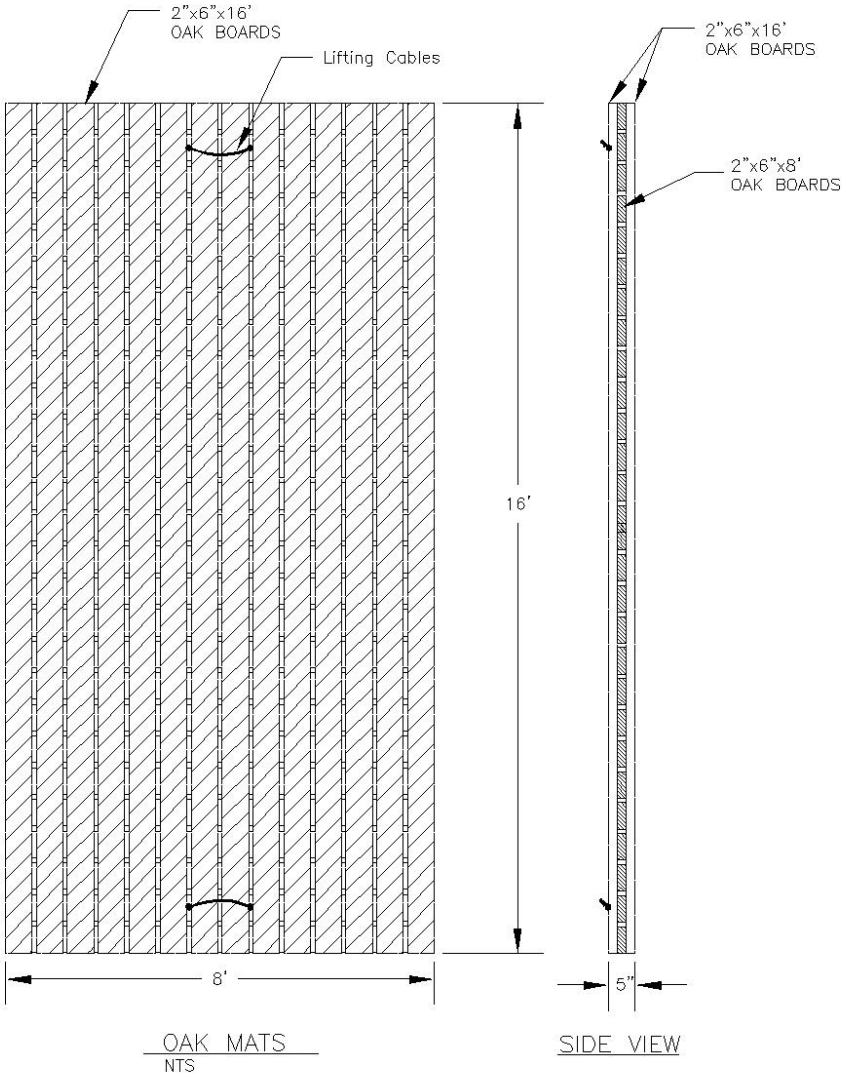
- Not suitable for all construction sites
- Depending upon the site, can be expensive
- Will deteriorate with age

Design Criteria

- Dimensions: 8'x16'x4 ½ " (3 Ply Laminated oak)
- Built-in lifting cables at each end
- Used for temporary or permanent access
- Built to withstand heavy equipment such as cranes, dump trucks, and back hoes
- On linear projects that parallel streams or wetlands install as a continuous working pad to reduce soil "pumping"
- Minor excavation of surface area may be required prior to installation of mats

Inspection & Maintenance

- Requires on-going inspection
- Remove any soil deposits from equipment and vehicles
- Immediately sweep up and remove any material that has be tracked onto public streets
- Remove and replace mats when they no longer stable or wood become broken or separated
- Check lifting cables to make certain they are in working order



NOTE:
1. CONSTRUCTED OF 2"x6" OAK.

OAK MATS

DETAIL DRAWING 4-21

REVISED 01-09

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PRE-FABRICATED BARRIER



4.3.7 Pre-Fabricated Barrier System

Pre-fabricated barrier systems typically consist of a triangular shaped dike, usually made of foam or other flexible, lightweight material. The dike is wrapped in geotextile, which extends from the bottom of the dike to provide aprons on the upslope and downslope sides of the dike. The dike is anchored by trenching and stapling the aprons. Barrier materials, section lengths and weights vary among manufacturers. Other pre-fabricated barriers consist of water filled hinged panels that act as a sediment basin or toe of slope base measure. Their purpose is to hold run-off for designed periods of time in order to allow for settling of soil.

Advantages

- Can be lightweight.
- Installation is relatively simple.
- Can be used to divert and slow velocity of small drainage areas.
- Reusable.
- Can retain larger suspended soils particles.

Disadvantages

- Can be easily damaged by construction equipment.
- Not effective in steep swales, channels or ditches.
- If improperly installed can allow undercutting or end-flow.
- Not effective where water velocities or volumes are high.
- Installation must be done exactly as specified by manufacturer.
- Not intended for use on steep slope applications.

Design Criteria

- Used primarily as a base measure.
- Install in accordance with plans, special provisions and manufacturer's recommendations.
- Specify drainage area.

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Check that undercutting or end-flow is not occurring.
- Check that barrier is not otherwise damaged.
- Check that aprons are securely anchored.
- Check that flow is not becoming channeled behind barrier (parallel to barrier)
- Remove sediment accumulation behind barrier when sediment reaches one-third the barrier height.
- Replace damaged sections as needed.

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SAND BAGS



4.3.8 Sand Bags

Sandbags are manufactured from durable, weather resistant tightly woven Geotextile fabric material sufficient to prohibit leakage of the filler material. The bags should measure 24 x 12 x 6 inches and be filled with firmly packed sand weighing at least 75 lbs.

Advantages

- Relatively low cost.
- Installation is simple, can be done by hand.
- Bags are easy to move, replace and reuse on paved surfaces.
- Are a good short-term solution in situations where concentrated flows are causing erosion.
- Can be used to divert and slow velocity of small flows.
- Can be used in concrete lined ditches capture sediment and reduce water velocity.

Disadvantages

- Generally effective for only a few months.
- Can be easily damaged by construction equipment or by traffic in paved areas.
- Can contribute sediment to runoff if bags rupture.
- Cannot be staked and are not appropriate on steep slope applications.
- Not effective in steep swales, channels or ditches.
- If improperly installed can allow undercutting or end-flow.
- Not effective where water velocities or volumes are high, can get washed away.

Design Criteria

- Generally used in ditches and/or swales as a check dam.
- Can be used on highway or road projects to divert run-off.
- Ends of bags must be tightly abutted and overlapped to direct flow away from bag joints.

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Check that ends of bags are tightly abutted. Check that undercutting or end-flow is not occurring.
- Remove sediment accumulated behind bags when sediment reaches one-third of the barrier height.
- Replace damaged bags as needed.

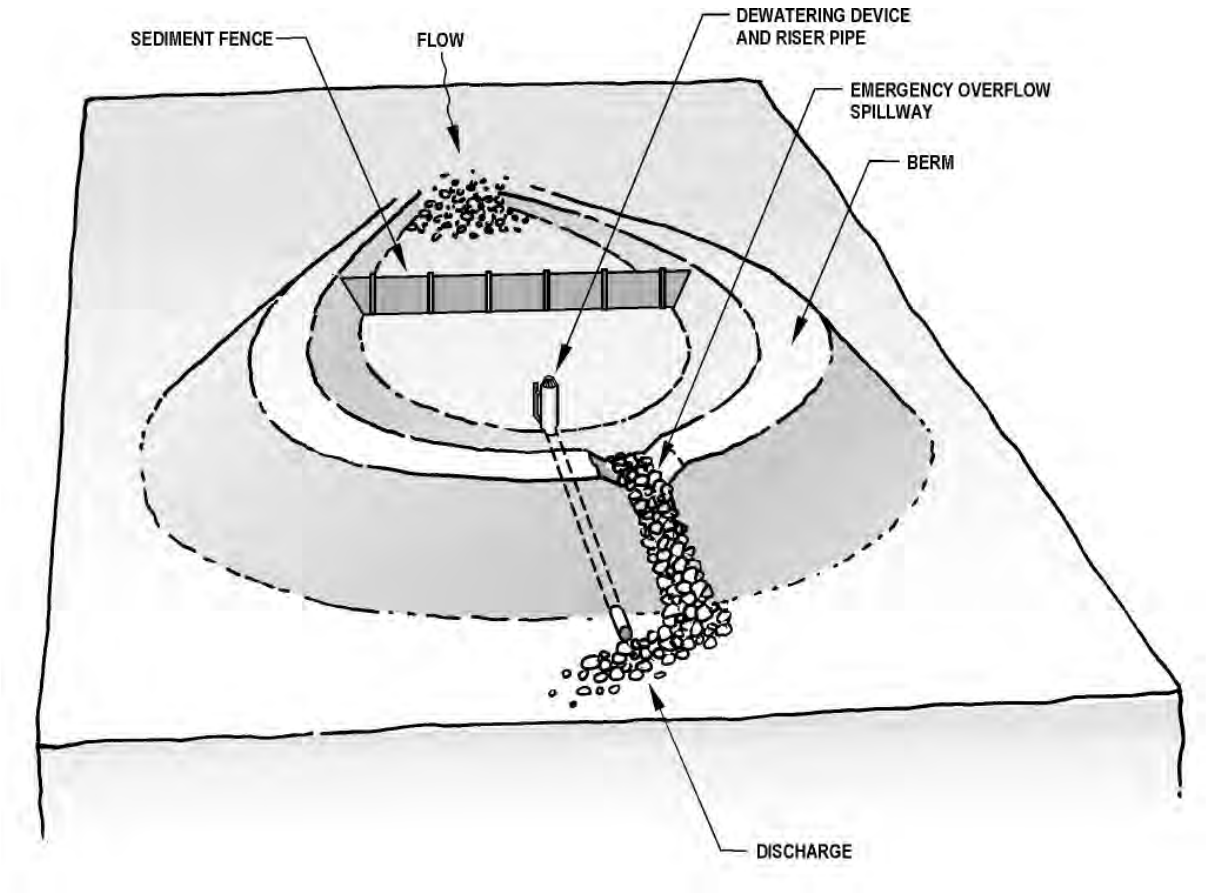
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SEDIMENT BASIN





4.3.9 Sediment Basin



A temporary sediment basin has one or more inflow points and baffles to spread the flow, wet storage and dry storage, a securely anchored riser pipe, a dewatering device and an emergency overflow spillway. The sediment basin serves drainage areas less than 10 acres and has a design life of approximately 1-year.

Basins are large facilities that treat runoff from large drainage areas. Because of this, basins have limited application on linear construction projects. The applications, advantages and disadvantages of basins are included here for the designer's edification.

Combining with Permanent Drainage Facilities

- If a project includes a permanent storm water retention/detention pond, the rough-graded or final-graded facility could function as a basin during construction. Design features of the permanent structure, such as surface area, retention time and outlet control, should meet the design requirements of the temporary facility.

Completion of the permanent facility should occur only when all upstream control structures are in place and stabilization of contributing drainage areas is complete.

- If a project includes an infiltration facility, the roughly excavated facility could be used as a basin, providing the facility provides the surface area and retention time required by the basin. Excavate the sides and bottom of the facility to a minimum of 2 foot above final grade with a backhoe working at "arms length" to minimize disturbance and compaction of the infiltration surface.
- Any required pretreatment facilities should be fully constructed prior to any release of sediment-laden water to the facility. Pretreatment and shallow excavations are intended to prevent the clogging of soil with fines.

Advantages

- Protect downstream riparian properties from sediment deposits.
- Prevent reduced downstream capacity due to sediment deposition in a stream channel.
- Prevents clogging of downstream facilities.
- Remove particles up to medium silt size 0.02 mm.
- Surface water conveyances can be connected to the facility as site development proceeds.

Disadvantages

- May become an attractive nuisance. Care must be taken to adhere to all safety practices.
- Failure of a basin which is not properly located could result in loss of life, damage to homes or buildings or interruption of services such as transportation or power.
- Maintenance and sediment removal is essential for adequate performance.
- Does not reduce turbidity resulting from fine silts and clays in runoff. Basins are more effective when used in conjunction with other measures such as seeding and mulching.

Design Criteria

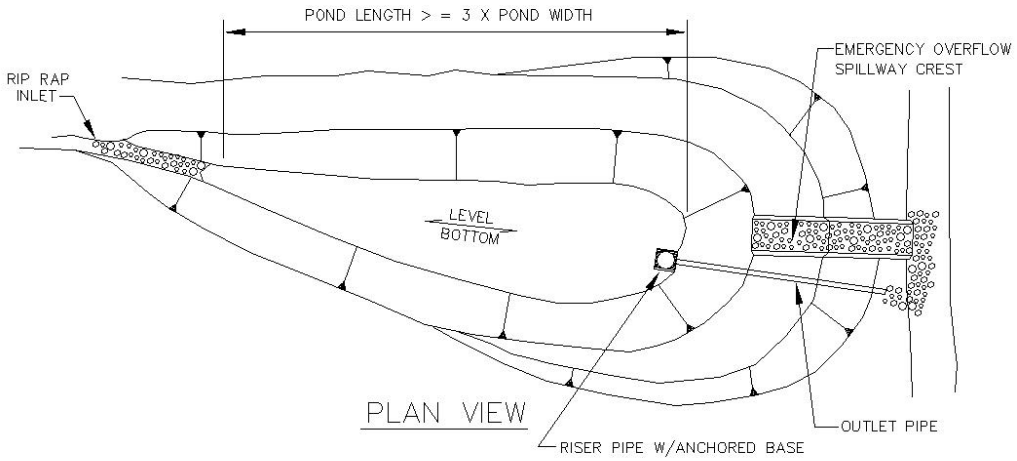
- Water temperature in the basin may be too high for direct release. Always moderate the water temperature before it drains into a lake, stream or waterway. Whenever possible, release the trap discharge onsite onto a relatively level, densely grassed area at least 50 feet from a waterway or wetland.
- Require installation of a staff gauge to aid in determining sediment depth.
- The designer may want to route surface water collected from disturbed areas to a sediment basin prior to release from the site.

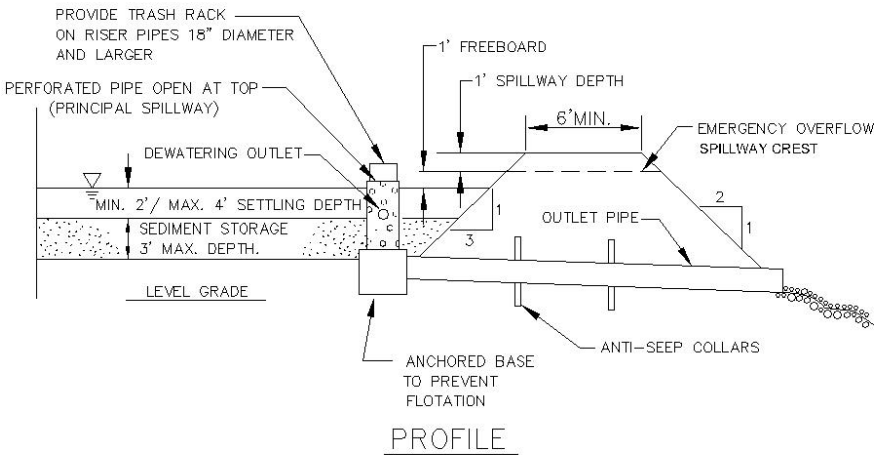
- A qualified engineer should design temporary sediment basins.

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- All damages caused by soil erosion or construction equipment shall be repaired before the end of each working day.
- Remove sediment when the sediment storage zone is half full. This sediment shall be placed in such a manner that it will not erode from the site. The sediment shall not be deposited downstream from the embankment or in or adjacent to a stream or floodplain.
- When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankments and resulting sediment deposit shall be leveled or otherwise disposed of in accordance with the approved erosion and sediment control plan.





NOTE:
50' MINIMUM OF HIGHLY VEGETATED AREA AND OR SEDIMENT FENCE IS REQUIRED PRIOR TO DISCHARGING TO STREAM OR WETLAND.

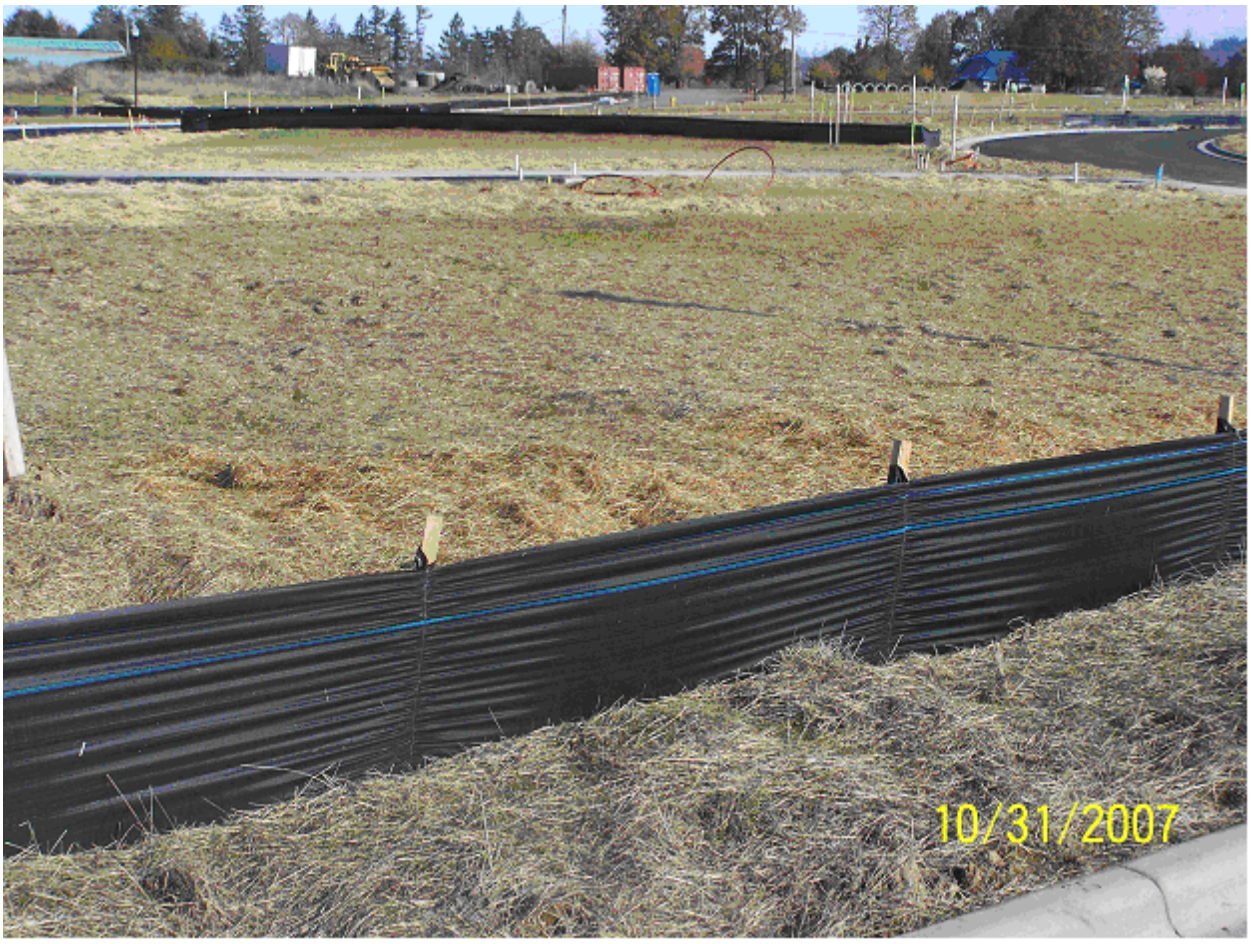
SEDIMENT BASIN

DETAIL DRAWING 4–22

REVISED 01–09

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SEDIMENT FENCE



4.3.10 Sediment Fence

Temporary sediment trap consisting of an entrenched geotextile stretched across and attached to supporting posts. Sediment fences are adequate to treat flow depths consistent with overland or sheet flow. Standard or heavy duty sediment fence fabric must meet specific ASTM requirements, outlined in **Table 4-10.**

Advantages

- Reduces runoff velocity.
- Requires minimal ground disturbance to install.
- Relatively inexpensive.

Disadvantages

- Applicable to small drainage areas and overland flow; not applicable to concentrated flows.
- Incorrect geotextile or installation decreases sediment fence performance.
- Requires frequent maintenance and inspection.

Design Criteria

- See **Table 4-10** for Sediment Fence Fabric Specifications
- Show sediment fence installed along ground contours according to **Table 4-9**
- Sediment fence should only be used for sheet and rill erosion
- Standard or heavy-duty sediment fence filter fabric shall have manufactured stitched loops with 2"x 2"x4' posts. Stitched loops shall be installed on the uphill side of the sloped area.
- Sediment fences should be installed a minimum of 3 feet from toe of slope in order to maximize storage.
- A trench should be excavated 6 inches deep along the line of the posts.
- Trench should be backfilled and the soil compacted on both sides of the sediment fence.
- Posts should be spaced a maximum of 6 feet apart and driven securely into the ground a minimum of 12 inches.
- When sediment fence approaches its termination point, turn fence uphill and extend one full panel (6 ft).
- When joining two or more sediment fences together, join the two end stakes by wrapping the two ends at least one and one half turns and driving the joined stakes into the ground together.
- Height of a sediment fence should not exceed 3 feet. Storage height and ponding height should never exceed 1.5 feet.

Table 4-9 Barrier spacing for general application

BARRIER SPACING FOR GENERAL APPLICATION

INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS		
% Slope	Slope	Maximum Spacing on Slope
10 % Flatter	10:1 or Flatter	300 ft
10 > % < 15	10:1 > x < 7.5:1	150 ft
15 > % < 20	7.5:1 > x < 5:1	100 ft
20 > % < 30	5:1 > x < 3.5:1	50 ft
30 > % < 50	3.5:1 > x < 2:1	25 ft

Table 4-10 Sediment Fence Fabric Specifications

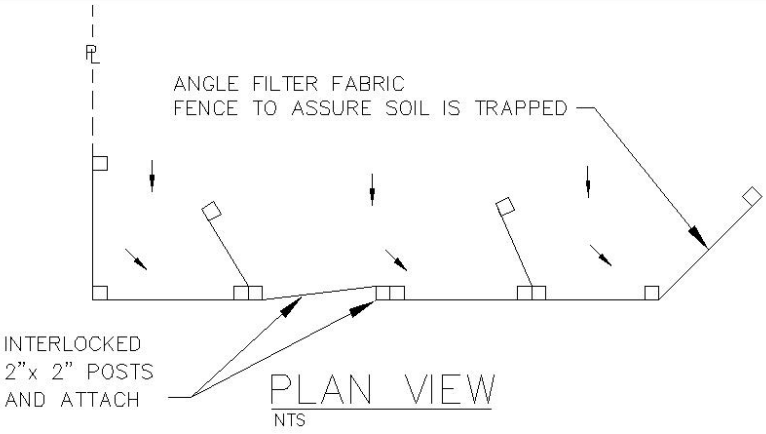
WOVEN POLYPROYLENE SEDIMENT FENCE FABRIC

PROPERTY	TEST PROCDURE	MINIMUM FABRIC VALUE
Grab Tensile Strength	ASTM D-4632	180 lbs.
Grab Elongation	ASTM D-4632	15%
Trapezoid Tear	ASTM D-4533	70 lbs.
Mullen Burst	ASTM D-3786	300 psi
Puncture	ASTM D-4833	80 lbs
Permitivity	ASTM D-4491	.07 sec-1
Permeability	ASTM D-4491	.005 cm/sec
A.O.S.	ASTM D-4751	50 U.S. Sieve
UV Resistance (500 hrs)	ASTM D-4355	90%

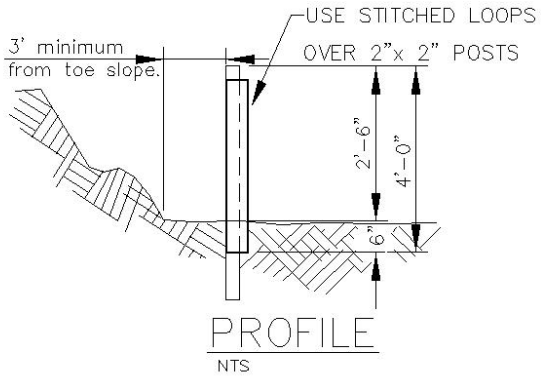
Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Immediately repair any damage.
- Remove accumulated sediment once it has reached 1/3 the height of the sediment fence or 1 ft maximum.
- Inspect for channel formation parallel to the fence, which indicates the geotextile is acting as a flow barrier.
- Replace deteriorated or clogged geotextile.
- Check for under cutting or piping under fence.



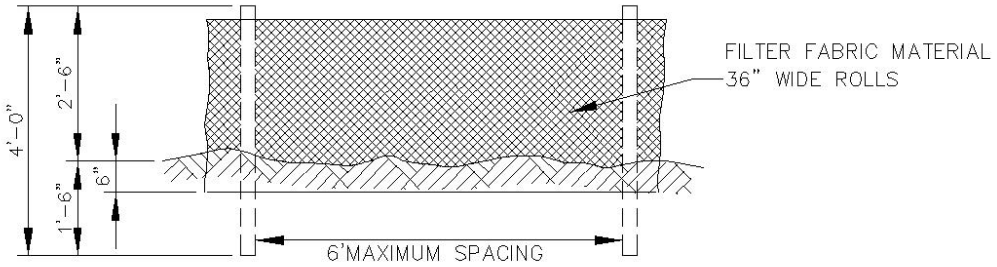
PLAN VIEW
NTS



PROFILE
NTS

NOTES:

1. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
2. 2"x 2" FIR, PINE OR STEEL FENCE POSTS.
3. POSTS TO BE INSTALLED ON UPHILL SIDE OF SLOPE.
4. COMPACT BOTH SIDES OF FILTER FABRIC TRENCH.
5. PANELS MUST BE PLACED ACCORDING TO SPACING ON DETAIL NO.940



FRONT VIEW
NTS

SEDIMENT FENCE

DETAIL DRAWING 4-23

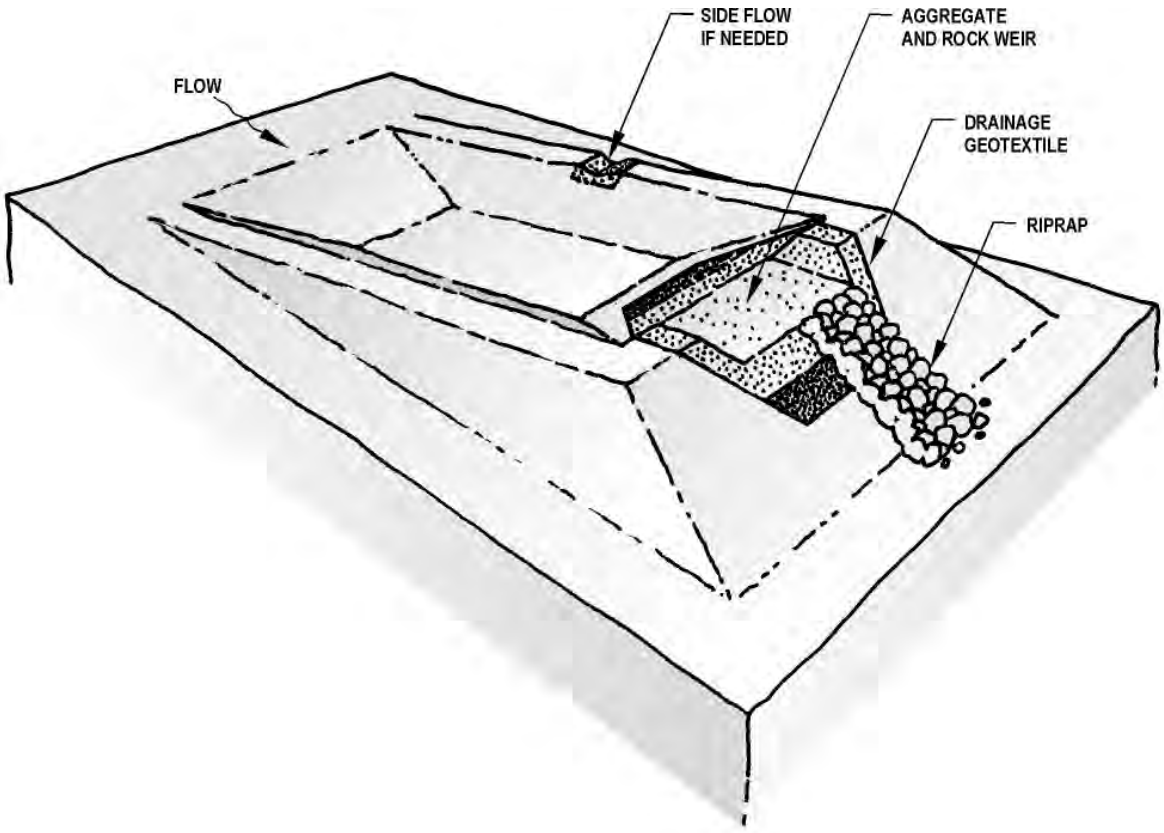
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SEDIMENT TRAP



4.3.11 Sediment Trap



A sediment trap consists of a small, temporary ponding area, with a rock weir or perforated riser pipe at the outlet, formed by excavation or by constructing a weir. The sediment trap serves drainage areas 5 acres and smaller. They are a retention structure designed to remove sediment from runoff by holding a volume of water for a length of time, allowing particles 0.02 mm and large to settle out. Sediment retention should be used as a last line of defense when included in a ESCP and never used by itself.

Combining with Permanent Drainage Facilities

- If a project includes a permanent storm water retention/detention pond, the rough-graded or final-graded facility could function as a trap during construction. Design features of the permanent structure, such as surface area, retention time and outlet control, should meet the design requirements of the temporary facility. Completion of the permanent facility should occur only when all upstream control structures are in place and stabilization of contributing drainage areas is complete.
- If a project includes an infiltration facility, the roughly excavated facility could be used as a trap or basin providing the facility provides the surface area and

retention time required by the trap or basin. Excavate the sides and bottom of the facility to a minimum of 3 foot above final grade with a backhoe working at "arms length" to minimize disturbance and compaction of the infiltration surface.

- Additionally, any required pretreatment facilities should be fully constructed prior to any release of sediment-laden water to the facility. Pretreatment and shallow excavations are intended to prevent the clogging of soil with fines.

Advantages

- Protect downstream riparian properties from sediment deposits.
- Prevent reduced downstream capacity due to sediment deposition in a stream channel.
- Prevents clogging of downstream facilities.
- Remove particles up to medium silt size (0.02 mm).
- Surface water conveyances can be connected to the facility as site development proceeds. The designer may want to route surface water collected from disturbed areas of the site through a sediment trap prior to release from the site.

Disadvantages

- May become an attractive nuisance. Care must be taken to adhere to all safety practices.
- Maintenance and sediment removal is essential for adequate performance.
- Serves limited areas.
- Does not reduce turbidity resulting from fine silts and clays in runoff. Traps are more effective when used in conjunction with other measures such as seeding and mulching.

Design Criteria

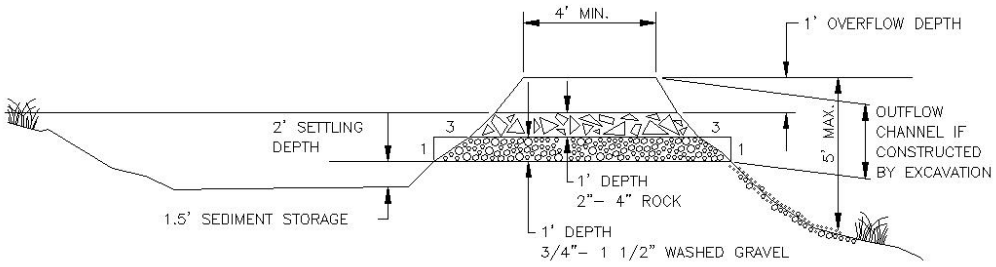
- Construct prior to any upslope clearing and grading.
- Locate in a low area where the trap will intercept all or most of the runoff from the disturbed area before it enters a waterway, considering safety in case structure fails.
- Locate the trap so that it is readily accessible for maintenance.
- Provide for diversion dikes and ditches, as needed, to collect and divert water toward the trap.
- Sediment storage volume can be calculated using the USLE assuming a minimum one year sediment accumulation period for design purposes. To convert tons of sediment as calculated to cubic feet, multiply 0.05 tons per cubic foot.

- Determine the bottom surface area of the sediment trap using the calculated sediment volume and the maximum 1.5 depth.
- Determine the total trap dimensions by adding an additional 2 feet of depth for settling volume (before overtopping of spillway) above the sediment storage volume, while not exceeding 3:1 side slopes.
- Design the trap with a level bottom, 3:1 or flatter side slopes and a L:W ratio of 3.
- Construct the trap as the first step in the clearing and grading of the site.
- Form the trap by excavation or by construction of compacted embankment. If the trap is formed by embankment, the designer should note that dam safety regulation may apply to heights exceeding 5 foot. The embankment should be stabilized using a cover method such as seeding, mulching or erosion control matting.
- Water temperature in the trap may be too high for direct release. Always moderate the water temperature before it drains into a lake, stream, wetland or waterway. Whenever possible, release the trap discharge onsite onto a relatively level, densely grassed area at least 50 feet from a waterway or wetland.
- Evaluate the release areas on a site-by-site basis in order to determine appropriate locations for and methods of releasing runoff. Do not use vegetated wetlands for this purpose.

Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

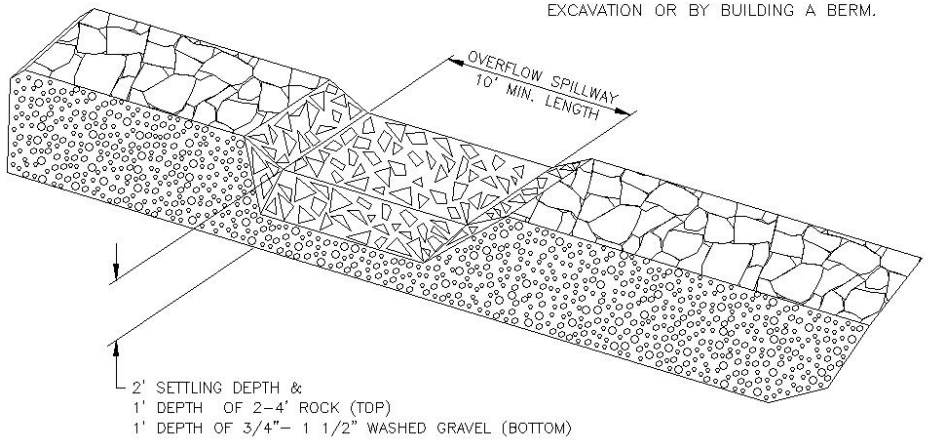
- Constant maintenance is essential for proper functioning.
- Remove sediment from the trap when it reaches one-third the storage capacity.
- Repair any damage to the trap, the embankments or the slopes.



CROSS SECTION

NTS

NOTE: MAY BE CONSTRUCTED BY EXCAVATION OR BY BUILDING A BERM.



SEDIMENT TRAP OUTLET

NTS

NOTE:
A FILTER FABRIC FENCE OR SIMILAR FILTER MUST BE CONSTRUCTED TO FILTER RUNOFF FROM THE SEDIMENT TRAP PRIOR TO DISCHARGE FROM THE CONSTRUCTION SITE.

SEDIMENT TRAP

DETAIL DRAWING 4-24

REVISED 01-09

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SIDEWALK SUB-GRADE GRAVEL BARRIER



4.3.12 Sidewalk Sub-grade Gravel Barrier

A sidewalk sub-grade gravel barrier is an application that provides storage and filtration from run-off on sites with mild slopes. It can be used on all types of projects but generally on single-family. Normal installation occurs when excavating for footing and foundation.

Advantages

- Easy to install
- Very economical
- Can retain suspended soils

Disadvantages

- May require additional measure depending upon soil type
- May need periodic maintenance for removal of suspended materials
- May not be acceptable by local jurisdiction for sub-base material when pouring sidewalk

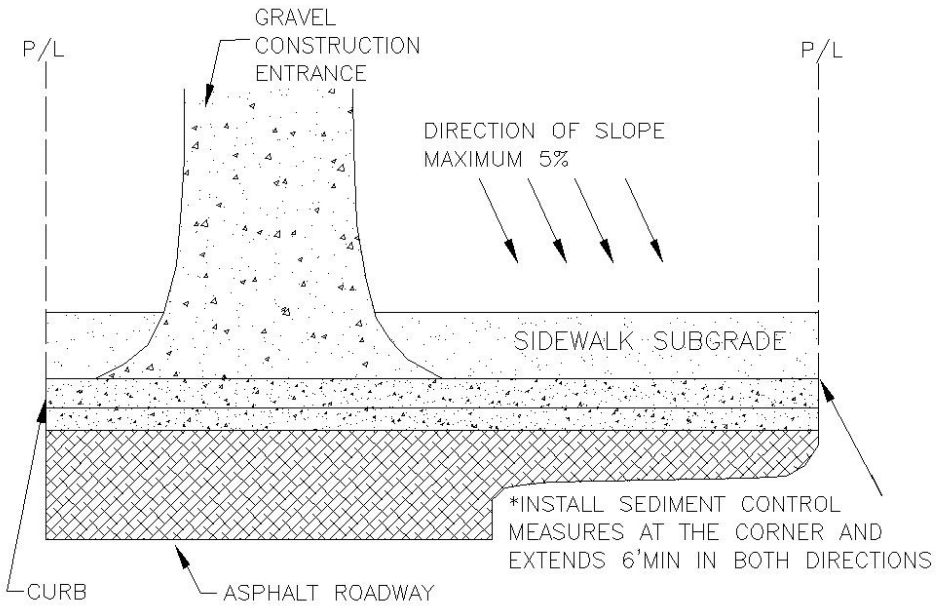
Design Criteria

- Install where the site slopes to a street with curbs and slopes are 5% or less
- Plug all weep holes in curb
- Sidewalk sub-grade must have a minimum 4-inch depth and a 4-foot width.
- A 2 inch layer of approved sub-base material must be installed
- A gravel filter berm may be installed along the inside edge, or toe of slope to increase filtration
- Install sediment barrier on the downhill corner of property to intercept run-off
- On development sites, install sidewalk sub-grade as part of post construction
- On single family sites, install as part of the footing/foundation dig out
- If sidewalk concrete is to be poured prior to establishment of permanent site cover, approved sediment barriers must be installed prior to pouring sidewalk

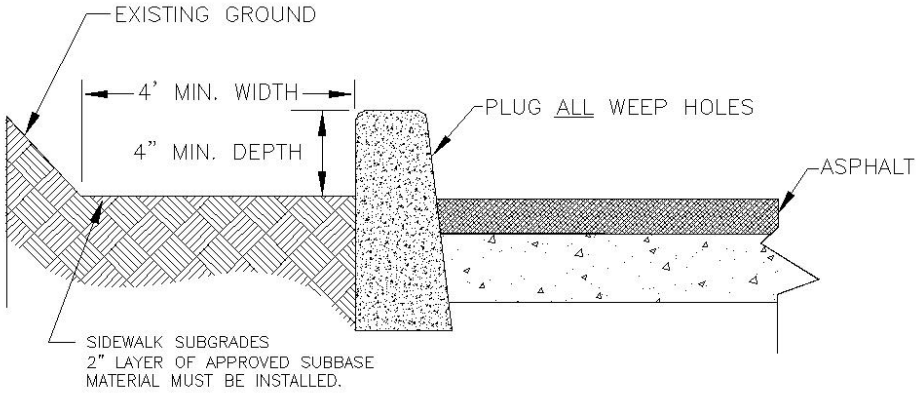
Inspection & Maintenance

Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Remove and replace gravel when filtering capacity is reduced by half, to maintain performance



PLAN VIEW



PROFILE

NOTE: SIDEWALK SUBGRADE CAN BE USED FOR ALL CONSTRUCTION ACTIVITIES

SIDEWALK SUBGRADE

DETAIL DRAWING 4–25 REVISED 01–09

TIRE WASH

Type 1



Type 2



4.2.13 Tire Wash Facility

Two types of tire wash facilities are available depending on the severity of sediment tracking and the size and duration of project. Type 1 can be retro-fitted in the field, using geotextile fabric and rock. Like a stabilized construction entrance it is graded so that collected wash water is conveyed to a sediment trap, basin or other suitable treatment facility. Type 2 consists of a shallow concrete lined basin partially filled with water, through which exiting vehicles drive.

Advantages

- Reduces traffic hazards caused by debris on public roadways.
- Reduces sediment on roadways, which can wash into the storm sewer system.
- Type 1 is easy to construct and is relatively inexpensive.
- Type 2 is useful for high traffic volumes or large projects of long duration.

Disadvantages

- Only works if installed at every location where construction traffic leaves the site.
- Fills with sediment quickly and requires frequent maintenance.
- Requires a source of wash water.
- Requires a turnout or doublewide exit to avoid entering vehicles having to drive through wash area.
- Type 2 is costly to construct.
- Both facilities will generate large volumes of sediment-laden water, requiring treatment elsewhere on site.

Design Criteria

Type 1 (temporary)

- Minimum length: 40 ft.
- Minimum width: 10 ft.
- Minimum rock depth: 8 in.
- Average tire wash sump: 18 in.
- Install subgrade geotextile fabric as a liner
- Use 4-6 in. rock over geotextile fabric
- **Alternate:** 3 in. asphalt lift over a stable base coarse
- Grade the pad to drain to suitable collection and treatment facility.
- Install fencing as necessary to restrict exiting construction vehicle traffic to the tire wash.

Type 2 (permanent)

- Minimum length: 40 ft. with sloping ingress and egress
- Minimum width: 10 ft.
- Minimum rock depth: 8 in.
- Average tire wash sump: 18 in.
- Run out impervious area should be a minimum of 50 ft, graded back to facility.
- Line bottom of basin with geotextile and 12 in. of rock base coarse.
- Construct basin out of 12 in. concrete with steel reinforcement.
- Provide water supply.
- Provide outlet for sediment-laden water discharge to treatment facility or provide pumps and tanks for water treatment.

Inspection & Maintenance

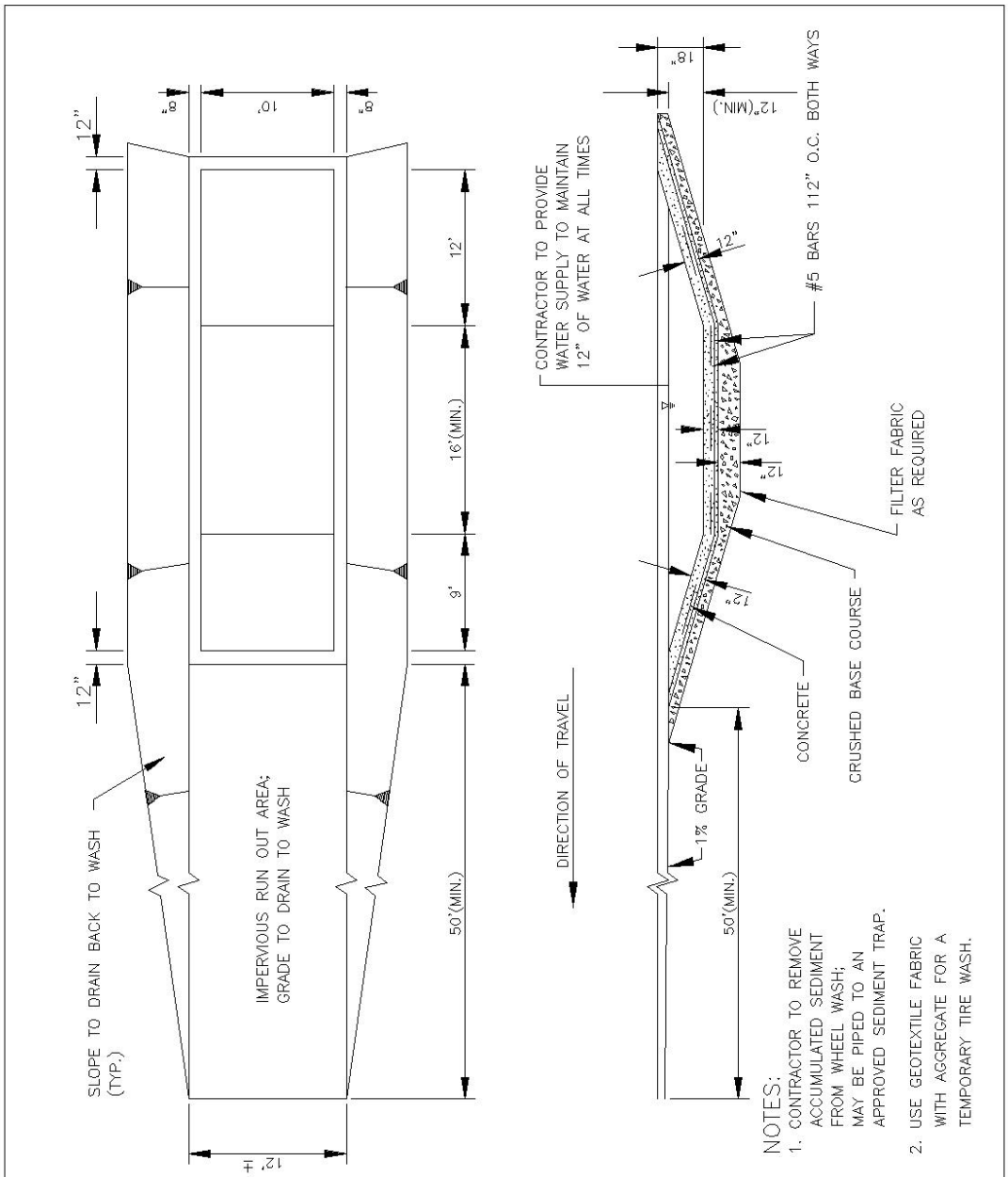
- Inspect weekly minimum, or more depending upon use.

Type 1

- Clean or replace rock with clogged with sediment.
- Re-grade rock as needed.
- Maintain tire wash sump depth
- Maintain a clean run-out pad
- Immediately remove any rock that gets carried from the pad to the roadway.
- Ensure that wash water drainage, collection and treatment system is functioning.

Type 2

- Remove/discharge wash water as needed.
- Remove accumulated sediment from tire wash facility in order to maintain tire wash sump.
- Ensure that wash water collection and treatment system is functioning.

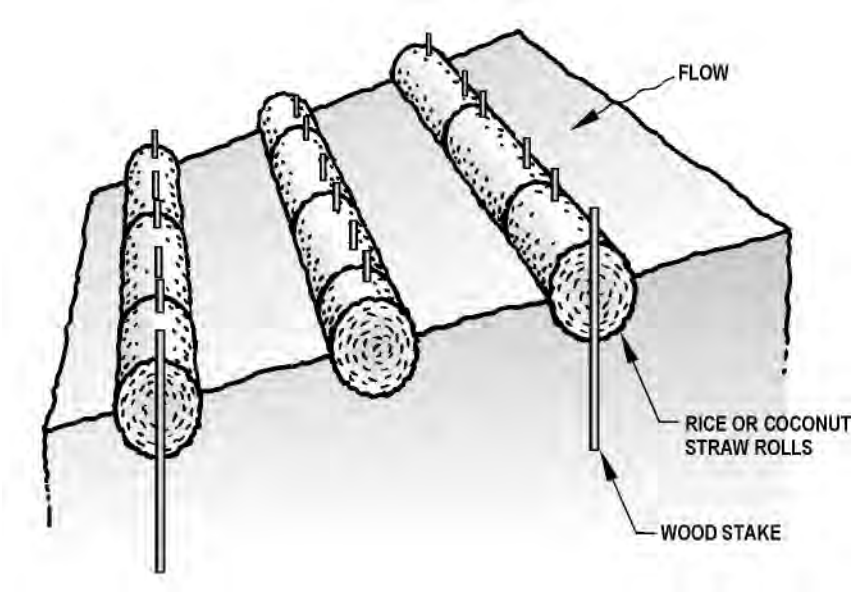

12"
8"
10'
8"
12'
16'(MIN.)
9'
50'(MIN.)
12" ±
SLOPE TO DRAIN BACK TO WASH
(TYP.)
IMPERVIOUS RUN OUT AREA;
GRADE TO DRAIN TO WASH
CONTRACTOR TO PROVIDE
WATER SUPPLY TO MAINTAIN
12" OF WATER AT ALL TIMES
DIRECTION OF TRAVEL
18"
12"(MIN.)
#5 BARS 112" O.C. BOTH WAYS
12"
12"
12"
12"
FILTER FABRIC
AS REQUIRED
CRUSHED BASE COURSE
CONCRETE
1% GRADE
50'(MIN.)
NOTES:
1. CONTRACTOR TO REMOVE
ACCUMULATED SEDIMENT
FROM WHEEL WASH;
MAY BE PIPED TO AN
APPROVED SEDIMENT TRAP.
2. USE GEOTEXTILE FABRIC
WITH AGGREGATE FOR A
TEMPORARY TIRE WASH.
TIRE WASH
DETAIL DRAWING 4-26
REVISED 01-09

WATTLES





4.3.14 Wattles



Wattles are manufactured from straw, coconut, or other material that is wrapped in tubular plastic netting. They are approximately 8-9 in. diameter by 7-25 ft. long. Wattles are placed in shallow trenches and staked along the contour of newly constructed or disturbed slopes.

Advantages

- They can often replace sediment fences on steep slopes.
- Wattles are short-term solution to help establish native vegetation.
- Wattles store moisture for vegetation planted immediately upslope.
- May be left in place to biodegrade and/or photodegrade.
- Straw becomes incorporated into the soil with time, adding organic material to the soil and retaining moisture for vegetation.
- Reduces runoff velocity.
- Light weight and easy to install.

Disadvantages

- Wattles only function for one or two seasons.
- If not installed properly with sufficient trench, wattles may fail during the first rain event.
- Wattles may require maintenance to ensure that the stakes are holding and the wattles are still in contact with the soil. This is especially true on steep slopes in sandy soil.
- Low sediment retaining capacity may require frequent maintenance.

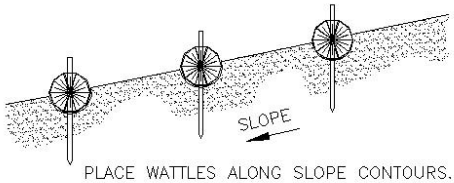
Design Criteria

- Wattles can be made from straw, coconut, or other approved material.
- Slope requires minor preparation prior to installation.
- Rills and shallow gullies should be smoothed as work progresses.
- Wattles should be installed on contours. Trench should be deep enough to accommodate half the thickness of the wattle.
- Wattles should be installed from the bottom of the slope up.
- Wattle must be tight against the soil in trench. Make sure no gaps exist between the soil and the wattle.
- If live willow stakes are installed, use a straight bar to drive holes through wattles.
- Stakes must be driven a minimum of 12 in. into undisturbed material.
- Install stakes every 4 ft. Additional stakes may be driven on the downslope side of the trenches on highly erosive or very steep slopes.

Inspection & Maintenance

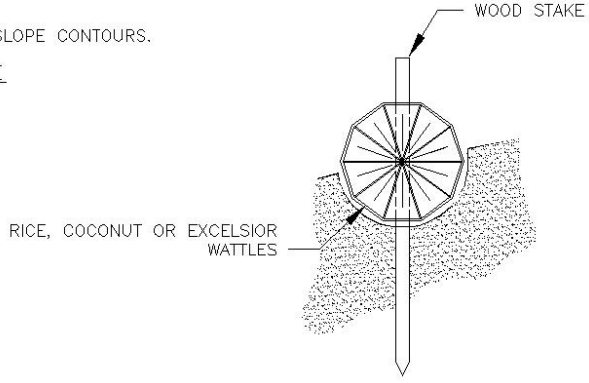
Site Condition	Minimum Frequency
1. Active Period.	Daily when stormwater runoff, including runoff from snowmelt, is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (7) consecutive calendar days.	Once every two (2) weeks.
4. Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

- Make sure the wattles are in contact with the soil.
- Re-seed, replant vegetation, or install matting if necessary to stabilize slope.

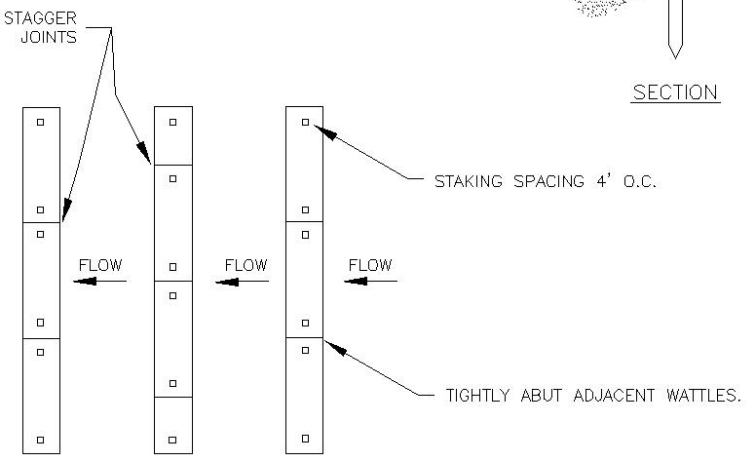


PLACE WATTLES ALONG SLOPE CONTOURS.

PROFILE



SECTION



PLAN VIEW

NOTES:

1. STAKING SPECIFICATIONS:
   a. 1"X2" WOODEN STAKES
   b. ADDITIONAL STAKES MAY BE INSTALLED ON DOWNHILL SIDE OF WATTLES, ON STEEP SLOPE OR HIGHLY EROSIVE SOILS.
2. SPACING IN ACCORDANCE WITH DETAIL 940.

WATTLES

DETAIL DRAWING 4–27 REVISED 01–09

CHAPTER 5
POLLUTION CONTROL MEASURES AND BMP'S

5.1 Management of Other Construction Site Pollutants

There are numerous potential pollutants, other than erosion and sediment, associated with construction activities. Potential pollutants include pollutants associated with the use of concrete and other cement-related mortars and the handling, application, and disposal of construction products and chemicals such as paints, adhesives, and solvents. The improper use and handling of construction materials can result in wash water, spills or wastes being left on the ground. These chemicals can infiltrate into soils causing groundwater contamination or wash-off to surface waters during subsequent storms.

Although this manual is not intended to address all aspects of construction site pollution control, some issues overlap with erosion and sediment control and must be taken into account in the overall planning process.

At a minimum the contractor should provide pollution prevention for:

1) Off-site tracking of soils;
2) Material management;
3) Waste management;
4) Vehicle and equipment management;
5) Site history.

Each construction project is unique, and understanding the pollution risks for each construction activity is essential to successfully selecting and implementing pollution control BMP's. Defining these risks requires careful review of the site characteristics and the nature of the construction project. Once these risks are defined, BMP objectives can be developed and pollution control BMP's selected. In general the pollution control BMP objectives for construction projects are as follows.

- **Practice Good Housekeeping** – Perform activities in a manner which keeps potential pollutants from either draining or being transported off-site by managing pollutant sources and modifying construction activities.
- **Contain Waste** – Dispose of all construction waste in designated areas and keep storm water from flowing on or off of these areas.

Table 5-1 presents disposal and management alternatives for typical potential pollutants associated with construction activities.

Table 5-1 Quick reference for pollution control

DISCHARGE/ACTIVITY	BMP DETAIL #	BMP/POLLUTION CONTROL
Painting & Paint Removal		
Excess paint	3, 4, 7	Oil Based- 1. Recycle/reuse. 2. Dispose as hazardous waste. Water Based – 1. Recycle/reuse. 2. Dry residue in cans, dispose as trash. 3. If volume is too much to dry, dispose as hazardous waste.
Paint cleanup	3, 8	Wipe paint out of brushes, then: For oil based paints, 1. Filter & reuse thinners, solvents. 2. Dispose as hazardous waste. For water based paints, 1. Rinse to sanitary sewer.
Paint stripping (with solvent)	3	1. Dispose as hazardous waste.
Non-hazardous paint scraping/sand blasting	3	1. Dry sweep, dispose as trash.
HAZARDOUS paint scraping/sand blasting (e.g. marine paints or paints containing lead or tributyl tin)	3, 8	1. Dry sweep, dispose as hazardous waste.

Table 5-1 (cont.) Quick reference for pollution control

DISCHARGE/ACTIVITY	BMP DETAIL #	BMP/POLLUTION CONTROL
General Construction		
Soil from excavations during wet weather periods	9	1. Should not be placed in street, on paved areas or near waterways. 2. Remove from site or backfill by end of day. 3. Cover with tarpaulin or surround with sediment barrier, or use other runoff controls (see chapter 4) 4. Place inlet protection over storm drain inlets. Note: Thoroughly sweep following removal of dirt in all four alternatives.
Soil from excavations placed on paved surfaces during dry season	9	1. Keep materials out of storm conveyance systems and thoroughly remove via sweeping. 2. Cover to prevent wind erosion.
Cleaning streets in construction areas	7	1. Dry sweep. 2. Use silt ponds, inlet protection and/or similar sediment control techniques when flushing pavement.
Soil erosion, sediments	(see chapter 4)	1. Cover disturbed soils, use erosion controls, block entry to storm drain. 2. Seed or plant as soon as possible.
Fresh cement, grout, mortar	10	1. Use/reuse excess. 2. Dispose to trash. 3. Do not allow into surface water and/or collection systems.
Washwater from concrete/mortar (etc.) cleanup	10	1. Wash onto dirt area and spade in. 2. Pump and remove to appropriate disposal facility. 3. Settle; pump water to vegetated area at least 50 m from surface water.
Rinsewater from concrete mixing trucks	10	1. Return truck to yard for rinsing into settling pond or dirt area. 2. At construction site, wash into settling pond or dirt area and spade in, never allow into storm sewer or waterways.

Table 5-1 (cont.) Quick reference for pollution control

DISCHARGE/ACTIVITY	BMP DETAIL #	BMP/POLLUTION CONTROL
General Construction		
Runoff from Foundation Forms & Form Treatment	4, 6	1. Store forms on a pervious surface 2. Place a tarpaulin over the forms when not in use to prevent contact with precipitation. 3. Store form treatment fluids in secondary containment at a designated area.
Non-hazardous construction and demolition debris	7	1. Recycle/reuse (concrete, wood, etc.) 2. Dispose as trash.
Hazardous demolition and construction debris (e.g. asbestos).	8	1. Dispose as hazardous waste.
Concrete saw-cut slurry. (Wet sawing)	10	1. Use dry cutting technique and sweep up residue. 2. Place a berm on down-slope side of project to collect slurry before it flows off site. 3. Vacuum slurry and dispose off-site. 4. Shovel out gutters; dispose residue to dirt area, construction yard or landfill. 5. Block all storm drains or curb inlets
Construction dewatering (Nonturbid, uncontaminated groundwater)	1	1. Recycle/reuse. 1. Discharge to storm drain upon local agency approval. 3. Settle, pump water to sanitary sewer or vegetated area at least 50 m from surface water. Discharge to sanitary sewer may require a permit from the POTW.
Construction dewatering (Other than nonturbid, uncontaminated groundwater)	1	1. Recycle/reuse. 2. Discharge to sanitary sewer, may need permit from the POTW. 3. As appropriate, treat prior to discharge to storm drain, requires NPDES permit.
Leaks from garbage dumpsters	6	1. Collect, contain leaking material. Eliminate leak, keep covered, return to leasing company for immediate repair. 2. If dumpster is used for liquid waste, use plastic liner.

Table 5-1 (cont.) Quick reference for pollution control

DISCHARGE/ACTIVITY	BMP DETAIL #	BMP/POLLUTION CONTROL
General Construction (cont.)		
Leaks from construction debris bins	6, 4	1. Insure bins are used for dry nonhazardous materials only. (Suggestion: Fencing, covering help prevent misuse).
Dumpster cleaning water	6	1. Clean at dumpster owner's facility and discharge waste through grease interceptor to sanitary sewer. 2. Clean on site and discharge through grease interceptor to sanitary sewer.
Cleaning driveways, paved areas	6	1. Sweep and dispose as trash (Dry cleaning only). 2. For vehicle leaks, follow this 3-step process: a. Clean up leaks with rags or absorbents. b. Sweep, using granular absorbent material (cat litter). c. Mop and dispose of mop water to sanitary sewer.
Paving Operations	2	1. Avoid paving during wet weather 2. Protect drainage systems by diverting runoff or trap/ filter system. 3. Place drip pans or absorbent materials under paving equipment when not in use.
Steam cleaning of sidewalks, plazas	6	4. Collect all water and properly dispose of - do not allow runoff to enter storm sewer. 2. Follow this 3-step process: a. Clean oil leaks with rags or absorbents. b. Sweep (Use dry absorbent as needed).
Aggregate wash from driveway/patio construction	6	1. Wash onto dirt area, spade in. 2. Pour driveway approach last. 3. Collect and remove to appropriate disposal facility. 4. Settle, pump water to vegetated area at least 50 meters from surface water.

Table 5-1 (cont.) Quick reference for pollution control

DISCHARGE/ACTIVITY	BMP DETAIL #	BMP/POLLUTION CONTROL
Landscape/Garden Maintenance		
Pesticides	5, 8, 14	1. Use all material in container. Rinse containers use rinsewater as product. Dispose rinsed containers as trash. 2. Dispose unused pesticide as hazardous waste.
Fertilizer Applications	5, 8, 14	1. Sweep any "over spray" material from streets, sidewalks and driveways.
Yard & Garden clippings	7	1. Compost. 2. Take to landfill.
Tree trimming	7	1. Chip if necessary, before composting or recycling.
Vehicle / Equipment Wastes		
Used motor oil & oil filters	14, 6, 4, 8	1. Use secondary containment while storing, send to recycler.
Antifreeze	14, 6, 4, 8	1. Use secondary containment while storing, send to recycler.
Other vehicle fluids and solvents	14, 6, 4, 8	1. Dispose as hazardous waste.
Automobile batteries	14, 4, 8	1. Use secondary containment while storing. 2. Send to auto battery recycler. 3. Take to Recycling Center.
Vehicle Washing	11, 14	1. Wash on pervious surface and use cold water only. 2. Never allow runoff to directly discharge to storm drainage systems.
Mobile Vehicle Washing	11	1. Collect wash water and discharge to sanitary sewer w/ agency approval; never allow wash water to discharge to storm drainage systems.
Rinsewater from dust removal at new car fleets	11	1. If rinsing dust from exterior surfaces for appearance purposes, do not use soap (cold water only).

Table 5-1 (cont.) Quick reference for pollution control

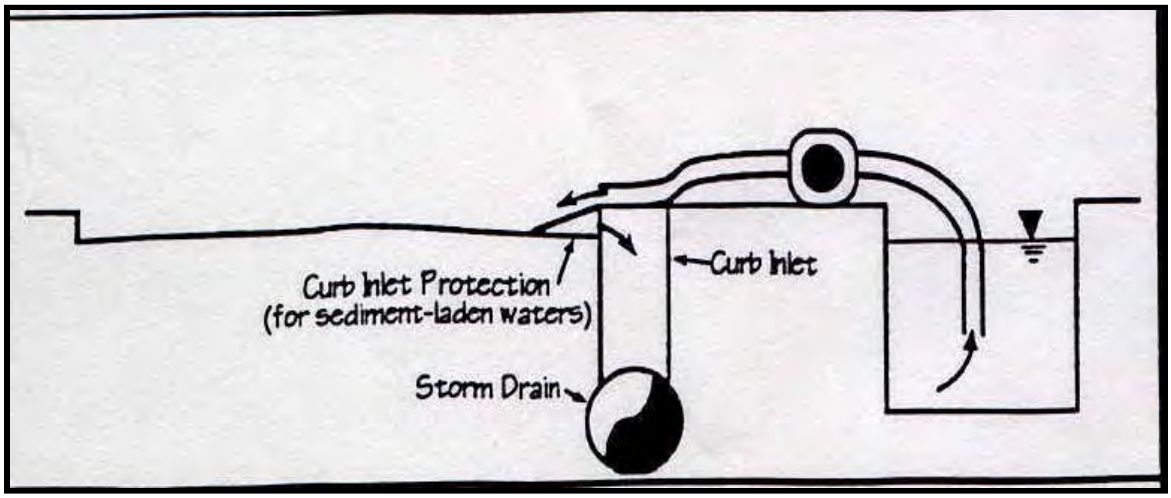
DISCHARGE/ACTIVITY	BMP DETAIL #	BMP/POLLUTION CONTROL
Vehicle leaks & equipment fueling	6, 13, 14	1. Clean up leaks with rags or absorbents. 2. Sweep, using granular absorbent material (cat litter). 3. Fuel only in designated area and place a spill kit in the fueling area.
Other Wastes		
Roof drains		1. If roof is contaminated with industrial waste products, discharge to sanitary sewer with approval from local sanitary authority (may need a discharge permit). 2. If no contamination is present, discharge to pervious surface.
Cooling water Air conditioning condensate		1. Recycle/reuse. 2. Discharge permit may be required, contact local sanitary authority.
Pumped groundwater, infiltration/foundation drainage (contaminated)		1. Recycle/reuse (landscaping, etc.). 2. Discharge permit may be required, contact local sanitary authority
Fire fighting flows		Under emergency conditions, Fire Department will determine the appropriate procedures to use. If contamination is present, and life and safety are not at issue, Fire Department will attempt to prevent flow to stream or storm drainage system.
Clean-up wastewater from sewer back-up		1. Follow this procedure: a. Block storm drain, contain, collect and return spilled material to the sanitary sewer. b. Block storm drain; rinse remaining material to collection point and pump to sanitary sewer. (No rinsewater may flow to storm drain.)

5.2 Pollution Control BMP's

This chapter describes specific BMP's for common construction activities that may pollute storm water. The following fact sheets were adapted from the Construction Methods Handbook developed in 1993 by California's Storm Water Quality Task Force and are suitable for inclusion in many ESCP's or PCP's for typical contractor activities. The BMP's listed are not an exhaustive list, nor will every BMP be appropriate for every situation. Therefore, suggested BMP's that are inappropriate may be deleted and additional BMP's for specific site conditions should be added. In addition, the selection and implementation of BMP's should be reviewed on a regular basis to match the changing conditions at construction sites.

The following fact sheets have been included.

- BMP 1 Dewatering Operations
- BMP 2 Paving Operations
- BMP 3 Structure Construction and Painting
- BMP 4 Material Delivery and Storage
- BMP 5 Material Use
- BMP 6 Spill Prevention and Control
- BMP 7 Solid Waste Management
- BMP 8 Hazardous Waste Management
- BMP 9 Contaminated Soil Management
- BMP 10 Concrete Waste Management
- BMP 11 Vehicle and Equipment Cleaning
- BMP 12 Vehicle and Equipment Fueling
- BMP 13 Vehicle and Equipment Maintenance
- BMP 14 Employee/Subcontractor Training



BMP 1: DEWATERING OPERATIONS

DESCRIPTION
Prevent or reduce the discharge of pollutants to storm water from dewatering operations by using sediment controls and by testing the groundwater for pollution.

APPROACH
There are two general classes of pollutants that may result from dewatering operations: sediment, and toxics and petroleum products. High sediment content in dewatering discharges is common because of the nature of the operation. On the other hand, toxics and petroleum products are not commonly found in dewatering discharges unless the site or surrounding area has been used for light or heavy industrial activities, or the area has a history of groundwater contamination. The following steps will help reduce storm water pollution from dewatering discharges:

Sediment
- Use sediment controls to remove sediment from water generated by dewatering.
- Use filtration to remove sediment from a sediment trap or basin. Filtration can be achieved with:
  - Sump pit and a perforated or slit standpipe with holes and wrapped in filter fabric. The standpipe is surrounded by stones, which filter the water as it collects in the pit before being pumped out. Wrapping the standpipe in filter fabric may require an increased suction inlet area to avoid clogging and unacceptable pump operation.
  - Floating suction hose to allow cleaner surface water to be pumped out.

Toxics and Petroleum Products
- In areas suspected of having groundwater pollution, sample the groundwater near the excavation site and have the water tested for known or suspected pollutants at a certified laboratory. Check with the Department of Environmental Quality (DEQ) and the local wastewater treatment plant for their requirements for dewatering, additional water quality tests, and disposal options.
- With a permit, you may be able to recycle/reuse pumped groundwater for landscape irrigation, or discharge to the storm sewer. With a permit from the DEQ or a local agency, you may be able to treat pumped groundwater and discharge it to the municipal wastewater treatment plant via the sanitary sewer.
- For a quick reference on disposal alternatives for specific wastes, see Table 5-1, Quick Reference – Disposal Alternatives.

TARGET POLLUTANTS

● Likely to have significant impact ○ Probable Low or Unknown impact

● Sediment	○ Nutrients	◒ Toxic Materials
○ Oil & Grease	○ Floatable Materials	○ Other Construction Waste



BMP 2: PAVING OPERATIONS

DESCRIPTION

Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent run-on and runoff pollution, properly disposing of wastes, and training employees and subcontractors.

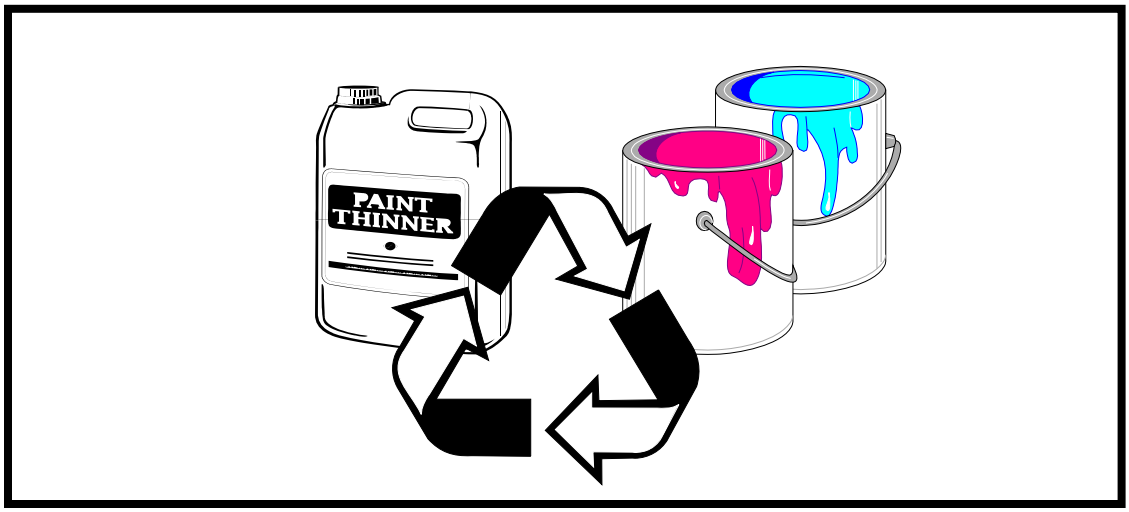
APPROACH

- Avoid paving during wet weather.
- Store materials away from drainage courses to prevent storm water run-on (see BMP 4, Material Delivery and Storage).
- Protect drainage courses, particularly in areas with a grade, by employing BMP's to divert runoff or trap/filter sediment.
- Leaks and spills from paving equipment can contain toxic levels of heavy metals and oil and grease. Place drop pans or absorbent materials under paving equipment when not in use. Clean up spills with absorbent materials rather than burying. See BMP 13 (Vehicle and Equipment Maintenance) and BMP 6 (Spill Prevention and Control) in this chapter.
- Cover catch basins and manhole when applying seal coat, track coat, slurry seal, fog seal, etc.
- Shovel or vacuum saw cut slurry and remove from site. Cover or barricade storm drains during saw cutting to contain slurry.
- If paving involves Portland cement concrete, see BMP 10 (Concrete Waste Management).
- If paving involves asphaltic concrete, the following precautions may help prevent pollutant from entering storm water:
  - Do not allow sand or gravel placed over new asphalt to wash into storm drains, streets, or creeks by sweeping. Properly dispose of this waste by referring to BMP 7 (Solid Waste Management) in this chapter.
  - Old asphalt must be disposed of properly. Collect and remove all broken asphalt from the site and recycle whenever possible.
  - If paving involves on-site mixing plant, follow the storm water permitting requirements for industrial activities.
- Train employees and subcontractors.

TARGET POLLUTANTS

● Likely to have significant impact ○ Probable Low or Unknown impact

◒ Sediment	○ Nutrients	◒ Toxic Materials
◒ Oil & Grease	○ Floatable Materials	○ Other Construction Waste



BMP 3: PAINTING

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from structure construction and painting by enclosing or covering or berming building material storage areas, using good housekeeping practices, using safer alternative products and training employees and subcontractors.

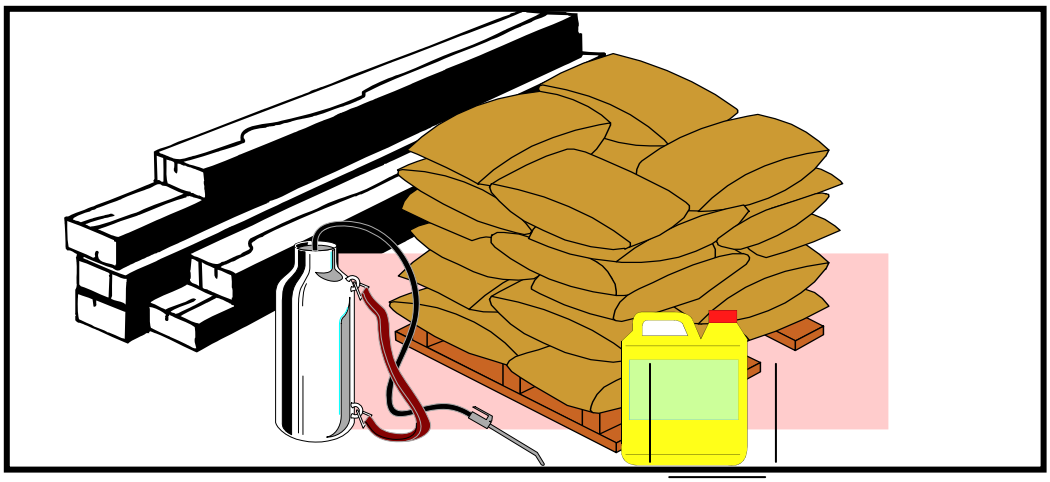
APPROACH

- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Use soil erosion control techniques if bare ground is exposed.
- Buy recycled or less hazardous products to the maximum extent practicable.
- Conduct painting operations consistent with local air quality and OSHA regulations.
- Properly store paints and solvents. See BMP 4 (Material Delivery and Storage) in this chapter.
- Properly store and dispose waste materials generated from the activity. See the waste management BMPs (BMP 7 to BMP 10) in this chapter.
- Recycle residual paints, solvents, lumber and other materials to the maximum extent practicable.
- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.
- Clean the storm drain in the immediate construction area after construction is completed.
- Educate employees who are doing the work.
- Inform subcontractors of company policy on these matters and include appropriate provisions in their contract to make certain proper housekeeping and disposal practices are implemented.
- For a quick reference on disposal alternatives for specific wastes, see Table 5-1.

TARGET POLLUTANTS

● Likely to have significant impact ○ Probable Low or Unknown impact

○ Sediment	○ Nutrients	◒ Toxic Materials
○ Oil & Grease	● Floatable Materials	● Other Construction Waste



BMP 4: MATERIAL DELIVERY AND STORAGE

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from material delivery and storage by minimizing the storage of hazardous materials on-site, storing materials in a designated area, installing secondary containment, conducting regular inspection, and training employees and subcontractors.

The best management practice covers only material delivery and storage. For other information on materials, see BMP 5 (Material Use), or BMP 6 (Spill Prevention and Control). For information on wastes, see the waste management BMP's in this chapter.

APPROACH

The following materials are commonly stored on construction sites:

- Soil
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster or other products
- Petroleum products such as fuel, oil, and grease, and
- Other hazardous chemicals such as acids, lime, glues, paints, solvents, and curing compounds

Storage of these materials on-site can pose the following risks:

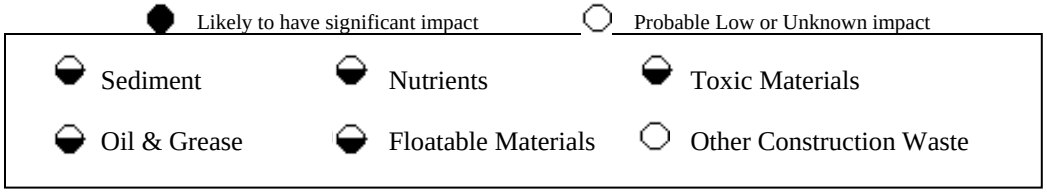
- Storm water pollution
- Injury to workers or visitors
- Groundwater pollution
- Soil contamination

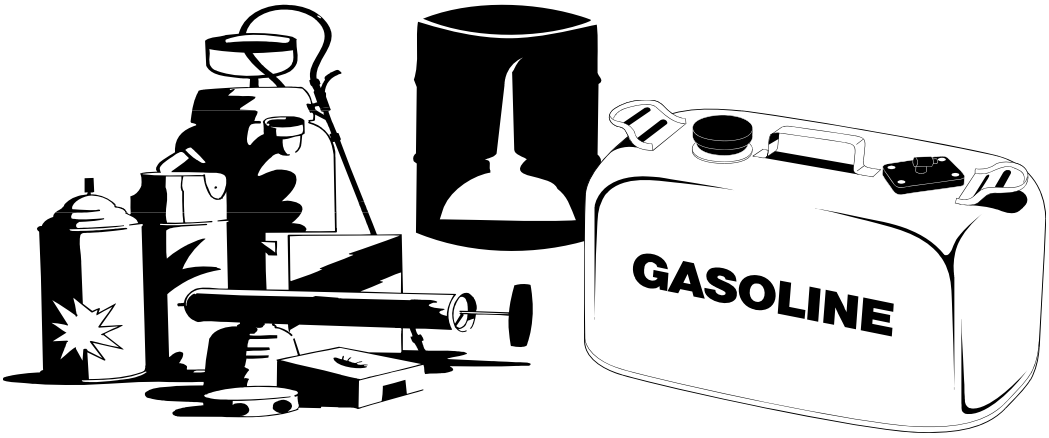
The following steps should be taken to minimize risk of pollution:

- Designate areas of the construction site for material delivery and storage.
  - Place near the construction entrances, away from waterways
  - Avoid transport near drainage paths or waterways
  - Surround with earth berms
  - Place in an area which will be paved
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes or your area. Contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements.
- For a quick reference on disposal alternatives for specific wastes, see Table 5-1, Quick Reference – Disposal Alternatives.
- Keep an accurate, up-to-date inventory of materials delivered and stored on-site.
- Keep your inventory down.
- Minimize hazardous materials on-site storage.
- Handle hazardous materials as infrequently as possible.

- During the rainy season, consider storing materials in a covered area. Store materials in secondary containment's such as an earthen dike, horse trough, or even a child's wading pool for non-reactive materials such as detergents, oil, grease, and paints. Small amounts of material may be secondarily contained in "bus boy" trays or concrete mixing trays.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, in secondary containment.
- If drums must be kept uncovered, store them at a slight angle to reduce ponding of rainwater on the lids and to reduce corrosion.
- Try to keep chemicals in their original containers, and keep them well labeled.
- Train employees and subcontractors.
- Employees trained in emergency spill cleanup procedures should be present when dangerous materials or liquid chemicals are unloaded.
- If significant residual materials remain on the ground after construction is complete, properly remove materials and any contaminated soil (See BMP 9). If the area is to be paved, pave as soon as materials are removed to stabilize the soil.

TARGET POLLUTANTS





BMP 5: MATERIAL USE

DESCRIPTION
Prevent or reduce the discharge of pollutants to storm water from material use by using alternative products, minimizing hazardous material use on-site, and training employees and subcontractors.

APPROACH
The following materials are commonly used on construction sites:
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster or other products
- Petroleum products such as fuel, oil, and grease, and
- Other hazardous chemicals such as acids, lime, glues, paints, solvents, and curing compounds.

Use of these materials on-site can pose the following risks:
- Storm water pollution
- Injury to workers or visitors
- Groundwater pollution
- Soil contamination

The following steps should be taken to minimize the risk:
- Use less hazardous, alternative materials as much as possible.
- Minimize use of hazardous materials on-site.
- Use materials only where and when needed to complete the construction activity.
- Follow manufacturer's instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Personnel who use pesticides should be trained in their use.
- Do not over-apply fertilizers, herbicides, and pesticide. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Unless on steep slopes, till fertilizers into the soil rather than hydroseeding. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried off-site by runoff. Do not apply these chemicals just before it rains.
- Train employees and subcontractors in proper material use.

TARGET POLLUTANTS

● Likely to have significant impact ○ Probable Low or Unknown impact

○ Sediment	◒ Nutrients	◒ Toxic Materials
◒ Oil & Grease	◒ Floatable Materials	○ Other Construction Waste



BMP 6: SPILL PREVENTION AND CONTROL

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

The best management practice covers only spill prevention and control. However, BMP 4 (Material Delivery and Storage) and BMP 5 (Material Use), also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMP's in this chapter.

APPROACH

The following steps will help reduce the storm water impacts of leaks and spills:

Define "Significant Spill"

- Different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills.

General Measures

- Hazardous materials and wastes should be stored in covered containers and protected from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.
- Designate responsible individuals.

Cleanup

- Clean up leaks and spills immediately.
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to either a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMP's in this chapter for specific information.

Reporting

- Report significant spills to local agencies, such as the Fire Department. They can assist in clean up.
- Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).

Use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- If maintenance must occur on-site, use a designated area and /or a secondary containment, located away from drainage courses, to prevent the run-on of storm water and the runoff of spills.
- Regularly inspect on-site vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks and employee and subcontractor vehicles) for leaking oil and

fluids. Do not allow leaking vehicles or equipment on-site.

- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place drip pans or absorbent materials under paving equipment when not in use.
- Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.

- Oil filters disposed of in trashcans or dumpsters can leak oil and pollute storm water. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.
- Store cracked batteries in an on-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- If fueling must occur on-site, use designated areas, located away from drainage courses, to prevent the run-on of storm water and the runoff of spills.
- Discourage "topping-off" of fuel tanks; an increase in temperature can cause fuel to expand and overflow.
- Always use secondary containment such as a drain pan to catch when fuel spills/leaks.

TARGET POLLUTANTS

● Likely to have significant impact ○ Probable Low or Unknown impact

○ Sediment	○ Nutrients	◒ Toxic Materials
◒ Oil & Grease	○ Floatable Materials	○ Other Construction Waste



BMP 7: SOLID WASTE MANAGEMENT

DESCRIPTION

Prevent or reduce the discharge or pollutants to storm water from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

APPROACH

Solid waste is one of the major pollutants resulting from construction. Construction debris includes:

- Solid waste generated from trees and shrubs removed during land clearing, demolition or existing structures (rubble), and building construction;
- Packaging materials including wood, paper and plastic;
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products; and
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes.

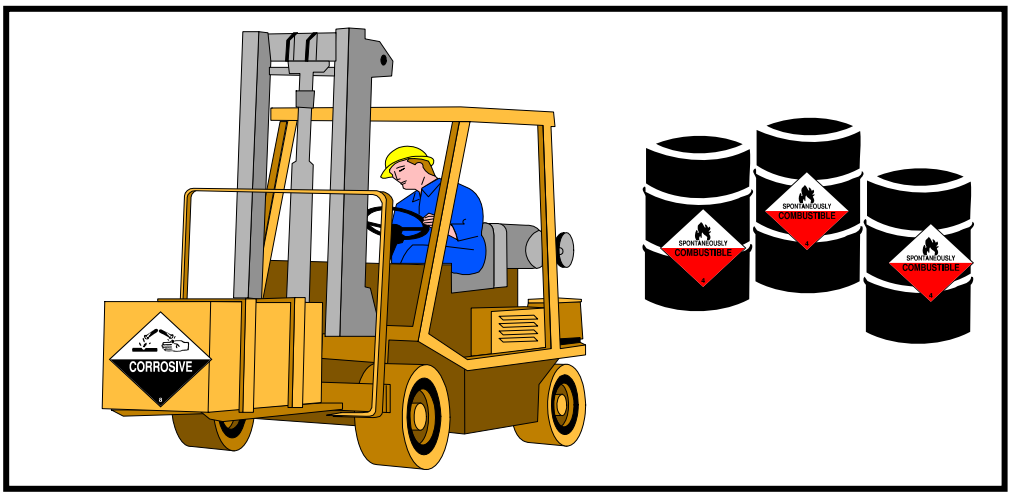
The following steps will help keep a clean site and reduce storm water pollution:

- Select designated waste collection areas on-site.
- Inform trash-hauling contractors that you will accept only watertight dumpsters for on-site use. Inspect dumpsters for leaks and repair any dumpster that is not watertight.
- Locate containers in a covered area and/or in a secondary containment.
- Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it's windy.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Collect site trash daily, especially during raining and windy conditions.
- Erosion and sediment control devices tend to collect litter. Remove this solid waste promptly.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Salvage or recycle any useful material. For example, trees and shrubs from land clearing can be used as a brush barrier, or converted into wood chips, then used as mulch on graded areas.
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to trash hauling contractor.
- Arrange for regular waste collection before containers overflow.
- If a container does spill, clean up immediately.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.
- Train employees and subcontractors in proper solid waste management.
- For a quick reference on disposal alternatives for specific wastes, see Table 5-1.

TARGET POLLUTANTS

● Likely to have significant impact ○ Probable Low or Unknown impact

◒ Sediment	○ Nutrients	○ Toxic Materials
○ Oil & Grease	● Floatable Materials	● Other Construction Waste



BMP 8: HAZARDOUS WASTE MANAGEMENT

DESCRIPTION
Prevent or reduce the discharge of pollutants to storm water from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

APPROACH
Many of the chemicals used on-site can be hazardous materials that become hazardous waste upon disposal. These wastes may include:

- Paints and solvents
- Petroleum products such as oils, fuels, and grease
- Herbicides and pesticides
- Acids for cleaning masonry
- Concrete curing compounds

In addition, sites with existing structures may contain wastes that must be disposed of in accordance with Federal, State, and local regulation. These wastes include:

- Sandblasting grit mixed with lead-, cadmium-, or chromium-based paints;
- Asbestos; and
- PCB's (particularly in older transformers).

The following steps will help reduce storm water pollution from hazardous wastes:

<u>Material Use</u>

- Use the entire product before disposing of the container.
- Do not remove the original product label, it contains important safety and disposal information.
- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instruction. Over-application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried off-site by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with Federal and State regulation.
- Do not clean out brushes or rinse paint containers into the dirt, street, gutter, storm drain, or stream. "Paint out" brushes as much as possible. Rinse water-based paints to the sanitary sewer. Filter and re-use thinners and solvents. Dispose of excess oil-based paint and sludge as hazardous waste.

<u>Waste Recycling/Disposal</u>

- Select designated hazardous waste collection areas on-site.
- Hazardous materials and wastes should be stored in covered containers and protected from vandalism.
- Place hazardous waste containers in secondary containment.
- Do not mix wastes. This can cause chemical reactions, make recycling impossible, and complicate disposal.
- Recycle material such as used oil or water-based paint.

- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Arrange for regular waste collection before containers overflow.
- Make sure that hazardous waste (e.g. excess oil-based paint and sludge) is collected, removed, and disposed of only at an authorized disposal area.
- For a quick reference on disposal alternatives for specific wastes, see Table 5-1.

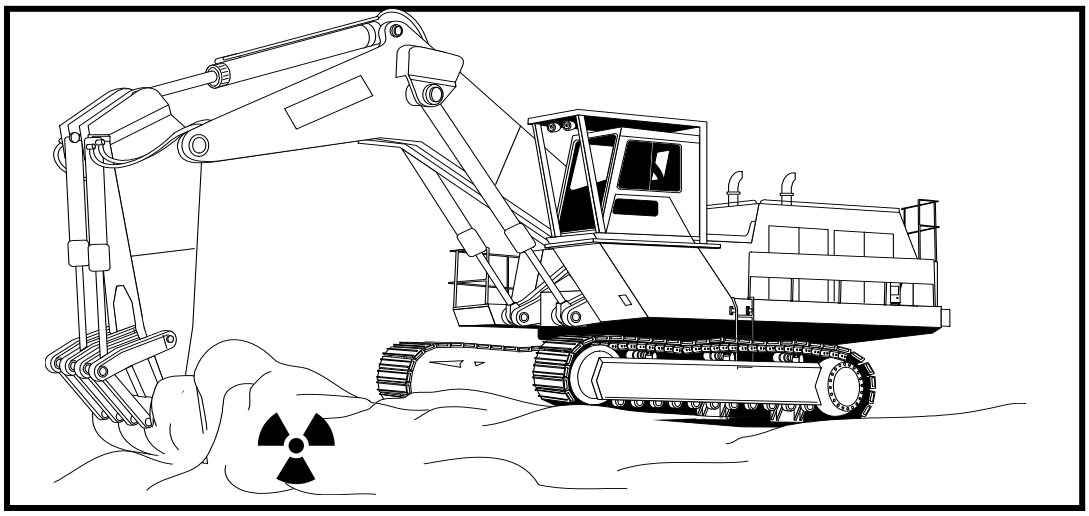
Training

- Train employees and subcontractors in proper hazardous waste management.
- Warning signs should be placed in areas recently treated with chemical.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- If a container does spill, clean up immediately.

TARGET POLLUTANTS

● Likely to have significant impact ○ Probable Low or Unknown impact

○ Sediment	○ Nutrients	◒ Toxic Materials
○ Oil & Grease	○ Floatable Materials	○ Other Construction Waste



BMP 9: CONTAMINATED SOIL MANAGEMENT

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from contaminated soil and highly acidic or alkaline soils by conducting pre-construction surveys, inspecting excavations regularly, and remediating contaminated soil promptly.

APPROACH

Contaminated soils may occur on your site for several reasons including:
- Past site uses and activities;
- Detected or undetected spills and leaks; and
- Acid alkaline solutions from exposed soil or rock formations high in acid or alkaline forming elements.

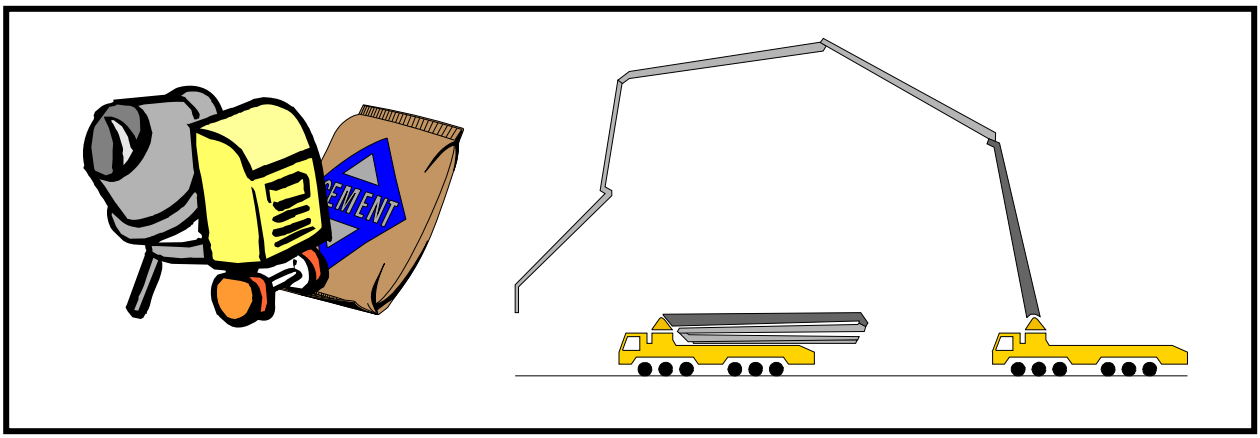
Most developers conduct pre-construction environmental assessments as a matter of routine. Recent court rulings holding contractors liable for cleanup costs when they unknowingly move contaminated soil highlight the need for contractors to confirm that a site assessment is complete before earth moving begins.

The following steps will help reduce storm water pollution for contaminated soil:
- Conduct thorough site planning including pre-construction geologic surveys.
- Look for contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
- Prevent leaks and spills to the maximum extent practicable. Contaminated soil can be expensive to treat and/or dispose of properly. However, addressing the problem before construction is much less expensive than after the structures are in place.
- Test suspected soils at a certified laboratory.
- If the soil is contaminated, work with the local regulatory agencies to develop options for treatment and/or disposal.
- For a quick reference on disposal alternatives for specific wastes, see Table 5-1.

TARGET POLLUTANTS

● Likely to have significant impact ○ Probable Low or Unknown impact

◒ Sediment	○ Nutrients	● Toxic Materials
○ Oil & Grease	○ Floatable Materials	○ Other Construction Waste



BMP 10: CONCRETE WASTE MANAGEMENT

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout off-site, performing on-site washout in a designated area, and training employees and subcontractors.

APPROACH

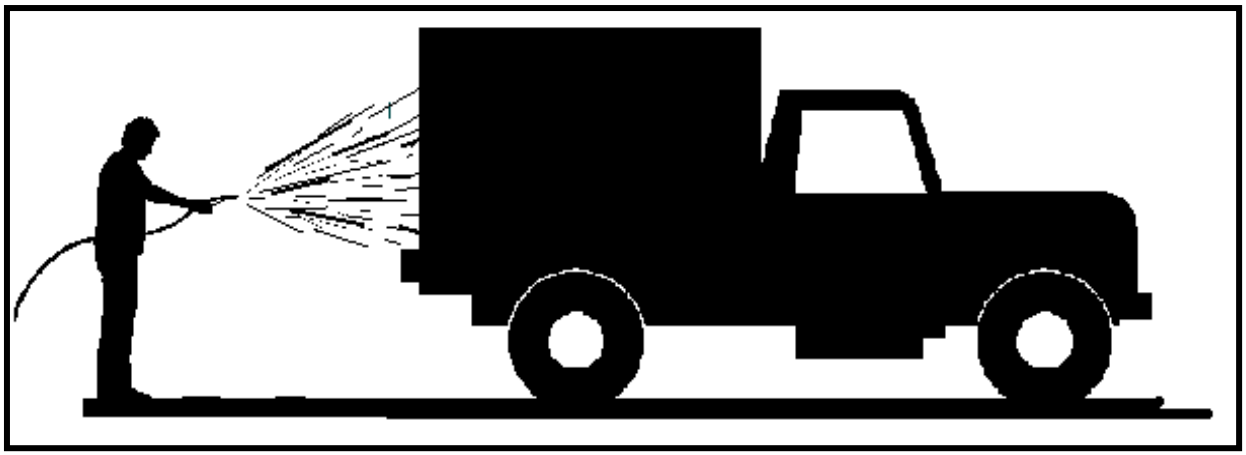
The following steps will help reduce storm water pollution form concrete wastes:

- Store dry and wet materials under cover, away from drainage areas.
- Avoid mixing excess amount of fresh concrete or cement on-site.
- Perform washout of concrete trucks off-site or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated areas.
- For on-site washout:
  - Locate washout area at least 50 feet from storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste;
  - Wash out wastes into the temporary pit where the concrete can be set, be broken up, and then disposed of properly.
- When washing concrete to remove fine particles and expose the aggregate, avoid creating runoff by draining the water to a bermed or level area.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile, or dispose in the trash.
- Train employees and subcontractors in proper concrete waste management.
- For a quick reference on disposal alternatives for specific wastes, see Table 5-1.

TARGET POLLUTANTS

● Likely to have significant impact ○ Probable Low or Unknown impact

◒ Sediment	○ Nutrients	○ Toxic Materials
○ Oil & Grease	○ Floatable Materials	◒ Other Construction Waste



BMP 11: VEHICLE AND EQUIPMENT CLEANING

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from vehicles and equipment by using off-site facilities, washing in designated, contained areas only, eliminating discharges to the storm drain by infiltrating or recycling the wash water, and/or training employees and subcontractors.

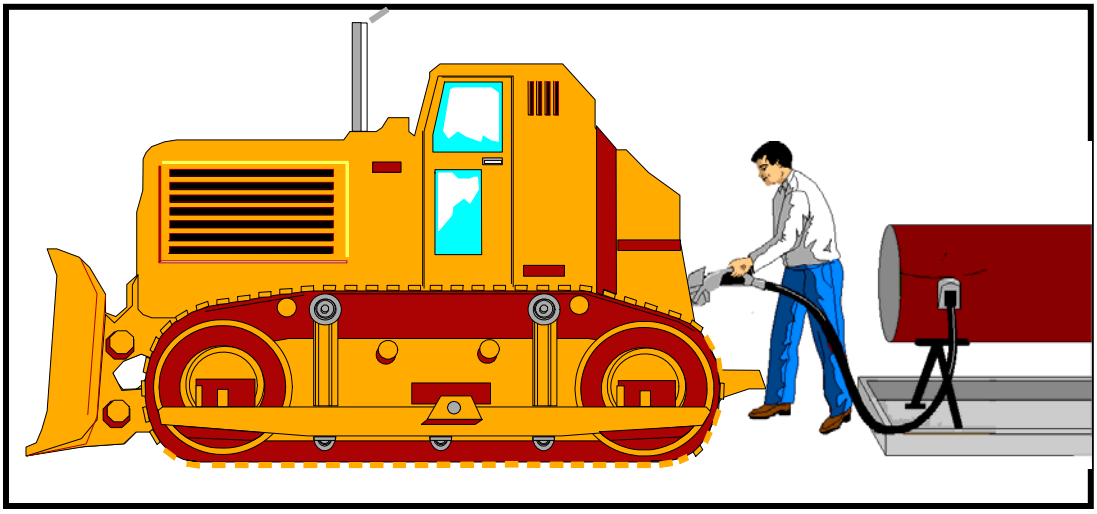
APPROACH

- Use off-site commercial washing business as much as possible. Washing vehicles and equipment outdoors or in areas where wash water flows onto paved surfaces or into drainage pathways can pollute storm water. If you wash a large number of vehicles or pieces of equipment, consider conducting this work at an off-site commercial business. These businesses are better equipped to handle and dispose of the wash waters properly. Performing this work off-site can also be economical by eliminating the need for a separate washing operation at your site.
- If washing must occur on-site, use designated bermed wash areas to prevent wash water contact with storm water, creeks, rivers, and other water bodies. The wash area can be sloped for wash water collection and subsequent infiltration into the ground.
- Use as little water as possible to avoid having to install erosion and sediment control for the wash area.
- Use phosphate-free, biodegradable soaps.
- Educate employees and subcontractors on pollution prevention measures.
- Do not permit steam cleaning on-site. Steam cleaning can generate significant pollutant concentrations.
- For a quick reference on disposal alternatives for specific wastes, see Table 5-1.

TARGET POLLUTANTS

● Likely to have significant impact ○ Probable Low or Unknown impact

◒ Sediment	○ Nutrients	◒ Toxic Materials
◒ Oil & Grease	○ Floatable Materials	○ Other Construction Waste



BMP 12: VEHICLE AND EQUIPMENT FUELING

DESCRIPTION

Prevent fuel spills and leaks, and reduce their impacts to storm water by using off-site facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors.

APPROACH

- Use off-site fueling stations as much as possible. Fueling vehicles and equipment outdoors or in areas where fuel may spill/leak onto paved surfaces or into drainage pathways can pollute storm water. If you fuel a large number of vehicles or pieces of equipment, consider using an off-site fueling station. These businesses are better equipped to handle fuel and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate fueling area at your site.
- If fueling must occur on-site, use designated areas, located away from drainage.
- Discourage "topping-off" of fuel tanks.
- Always use secondary containment, such as a drain pan or drop cloth, when fueling to catch spills/leaks.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Use adsorbent on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Carry out all Federal and State requirements regarding stationary above ground storage tanks.
- Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and perhaps forklifts, most vehicles should be able to travel to a designated area with little lost time.
- Train employees and subcontractors in proper fueling and cleanup procedures.
- For a quick reference on disposal alternatives for specific wastes, see Table 5-1.

TARGET POLLUTANTS

● Likely to have significant impact ○ Probable Low or Unknown impact

○ Sediment	○ Nutrients	◒ Toxic Materials
◒ Oil & Grease	○ Floatable Materials	○ Other Construction Waste



BMP 13: VEHICLE AND EQUIPMENT MAINTENANCE

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from vehicle and equipment maintenance by running a "dry site". This involves using off-site facilities, performing work in designated areas only, providing cover for materials stored outside, checking for leaks and spills, containing and cleaning up spills immediately, and training employees and subcontractors.

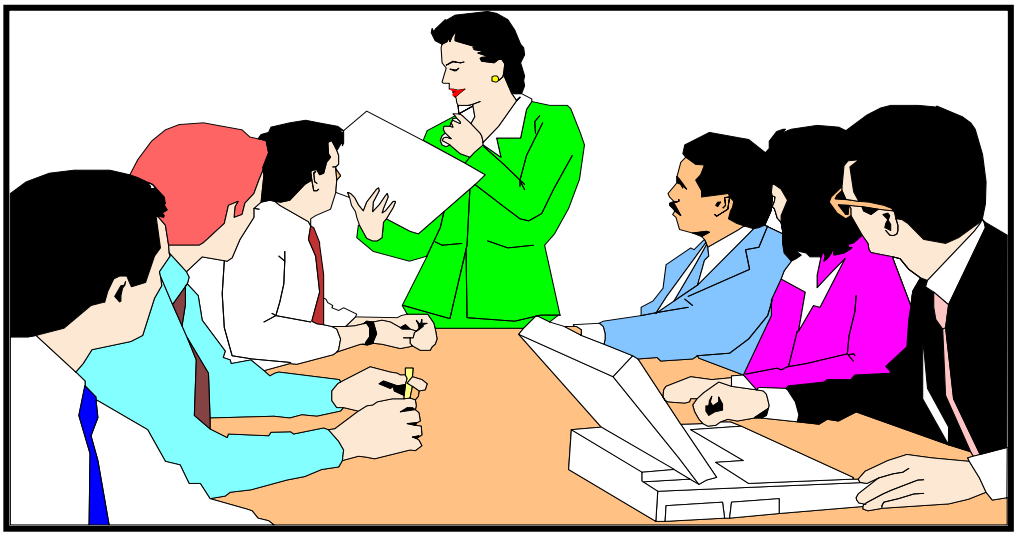
APPROACH

- Keep vehicles and equipment clean; don't allow excessive build-up of oil and grease.
- Use off-site repair shops as much as possible. Maintaining vehicles and equipment outdoors or in areas where vehicles or equipment fluids may spill or leak into the ground can pollute storm water. If you maintain a large number of vehicles or pieces of equipment, consider using an off-site repair shop. These businesses are better equipped to handle vehicle fluids and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate maintenance area.
- If maintenance must occur on-site, use designated areas, located away from drainage courses, to prevent the run-on of storm water and the runoff of spills.
- Always use secondary containment, such as a drain pan or drop cloth, to catch sills or leaks when removing or changing fluids.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Regularly inspect on-site vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site.
- Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic, and transmissions fluids.
- Train employees and subcontractors in proper maintenance and spill cleanup procedures.
- For a quick reference on disposal alternatives for specific wastes, see Table 5-1.

TARGET POLLUTANTS

● Likely to have significant impact ○ Probable Low or Unknown impact

○ Sediment	○ Nutrients	◒ Toxic Materials
◒ Oil & Grease	○ Floatable Materials	○ Other Construction Waste



BMP 14: EMPLOYEE/SUBCONTRACTOR TRAINING

DESCRIPTION

Employee/subcontractor training, like maintenance or a piece of equipment, is not so much a best management practice as it is a method by which to implement BMP's. This fact sheet highlights the importance of training and of integrating the elements of employee/subcontractor training from the individual source controls into a comprehensive training program as part of the Erosion and Sediment Control Plan (ESCP).

The specific employee/subcontractor training aspects of each of the source controls are highlighted in the individual fact sheets. The focus of this fact sheet is more general, and includes the overall objectives and approach for assuring employee/subcontractor training in storm water pollution prevention. Accordingly, the organization of this fact sheet differs from the other fact sheets in the chapter.

OBJECTIVES

Employee/subcontractor training should be based on four objectives:

- Promote a clear identification and understanding of the problem, including activities with the potential to pollute storm water;
- Identify solutions (BMP's);
- Promote employee/subcontractor ownership of the problems and the solutions; and
- Integrate employee/subcontractor feedback into training and BMP implementation.

APPROACH

- Integrate training regarding storm water quality management with existing training programs that may be required by other regulations, the Hazardous Waste Operations and Emergency Response standard (29CFT 1910.120), the Spill Prevention Control and Countermeasure Plan (40CFR 112).
- Train employees/subcontractors in standard operating procedures and spill cleanup techniques described in the Pollution Control Plan. Employee/subcontractors trained in spill containment and cleanup should be present during the loading/unloading and handling of materials.
- Personnel who use pesticides should be trained in their use.
- Educating off-site contractors and subcontractors supports the efforts of well-trained employees.
- Consider posting the quick reference table around the job site or in the on-site office trailer to reinforce training.
- Train employees/subcontractors in standard operating procedures and spill cleanup techniques described in the fact sheets. Employees/subcontractors trained in spill containment and cleanup should be present during the loading/unloading and handling of materials.
- Personnel who use pesticides should be trained in their use. The Oregon Department of Pesticide Regulation and county agricultural commissioner's license pesticide dealers, certify pesticide applicators, and conduct on-site inspections.
- Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employee/subcontractors can be lost by unknowing off-site contractors, so make sure they are well informed about what they are expected to do on-site.

REFERENCES

Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992

Storm Water management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Hot-mix Asphalt Paving Handbook, U.S. Army Corps of Engineers, Ac 150/5370-14, Appendix July 1991

Best Management Practices and Erosion Control Manual for Construction Sites; Flood Control District of Maricopa County, AZ. September 1992

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992

Processes, Procedures, and Methods to Control Pollution Resulting from all Construction Activity; USEPA, 430/0-73-007,1973.

Swisher, R.D., 1987. Surfactants Biodegradation, Marcel Decker Corporation

CHAPTER 6
INSPECTION AND MAINTENANCE

Erosion and sediment control measures are required for the sole purpose of protecting sensitive areas such as: streams, rivers, lakes, and wetlands. Check with local jurisdiction for specific requirements, permits and inspection. Inspection and Maintenance of ESC measures throughout the life of the project are imperative to ensure their performance. Unless the measures are properly installed and maintained, there is a strong chance of failure during the construction period.

6.1 Permittee Site Inspector

Larger more complex construction sites such as: subdivisions, commercial, and highway projects require ongoing, very detailed inspection and maintenance for longer periods of time. For that very reason alone, pre-construction meetings are vital and should be scheduled prior to any clearing, grading, or utility activities. Equally important is who should attend. Along with the inspector and engineer, the contractors grading and utility superintendent should be present.

The owner of the site shall designate a competent person as Permittee Site Inspector (PSI), Inspections must be conducted by a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact stormwater quality, is knowledgeable in the correct installation of the erosion and sediment controls, and is able to assess the effectiveness of any sediment and erosion control measures selected to control the quality of stormwater discharges from the construction activity. The PSI shall be responsible for assuring the implementation of the ESCP and have the authority to immediately mobilize necessary personnel and equipment to correct and modify erosion prevention and sediment controls when required.

Duties of the PSI include:

- Provide name and 24-hour contact information of PSI
- Manage and insure proper implementation of the ESCP.
- Accompany the Agency in a field review of the ESCP prior to the beginning of work.
- *Inspection:*
    - Active Period – Daily when stormwater runoff, including runoff from snowmelt, is occurring.
    - Prior to the site becoming inactive or in anticipation of site inaccessibility – Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
    - Inactive periods greater than seven (7) consecutive calendar days – Once every two (2) weeks.
    - Periods during which the site is inaccessible due to inclement weather – If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.
- Mobilize crews to make immediate repairs to the controls or install controls during working and non-working hours.

- Complete erosion control monitoring forms after each inspection.
- Maintain up to date ESCP throughout the life of the project, available for review upon request.
- Prepare a contingency plan in preparation for emergencies and the rainy season.
- Accompany the Agency on inspections and, if requested, on inspection made by other regulating Agencies.

6.1.1 Ineffective Controls

The PSI shall record measures to clean up significant amounts of sediment. Should a control measure not function effectively, one or more of the following tasks should be performed.

- Immediately repair the control.
- Replace the control.
- Provide additional controls.

6.2 Pre-Construction Meeting

The PSI, contractor and inspector should carefully review the ESCP prior to the pre-construction meeting to understand what is required. Implementing the ESCP and assuring its performance may involve significant expense. The following pre-construction activities should be required.

- Prior to the pre-construction meeting, review and comment of the ESCP.
- During the pre-construction meeting, review all comments and concerns.
- Prohibit clearing and grading operations prior to ESCP approval and implementation.
- Tentatively locate construction accesses.
- Delineate clearing limits, drainage courses, easements, setbacks, wetlands, and other sensitive areas and their buffers.

The pre-construction meeting provides an opportunity for the contractor to discuss the plan with the inspector and learn which elements of the ESCP deserve the most attention. Adjustments to improve performance or make installation easier and maintenance more reliable may also be discussed.

The pre-construction meeting is also an opportunity to discuss the inspection schedule and procedures. Key points to consider in the pre-construction meeting are:

- Pollution Control Plan for contractor operations.
- Qualifications of individuals designated as competent person for ESCP.
- Method to be used to document the up-to-date ESCP.
- Adjacent areas that need special protection from sedimentation, particularly environmentally sensitive areas such as wetlands, stream crossings, channel, and water disposal outlets.
- Discuss drainage aspects of the site (both pre and post construction).
- Location of erosion and sediment control practices and their implementation.
- Sequence of installation with respect to the construction schedule.
- Surface stabilization plans, temporary and permanent seeding.
- Construction schedule and any anticipated shutdown periods.
- Maintenance plans and the contractor’s procedure for monitoring performance.

- Location of all borrow and disposal areas.
- Emergency or contingency plans.
- Any special requirements identified in permits.
- Monitoring form used and availability.
- Biological Assessment – this report comes from the consultant and cover special needs and concerns for threatened and endangered species on the project, the contractor should be aware of its contents.

6.2.1 Modified ESCP

All projects will include a prepared ESCP. This plan may require a registered engineer's approval. This plan is only a guide and is unlikely to have addressed all erosion problems for the project adequately. The ESCP included in the plan set should not be followed blindly. It is the owner or PSI responsibility to propose modifications to the plan.

In addition, effective erosion control is closely tied to a contractor's staging, operation methods and construction timing. When the ESCP is developed the contractor's staging and operation methods are unknown. Therefore, it is expected that changes to the ESCP be updated throughout the life of the project. As modifications to the ESCP take place, it is extremely important to secure the interest of all parties. Communications between the contractor, designated person and inspector is vital.

Depending upon the level of modification, the design engineer is responsible for submitting those changes to the local jurisdiction. Regardless of the magnitude, a contingency plan must be implemented immediately. Minor modifications to the ESCP such as installing small sections of sediment control barriers, can be field adjusted and hand written on the plans. On 1200-C permitted projects, an Action Plan or approved equivalent is required for any change to the approved ESCP. Check with DEQ or DEQ's Local Agent for specific requirements.

6.2.2 Construction Schedule Review

The implementation of the construction schedule should include the following.

- Timing of activities to limit seasonal and weather impacts.
- Timing of wet season work and temporary work shut down.
- Time of activities to meet "in-water" work restrictions.
- Erosion prevention and sediment controls shown on the plans should be installed before ground-disturbing activities begin.
- Permanent facilities, such as sediment traps and basins, which will be used during construction as temporary measures should be installed.
- Retention of temporary perimeter controls until all upstream areas are finally stabilized.
- Timing of soil stabilization such as seeding, planting, etc.

6.2.3 Monitoring Form

On all development sites inspections are to be recorded and readily available. The effectiveness of each BMP at every location on site should be documented on the form, and general observations on site conditions should also be recorded. Information provided on the form is

useful for tracking repairs and demonstrating permit compliance. It is noteworthy that in the event of permit violations or subsequent enforcement actions, the information recorded on the form, along with photographs and videos, may be used to evaluate the responsibility of involved parties.

6.3 Materials (Qualified Products List)

The purpose of this manual is to provide cost effective, environmentally sensitive management of erosion through a qualified products list (QPL). This manual illustrates materials that have been approved based on geographical controls such as, climate and soil type. In addition, approvals of all materials listed on a QPL were field tested through demonstration projects and reviewed for their performance. New materials not listed in this manual will be approved based on equal to or greater then criteria.

6.4 Installation

It must be understood that installation is equally important to the value and success of the materials. If installed incorrectly, even the best materials will fail causing more damage and additional expense to the project. For this reason alone, installation procedures should be followed very closely.

Installation of all base measures shall be inspected by Permittee Site Inspector and any deficiencies corrected prior to the start of land disturbing activities. Subsequent inspections of any additional installations should also be made throughout the life of the project as needed. Base measures may also be required to be inspected by the local jurisdiction with erosion control authority.

The inspector, contractor or PSI should be familiar with installations details for each BMP used on the project. Details for the installation of all specified BMP's should be provided in the ESCP. Installation details for BMP's are also provided in Chapter 4 of this manual.

6.5 Inspection Requirements

The owner or designated person (PSI) shall be required to provide ongoing inspection of erosion and sediment control measures throughout the life of the project. Inspections shall be recorded on an approved monitoring form.

Minimum inspection requirements shall be as follows:

- **Active Period –** Daily when stormwater runoff, including runoff from snowmelt, is occurring.
- **Prior to the site becoming inactive or in anticipation of site inaccessibility –** Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
- **Inactive periods greater than seven (7) consecutive calendar days –** Once every two (2) weeks.

- **Periods during which the site is inaccessible due to inclement weather –** If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.

6.5.1 Inspection of Work Restriction Areas

All construction projects are required to restrict certain types of work, which may contribute to sediment-laden water leaving the project boundaries or entering waterways. The following work restrictions need to be inspected prior to the start of work and throughout the life of the project.

1) **Flag Clearing Limits:** Construction site clearing limits will be clearly flagged in accordance with the approved plans. No ground disturbance is permitted beyond the flagged boundary. Flagging should be maintained for the duration of construction.
2) **Perimeter Controls before Grubbing:** all appropriate perimeter controls should be installed prior to any major site grubbing operation. Perimeter controls include interceptor ditches, berms infill areas, and sediment fences along the banks of existing streams and toes of slopes.
3) **Wet Season Plan and Schedule:** Prior to wet season construction work and before temporary work suspension for winter, the contractor, or designated person should meet with the Agency to review and update the ESCP and to develop a schedule to assure that appropriate controls are implemented and maintained during the wet season work and suspended periods.
4) **Limit Disturbed Areas:** If soil erosion and sediment resulting from construction activities is not effectively controlled, the Agency will limit the amount of disturbed areas that can be effectively controlled.
5) **Install BMP's Early:** Erosion and sediment control features should be incorporated into the projects at the earliest practicable time. All erosion and sediment control measures should be installed according to the approved implementation schedule and with these specifications.
6) **Stop Work:** Failure to control erosion and or pollution shall be cause for the Agency to stop all construction work until measures have been taken to bring all construction into compliance with these specifications.

6.6 Stabilization Requirements

All soils that are exposed and disturbed by construction-related activities should be stabilized according to the following time frames.

- All seeding applications must be completed and established prior to wet weather season
- Wet weather season – October 1st through May 31st
- Soils exposed during wet weather season as a result of construction must be covered at the end of each day

6.7 Erosion Control Contingency Items

It is a requirement that all construction sites have materials on hand as a contingency in the event of a failure or when required to shore up BMP's installed as part of the ESCP.

The contingency items may also be used at the discretion of the project inspector to strengthen the erosion control measures as needed during construction.

The following are examples of materials to be kept on the project site for use in emergencies.

- 100 ft of sediment fence
- 260 sq. ft. or plastic sheeting
- 1,000 ft of rope
- 50 empty sand bags (to be filled as needed)
- 10 bales of straw (used for ground cover)
- 10 bio-filter bags with stakes

6.8 Maintenance

Erosion and sediment controls must be maintained in good working order at all times in order to function as intended. These controls must be maintained in place until the Agency issues notification of acceptance of permanent stabilization.

Typical maintenance activities, guidelines and failure modes for BMP's are discussed in Chapter 4 of this manual. The inspector should be familiar with maintenance requirements for each BMP used on the project. It is noteworthy that maintenance activities and frequencies vary among the different BMP's and will depend largely on weather and other site conditions. In general, the more effective erosion prevention measures are, the less maintenance will be required for sediment controls.

6.8.1 Sediment Removal

Sediment shall be removed and the controls upgraded or repaired as outlined in Chapter 4 BMP maintenance, or as directed. In the event of continuous rainfall over a 24-hour period, or other circumstances that preclude equipment operation in that area, additional
sediment control shall be hand-carried and installed in accordance with best management practices and as approved by the Agency. Sediment shall be removed from controls such as sediment fences, sediment barriers, check dams, inlet protection, and sediment traps when the sediment buildup has reached 1/3 the exposed height of the control or storage depth. Rock filters and filter berm material shall be replaced with new rock material when sediment reduces the filtering capacity by 50 percent. Rock or other material specified shall be added or removed as needed to maintain proper function of the entrance areas. All paved areas shall be kept clean (by mechanical means) for the duration of the project.

6.8.2 Sediment Disposal

Removed sediment shall be placed in a non-erodible area within the construction site, or removed and disposed of off site in accordance with all federal, state, and local laws and ordinances. Sediment-laden water shall not be flushed into the storm water system.

6.9 Inspection Checklist

The sample Inspection Checklist included in Appendix B may be used by Agency representatives when inspecting erosion and sediment controls on a project site. The checklist is intended to summarize the key elements of a successful erosion and sediment control program. Topics on the checklist include:

- Schedule Review
- Erosion and Sediment Control Plan
- Erosion and Pollution Control Manager
- Sensitive Areas
- Contingency Plans
- Materials On-Hand
- Maintenance
- Monitoring Forms
- Slope Protection and Stabilization
- Plan Revisions and Modifications
- BMP Evaluation
- Additional Items

6.9.1 Winterization

The wet weather period is October 1 through May 31. Prior to wet weather period work and before consideration of work suspension for winter, the contractor should meet with the Agency to review and update the ESCP and to develop a schedule to assure that appropriate controls are implemented and maintained during wet season and during any possible work suspension periods. Winter preparations should begin several weeks prior to wet weather season. Refer to Chapter Four for information on common best management practices.

6.9.2 Designer/Inspector Tool Box

Several worksheets are provided in Appendix C to aid designers and inspectors in determining and verifying the quality and quantity of various erosion control items. These are especially useful when verifying the application rates of various mulch and hydraulically applied products. Appendix C includes the following.

- Slope Inclination Conversions
- Metric Conversions Table
- Straw Mulch Application Worksheet
- Hydraulic Application Equations
- Wood Fiber Mulch Hydraulic Application Worksheet
- Seed / Fertilizer Hydraulic Application Worksheet
- Hydraulic Application Example Problems

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GRADING & EROSION CONTROL INFORMATION

GENERAL CONTRACTOR Name:_____ Address:_____ _____ Phone #: _____	**CONSTRUCTION ACTIVITY** Project #: _____ Project Name:_____
EXCAVATION CONTRACTOR Name:_____ Address:_____ _____ Phone #: _____	**SITE ADDRESS** Nearest Cross Streets: _____
OWNER/APPLICANT Name:_____ Address:_____ _____ Phone #: _____	**DRAINAGE / WATERWAY** Name of nearest stream, creek, river: _____
24-HOUR EMERGENCY CONTACT Name:_____ Address:_____ _____ Phone #: _____	**SOIL DISPOSAL** Exporting Soil ? Y N Address of Site:_____

I agree to comply with the "Erosion Prevention and Sediment Control Planning and Design Manual" and will construct and maintain ESC measures to contain Sediment on the construction site.

_____ _____

Owner/Applicant Signature **Date**

STANDARD EROSION AND SEDIMENT CONTROL PLAN DRAWING NOTES;

1. WHEN RAINFALL AND RUNOFF OCCURS DAILY INSPECTIONS OF THE EROSION AND SEDIMENT CONTROLS AND DISCHARGE OUTFALLS MUST BE PROVIDED BY SOME ONE KNOWLEDGEABLE AND EXPERIENCED IN THE PRINCIPLES, PRACTICES, INSTALLATION, AND MAINTENANCE OF EROSION AND SEDIMENT CONTROLS WHO WORKS FOR THE PERMITTEE.

2. CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND CREATION OF BARE GROUND FROM OCTOBER 1 THROUGH MAY 31 EACH YEAR.

3. DURING WET WEATHER PERIOD, TEMPORARY STABILIZATION OF THE SITE MUST OCCUR AT THE END OF EACH WORK DAY.

4. SEDIMENT CONTROLS MUST BE INSTALLED AND MAINTAINED ON ALL DOWN GRADIENT SIDES OF THE CONSTRUCTION SITE AT ALL TIMES DURING CONSTRUCTION. THEY MUST REMAIN IN PLACE UNTIL PERMANENT VEGETATION OR OTHER PERMANENT COVERING OF EXPOSED SOIL IS ESTABLISHED.

5. ALL ACTIVE INLETS MUST HAVE SEDIMENT CONTROLS INSTALLED AND MAINTAINED AT ALL TIMES DURING CONSTRUCTION. UNLESS OTHERWISE APPROVED, A SURFACE MOUNTED AND ATTACHABLE, U-SHAPED FILTER BAG IS REQUIRED FOR ALL CURB INLET CATCH BASINS.

6. SIGNIFICANT AMOUNTS OF SEDIMENT WHICH LEAVES THE SITE MUST BE CLEANED UP WITHIN 24 HOURS AND PLACED BACK ON THE SITE AND STABILIZED OR PROPERLY DISPOSED. THE CAUSE OF THE SEDIMENT RELEASE MUST BE FOUND AND PREVENTED FROM CAUSING A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN UP OF SEDIMENT SHALL BE PREFORMED ACCORDING TO THE OREGON DEPARTMENT OF STATE LANDS REQUIRED TIME FRAME.

7. SEDIMENT MUST NOT BE INTENTIONALLY WASHED INTO STORM SEWERS, DRAINAGE WAYS, OR WATER BODIES.

8. SEDIMENT MUST BE REMOVED FROM BEHIND ALL SEDIMENT CONTROL MEASURES WHEN IT HAS REACHED A HEIGHT OF 1/3RD THE BARRIER HEIGHT, AND PRIOR TO THE CONTROL MEASURES REMOVAL.

9. CLEANING OF ALL STRUCTURES WITH SUMPS MUST OCCUR WHEN THE SEDIMENT RETENTION CAPACITY HAS BEEN REDUCED BY 50% AND AT COMPLETION OF PROJECT.

10. ANY USE OF TOXIC OR OTHER HAZARDOUS MATERIALS MUST INCLUDE PROPER STORAGE, APPLICATION, AND DISPOSAL.

11. THE PERMITTEE MUST PROPERLY MANAGE HAZARDOUS WASTES, USED OILS, CONTAMINATED SOILS, CONCRETE WASTE, SANITARY WASTE, LIQUID WASTE, OR OTHER TOXIC SUBSTANCES DISCOVERED OR GENERATED DURING CONSTRUCTION.

12. THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS. NUTRIENT RELEASES FROM FERTILIZERS TO SURFACE WATERS MUST BE MINIMIZED. TIME RELEASE FERTILIZERS SHOULD BE USED AND CARE SHOULD BE MADE IN APPLICATION OF FERTILIZERS WITHIN ANY WATER WAY RIPARIAN ZONE.

13. OWNER OR DESIGNATED PERSON SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH CURRENT CLEAN WATER SERVICES STANDARDS AND STATE, AND FEDERAL REGULATIONS.

14. PRIOR TO ANY LAND DISTURBING ACTIVITIES, THE BOUNDARIES OF THE CLEARING LIMITS, VEGETATED BUFFERS, AND ANY SENSITIVE AREAS SHOWN ON THIS PLAN SHALL BE CLEARLY DELINEATED IN THE FIELD. UNLESS OTHERWISE APPROVED, NO DISTURBANCE IS PERMITTED BEYOND THE CLEARING LIMITS. THE OWNER/PERMITTEE MUST MAINTAIN THE DELINEATION FOR THE DURATION OF THE PROJECT.
    NOTE: VEGETATED CORRIDORS TO BE DELINEATED WITH ORANGE CONSTRUCTION FENCE OR APPROVED EQUAL.

15. PRIOR TO ANY LAND DISTURBING ACTIVITIES, THE BMPS THAT MUST BE INSTALLED ARE GRAVEL CONSTRUCTION ENTRANCE, PERIMETER SEDIMENT CONTROL, AND INLET PROTECTION. THESE BMPS MUST BE MAINTAINED FOR THE DURATION OF THE PROJECT.

16. IF VEGETATIVE SEED MIXES ARE SPECIFIED, SEEDING MUST TAKE PLACE NO LATER THAN SEPTEMBER 1ST; THE TYPE AND PERCENTAGES OF SEED IN THE MIX ARE AS IDENTIFIED ON THE PLANS OR AS SPECIFIED BY THE DESIGN ENGINEER.

17. WATER-TIGHT TRUCKS MUST BE USED TO TRANSPORT SATURATED SOILS FROM THE CONSTRUCTION SITE. AN APPROVED EQUIVALENT IS TO DRAIN THE SOIL ON SITE AT A DESIGNATED LOCATION USING APPROPRIATE BMPS; SOIL MUST BE DRAINED SUFFICIENTLY FOR MINIMAL SPILLAGE.

18. ALL PUMPING OF SEDIMENT LADEN WATER MUST BE DISCHARGED OVER AN UNDISTURBED, PREFERABLY VEGETATED AREA, AND THROUGH A SEDIMENT CONTROL BMP (I.E. FILTER BAG).

19. THE ESC PLAN MUST BE KEPT ONSITE. ALL MEASURES SHOWN ON THE PLAN MUST BE INSTALLED PROPERLY TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER A SURFACE WATER SYSTEM, ROADWAY, OR OTHER PROPERTIES.

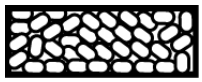
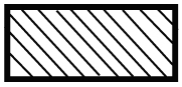
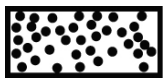
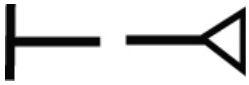
20. THE ESC MEASURES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE MEASURES SHALL BE UPGRADED AS NEEDED TO MAINTAIN COMPLIANCE WITH ALL REGULATIONS.

21. WRITTEN ESC LOGS ARE SUGGESTED TO BE MAINTAINED ONSITE AND AVAILABLE TO DISTRICT INSPECTORS UPON REQUEST.

22. IN AREAS SUBJECT TO WIND EROSION, APPROPRIATE BMPS MUST BE USED WHICH MAY INCLUDE THE APPLICATION OF FINE WATER SPRAYING, PLASTIC SHEETING, MULCHING, OR OTHER APPROVED MEASURES.

23. ALL EXPOSED SOILS MUST BE COVERED DURING WET WEATHER PERIOD.

Erosion Prevention and Sediment Control Symbols

	**Brush Barrier**
	**Check Dam**
	**Compost Blanket**
	**Construction Entrance**
	**Diversion Dike**
	**Diversion Swale**
	**Diversion Dike/Swale**
	**Erosion Control Matting**
	**Filter Berm**
	**Inlet Protection**
	**Outlet Protection**
	**Sediment Barrier**
	**Sediment Fence**
	**Sediment Mat**
	**Sediment Trap**
	**Seeding & Mulching**
	**Temporary Slope Drains**

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Erosion Control Inspection Log

Project Name: _____

Date:_____ Time:_____ Weather:_____ Rainfall In the Last 24 Hours: Yes _____ No _____

Site Active: Yes_____ No_____ Days Since Last Inspection: _____

Inspection Type: Initial Inspection _____ Regular Inspection_____ Final _____ Active Storm Water Runoff_____ Other_____

Observations: _____

_____

_____

_____(More Space on Back)

Corrective Actions Taken/Needed: _____

_____

_____

_____(More Space on Back)

Have Any Changes Been Made to the ESCP: Yes____ No____

If Yes, What Changes Have Been Made: _____

_____

Have The Changes Been Documented: Red Lines: Yes_____ No_____ Action Plan: Yes_____ No_____

Inspected By: Print Name:_____ Title: _____

Signature:_____

Additional Comment Space on Back

Observations: (Continued)

Corrective Actions Taken/Needed: (Continued)

INSPECTION CHECKLIST
FOR
EROSION CONTROL

- **SCHEDULE**

  Have you looked at the Contractors Schedule and determined any conflicts?
  - ✓ Install necessary Best Management Practices (BMP's) prior to any earthwork beginning.
  - ✓ Are earthwork operations being performed in wet weather season with soils that are highly erosive?
  - ✓ Grubbing of areas that will be worked on much later should be delayed
  - ✓ Staging of project may require staging of erosion control measures
  - ✓ Is seeding scheduled before the end of the seed dates?
  - ✓ Are there "In-Stream work areas that may alter contractor's schedule?
  - ✓ When will the contractor remove BMP's?

- **EROSION AND SEDIMENT CONTROL PLAN (ESCP)**
  - ✓ Walk project during preliminary or advanced plan review and look for potential erosion problems
  - ✓ Have you reviewed the Contractor's Erosion Control Plan to determine if it is adequate or makes sense? The ESCP included in the bid package may need modifications to address site conditions or staging
  - ✓ Walk project with PSI prior to any earthwork looking for needed modifications of ESCP
  - ✓ Is the ESCP being kept up-to-date?
  - ✓ Is the ESCP kept on-site? Where?
  - ✓ What is contractor's erosion control plan for offsite borrow sources and waste areas?

- **EROSION AND SEDIMENT CONTROL MANAGER (PSI)**

  Have you met and talked with the person identified as the PSI?
  - ✓ Do you believe this person has adequate knowledge to perform this work?
  - ✓ Does this person understand all the required duties of the PSI?
  - ✓ Does this person have the authority to direct resources and make changes in an emergency situation?

- **SENSITIVE AREAS**

  Are there sensitive areas, which require "extra" attention?
  - ✓ Have they been adequately addressed on the ESCP?
  - ✓ Will these sensitive areas require more monitoring?

- **CONTINGENCY PLAN**
  - ✓ Is there a contingency plan for unexpected events?
  - ✓ What is the plan for stabilization of earthwork performed after seeding dates?

- **MATERIALS ON-HAND**

  It may be difficult to get Erosion Control materials in the middle of the wet season. It is easier to deal with erosion before it happens rather than after.
  - ✓ Does the Contractor have adequate materials on hand to cover each phase of work they plan on performing?

- **MAINTENANCE**
  - ✓ Consider access for maintenance of BMP's. Place where they are easy to maintain if you have a choice
  - ✓ Are installed erosion and sediment controls in good working order?
  - ✓ Are catch basins cleaned out when more than 6 inches of sediment depth accumulates?
  - ✓ At sediment fences, barriers, check dams, inlet protection cleaned out when sediment reaches 1/3 of the storage depth?
  - ✓ Are construction entrances maintained with fresh rock to prevent tracking of sediment onto pavement?

- **MONITORING FORMS**
  - ✓ Are you getting Erosion Control Weekly reports as often as they should be filed from the PSI?
  - ✓ Are the forms complete and adequately represent site conditions and work performed?
  - ✓ Are forms on-site with the "Up-to-Date Plan"?

- **SLOPE PROTECTION & STABILIZATION**
  - ✓ All highly sensitive areas
  - ✓ Permanently finish slopes from top down and seed as you go!
  - ✓ Track walk slopes to provide loosened soil and hold seed
  - ✓ Temporarily stabilize unfinished earthwork scheduled for re-disturbance at a later date (i.e. straw mulch, chemical soil stabilizers, plastic sheeting, matting, etc.)

- **PLANS ARE ONLY A GUIDE**
  What's best for your project is what works on your project. No designer can sit in an office and determine what works on your project. It may require trial and error. The plans are a toolbox with available tools. You may have to create and modify these tools to satisfy the conditions

- **IT'S NOT WORKING!!!**
  Are the BMP's working? If not, are the facilities attempting to prevent erosion before it starts?

- **ADDITIONAL ITEMS**
  - ✓ Go back to newly installed BMP's to check their performance
  - ✓ How will contractor handle dust control or wind erosion?
  - ✓ Will snow melt change runoff and drainage patterns?

Metric Conversion Tables

Measurement in:	From English Units:	To Metric Units:	Multiply By
Length	inch (in)	millimeter (mm)	25.40
	foot (ft)	meter (mm)	0.3048
	yard (yd)	meter (mm)	0.9144
	mile (mi)	kilometer (km)	1.609
Area	in^2	mm^2	645.2
	ft^2	m^2	0.0929
	yd^2	m^2	0.8361
	mi^2	km^2	2.590
	acre	hectare (ha)	0.4047
	acre	m^2	4047

Quantity	From SI Units	To English Units	Divide By
Length	km	mile	1.609
	m	yard	0.9144*
	m	foot	0.3048*
	mm	inch	25.4*
Area	km^2	square mile	2.59
	m^2	acre	4047
	hectare	acre	0.404
	m^2	square yard	0.836
	m^2	square foot	0.092
	mm^2	square inch	645.2

Abbreviations

L	liter
ha	hectares
kg	Kilogram=1x103 grams
m	meter
km	kilometer=1x103 meters

SLOPE CONVERSION TABLE

Rise:Run	% Grade	Angle Degree
1:00	1.0	0.6
1:90	1.1	0.6
1:80	1.3	0.7
1:70	1.4	0.8
1:60	1.7	1.0
1:50	2.0	1.1
1:40	2.5	1.4
1:35	2.9	1.6
1:30	3.3	1.9
1:25	4.0	2.3
1:20	5.0	2.9
1:19	5.3	3.0
1:18	5.6	3.2
1:17	5.9	3.4
1:16	6.3	3.6
1:15	6.7	3.8
1:14	7.1	4.1
1:13	7.7	4.4
1:12	8.3	4.8
1:11	9.1	5.2
1:10	10.0	5.7
1:9	11.1	6.3
1:8	12.5	7.1
1:7	14.3	8.1
1:6	16.7	9.5
1:5	20.O	11.3
1:4	25.0	14.0
1:3	33.3	18.4
1:2	50.0	26.6
1:1	100.0	45.0

How to calculate Slope: Rise or (v) vertical change elevation (feet)
Run or (h) horizontal distance (feet)

Example: Divide rise by run to get your calculated slope %

15v
50h *** Divide 15v by 50h to get .30 or 30%**

Table A-1

Seed or Fertilizer Hydraulic Application

Application Load	Area of Coverage (A)													
	Application Rates of Pure Live Seed (R_{sf})													
(W_{sf})	20 lb/acre		40 lb/acre		60 lb/acre		80 lb/acre		100 lb/acre		200 lb/acre		400 lb/acre	
Pounds	acre	$ft.^2$	acre	$ft.^2$	acre	$ft.^2$	acre	$ft.^2$	acre	$ft.^2$	acre	$ft.^2$	acre	$ft.^2$
10	0.50	21,780	0.25	10,890	0.17	7,260	0.13	5,445	0.10	4,356	0.05	2,178	0.03	1,089
20	1.00	43,560	0.50	21,780	0.33	14,520	0.25	10,890	0.20	8,712	0.10	4,356	0.05	2,178
30	1.50	65,340	0.75	32,670	0.50	21,780	0.38	16,335	0.30	13,068	0.15	6,534	0.08	3,267
40	2.00	87,120	1.00	43,560	0.67	29,040	0.50	21,780	0.40	17,424	0.20	8,712	0.10	4,356
50	2.50	108,900	1.25	54,450	0.83	36,300	0.63	27,225	0.50	21,780	0.25	10,890	0.13	5,445
60	3.00	130,680	1.50	65,340	1.00	43,560	0.75	32,670	0.60	26,136	0.30	13,068	0.15	6,534
70	3.50	152,460	1.75	76,230	1.17	50,820	0.88	38,115	0.70	30,492	0.35	15,246	0.18	7,623
80	4.00	174,240	2.00	87,120	1.33	58,080	1.00	43,560	0.80	34,848	0.40	17,424	0.20	8,712
90	4.50	196,020	2.25	98,010	1.50	65,340	1.13	49,005	0.90	39,204	0.45	19,602	0.23	9,801
100	5.00	217,800	2.50	108,900	1.67	72,600	1.25	54,450	1.00	43,560	0.50	21,780	0.25	10,890
120	6.00	261,360	3.00	130,680	2.00	87,120	1.50	65,340	1.20	52,272	0.60	26,136	0.30	13,068
140	7.00	304,920	3.50	152,460	2.33	101,640	1.75	76,230	1.40	609,984	0.70	30,492	0.35	15,246
160	8.00	348,480	4.00	174,240	2.67	116,160	2.00	87,120	1.60	69,696	0.80	34,848	0.40	17,424
180	9.00	392,040	4.50	196,020	3.00	130,680	2.25	98,010	1.80	78,408	0.90	39,204	0.45	19,602
200	10.00	435,600	5.00	217,800	3.33	145,200	2.50	108,900	2.00	87,120	1.00	43,560	0.50	21,780
220	11.00	479,160	5.50	239,580	3.67	159,720	2.75	119,790	2.20	95,832	1.10	47,916	0.55	23,958
240	12.00	522,720	6.00	261,360	4.00	174,240	3.00	130,680	2.40	104,544	1.20	52,272	0.60	26,136
260	13.00	566,280	6.50	283,140	4.33	188,760	3.25	141,570	2.60	113,256	1.30	56,628	0.65	28,314
280	14.00	609,840	7.00	304,920	4.67	203,280	3.50	152,460	2.80	121,968	1.40	60,984	0.70	30,492
300	15.00	653,400	7.50	326,700	5.00	217,800	3.75	163,350	3.00	130,680	1.50	65,360	0.75	32,670

"Application Load" is in Pure Live Seed.

Gross weight of seed can be converted by the Pure Live Seed (PLS) Rate [%Purity x % Germination = %PLS; Wsf = Gross Weight x %PLS]

To evaluate mulch tracer material, use Table C-1.

Wood Fiber Mulch Hydraulic Application

Table C-1	2,000lb/acre Application Rate (R_{wf})			
Wood Fiber	Water Required for Application		Area of Coverage (A)	
(W_{wf})	Average (V_{wa})	Maximum (V_{wm})		
	40 lbs mulch / 100gal water	50lbs mulch / 100gal water		
Pounds	*Gallons	*Gallons	ft²	Acres
500	1,250	1,000	10,890	0.25
600	1,500	1,200	13,068	0.30
700	1,750	1,400	15,246	0.35
800	2,000	1,600	17,424	0.40
900	2,250	1,800	19,602	0.45
1,000	2,500	2,000	21,780	0.50
1,100	2,750	2,200	23,958	0.55
1,200	3,000	2,400	26,136	0.60
1,300	---	2,600	28,314	0.65
1,400	---	2,800	30,492	0.70
1,500	---	3,000	32,670	0.75

Table C-2	2,500lb/acre Application Rate (R_{wf})			
Wood Fiber	Water Required for Application		Area of Coverage (A)	
(W_{wf})	Average (V_{wa})	Maximum (V_{wm})		
	40 lbs mulch / 100gal water	50lbs mulch / 100gal water		
Pounds	*Gallons	*Gallons	ft²	Acres
500	1,250	1,000	8,712	0.20
600	1,500	1,200	10,454	0.24
700	1,750	1,400	12,197	0.28
800	2,000	1,600	13,939	0.32
900	2,250	1,800	15,682	0.36
1,000	2,500	2,000	17,424	0.40
1,100	2,750	2,200	19,166	0.44
1,200	3,000	2,400	20,909	0.48
1,300	---	2,600	22,651	0.52
1,400	---	2,800	24,394	0.56
1,500	---	3,000	26,136	0.60

* Largest Typical Hydro seeding equipment has a 3,000 gallon working volume.

HYDRAULIC APPLICATION

Wood Fiber Mulch Hydraulic Application

Average Water Required for Application

V_{wa} (gal) = (W_{wf}) / (40lbs mulch / 100gal water)

Maximum Water Required for Application

V_{wm} (gal) = (W_{wf}) / (50lbs mulch / 100gal water)

Area of Coverage

A (acre) = (W_{wf} / R_{wf})

A (ft^2) = (W_{wf} / R_{wf}) * (43,560 ft^2/acre)

Wood Fiber Application Rate (lb/acre)	R_{wf}
Weight or Mass of Wood Fiber (lbs)	W_{wf}
Average Water Requirement (gal)	V_{wa}
Maximum Water Requirement (gal)	V_{wm}
Area of Coverage (ft^2) & (acres)	A

Seed or Fertilizer Hydraulic Application

Area of Coverage

A (acre) = (W_{sf} / R_{sf})

A (ft^2) = (W_{sf} / R_{sf}) * (43,560 ft^2/acre)

Seed or Fertilizer Application Rates (lb/acre)	R_{sf}
Weight or Mass of Seed or Fertilizer (lbs)	W_{sf}
Area of Coverage (ft^2) & (acres)	A

Example #1 (Mulch - Area of Coverage)

Given: Required mulch application rate 2,000 lb/acre.
Hydro Seeder with 1,800 gal working capacity.
900 lbs of Wood Fiber to be applied over seeded area.

Find: Range of Area of Coverage.

Answer: Find the 2,000 lb/acre Application Rate Chart, Table C-3.

Using a 50 lbs / 100 gal mulch/water ratio:
Find 1,800 gal in the Maximum Water Required for Application column.
Follow this row over to the area columns.
One tank can cover **0.45 acre (19,602 ft^2).**

Using a 40 lbs / 100 gal mulch/water ratio:
Find 1,800 gal in the Average Water Required for Application column.
There isn't an 1,800 gal row, so interpolate between 1,750 gal and 2,000 gal.
Follow the 1,750 gal and 2,000 gal row over to the area columns.
At 1,750 gal, one tank can cover 0.35 acre (15,246 ft^2).
At 2,000 gal, one tank can cover 0.40 acre (17,424 ft^2).
One tank can cover 1,800 lb * ((0.40 acre - 0.35 acre)/(2,000 gal - 1,750 gal))
0.36 acre (15,682 ft^2).

Example #2 (Mulch - Materials Used)

Given: 0.60 acre (26,136 ft^2) area to be seeded.
Required mulch application rate 1,200 lb/acre.
Hydro Seeder with 2,500 gal working capacity.

Find: A) Amount of Mulch Required in lbs.
B) Range of Water Required in gal.
C) Number of Trips Required.

Answer: Find the 2,000 lb/acre Application Rate Chart, Table C-3.

A) Find 0.60 acre under the Area of Coverage column.
Follow the row over to the Wood Fiber column.
The wood fiber required by the area is **1,200 lb.**

B) Find 0.60 acre under the Area of Coverage column.
Follow the row to the Required Water for Application column.
Using a 50 lbs / 100 gal mulch/water ratio:
The water required for the area is **2,400 gal.**
Using a 40 lbs / 100 gal mulch/water ratio:
The water required for the area is **3,000 gal.**

C) Using a 50 lbs / 100 gal mulch/water ratio:
(2,400 gal / (2,500 gal/trip)) = **1 trip.**
Using a 40 lbs / 100 gal mulch/water ratio:
(3,000 gal / (2,500 gal/trip)) = 1.2 trips, so use **2 trips.**

Example #3 (Seed - Area of Coverage)

Given: Seed Application Rate 40 lb/acre.
200 lb of Seed is to be Applied.

Find: Area of Coverage.

Answer: Use the Seed or Fertilizer Hydraulic Application Chart, Table A-1.
Find the 40 lb/acre application rate column.
Find the 200 lb seed row.
Determine where the column and the row intersect and record the area.
For 40 lb/acre, the area of coverage is **5 acre (217,800 ft^2).**

Or

Use the Formula on the Hydraulic Application Equations Sheet.
Find the area of coverage equation under the title Seed or Fertilizer Hydraulic Application.
The area equation is A (acre) = W_{sf} / R_{sf}
Area (acre) = (200 lb) / (40 lb/acre) = **5 acre.**
Area (ft^2) = [(200 lb) / (40 lb/acre)] * (43,560 ft^2/acre) = **217,800 ft^2.**

Example #4 (Seed - Materials Needed)

Given: Required Area of Coverage .13 acre (5,662.8 ft^2).
Seed Application Rate 200 lb/acre.

Find: Amount of Seed Required in lbs.

Answer: Use the Seed or Fertilizer Hydraulic Application Chart, Table A-1.
Find the 200 lb/acre application rate column.
Move down the list of areas to 0.13 acre.
0.13 acre is not in this column, so interpolate.
Find the area above and below 0.13 acre.
Follow the row from the area to the Amount of Seed column.
For 0.10 acre (4,356 ft^2), the amount of seed is **20 lbs.**
For 0.15 acre (6,534 ft^2), the amount of seed is **30 lbs.**

At 0.13 acre (5,662.8 ft^2), the amount of seed is
0.13 acre * ((30 lb - 20 lb)/(0.15 acre - 0.10 acre)) = **26 lbs.**

Or

Use the Formula on the Hydraulic Application Equations Sheet.
Find the area of coverage equation under the title Seed or Fertilizer Hydraulic Application.
The area equation is A (acre) = W_{sf} / R_{sf}
Rearrange the equation so W_{sf} (lb) = (A) * (R_{sf})
Wsf (lb) = (0.13 acre) * (200 lb/acre) = **26 lbs.**

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ACRONYMS

USACOE	U.S. Army Corps of Engineers
AOS	Apparent Opening Size
ASTM	American Standards for Testing Materials
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
CWA	Clean Water Act
CWS	Clean Water Services
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
CZMA	Coastal Zone Management Act of 1972
DEQ	Department of Environmental Quality
DSL	Division of State Lands
DOF	Department of Forestry
ECRM	Erosion Control and Revegetation Mats
EPA	Environmental Protection Agency
EPCM	Erosion and Pollution Control Manager
EQC	Environmental Quality Commission
ESA	Endangered Species Act
ESCP	Erosion and Sediment Control Plan
HDPP	High Density Polyethylene Pipe
IECA	International Erosion Control Association
ISO	International Standards Organization
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System

ACRONYMS
(continued)

NRCS	Natural Resources Conservation Service
OAR	Oregon Administrative Rules
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
ORS	Oregon Revised Statutes
PCP	Pollution Control Plan
RUSLE	Revised Universal Soil Loss Equation
SWCD	Soil and Water Conservation District
TRM	Turf Reinforcement Mats
TSS	Total Suspended Solids
TMDL	Total Maximum Daily Load
WES	Water Environment Service

GLOSSARY OF TERMS

Adsorption	The adhesion of a substance to the substance to the surface of a solid or liquid. Heavy metals such as zinc and lead often adsorb onto particles.
Alluvial Soils	Soils developed from transported and relatively recently deposited material (alluvium) characterized by a weak modification (or none) of the original material by soil-forming processes.
Annual Storm	The highest peak storm discharge that is expected in any given year.
Apron	A pad of non-erosive material designed to prevent scour holes developing at the outlet ends of culverts, outlet pipes, grade stablilization structures, and other water control devices.
Aquifer	An underground porous, water-bearing geological formation. The term is generally restricted to materials capable of yielding an appreciable supply of water.
Base Flow	Stream discharge derived from groundwater sources as differentiated from surface runoff. Sometimes considered to include flows from regulated lakes or reservoirs.
Bedrock	The more or less solid rock in place either on or beneath the surface of the earth. It may be soft, medium or hard and have a smooth or irregular surface.
Berm	A constructed barrier of compacted earth.
Best Management Practices (BMP's)	Physical, structural and/or managerial practices employed to avoid or mitigate damage or potential damage from the contamination or pollution of surface waters or wetlands. Structural BMP's are actual physical installations rather than procedural/managerial BMP's, such as good housekeeping and employee training.
Catch Basin	A grated inlet, curb opening or combination inlet with or without a sump which admits storm water to a sewer or subdrain.
Channel	A natural stream or excavated ditch that conveys water.
Channel Stabilization	Protecting the sides and bed of a channel from erosion by controlling flow velocities and flow directions using jetties, drops or other structures and/or by lining the channel with a suitable liner such as vegetation, riprap, concrete or other similar material.

Check Dam	A small dam constructed in a gully or other small watercourse to decrease flow velocity, minimize channel scour and promote sediment deposition.
Clay	(1) Soil fraction consisting of particles less than 0.002 mm in diameter. (2) A soil texture class, which is dominated by clay or at least has a larger proportion of clay than either silt or sand.
Cohesion	The capacity of a soil to resist shearing stress, exclusive of functional resistance.
Cohesive Soil	A soil that, when unconfined, has considerable strength when air-dried and significant strength when saturated.
Coir	Fiber made from coconut husks.
Compost	Organic residue or a mixture of organic residues and soil that has undergone biological decomposition until it has become relatively stable humus.
Conventional Pollutants	Contaminants (other than nutrients) such as sediment, oil, and vehicle fluids.
Contour	An imaginary line on the surface of the earth connecting points of the same elevation.
Cut	Portion of land surface or area from which earth has been removed or will be removed by excavating the depth below the original ground surface to the excavated surface.
Cut-and-Fill	Process of earth grading by excavating part of a higher area and using the excavated material for fill to raise the surface of an adjacent lower area.
Cutoff Trench	A long, narrow excavation (keyway) constructed along the center line of a dam, dike, levee or embankment and filled with relatively impervious material intended to reduce seepage of water through porous strata.
Design Highwater	The elevation of the water surface at peak flow conditions of the design flood.
Design Storm	Selected storm of a given frequency used for designing a design storm system. Hypothetical storm derived from intensity-duration-frequency curves. A prescribed hyetograph and total precipitation amount (for a specific duration recurrence frequency) used to estimate runoff in order to analyze existing drainage, design new drainage facilities or assess impacts of a proposed project on surface water flow.

Detention	Storage and subsequent release of excess storm water runoff.
Detention Facility	An above or below ground facility, such as a pond or tank, which temporarily stores storm water runoff and releases it at a controlled rate. There is little or no infiltration of the stored storm water.
Detention Time	The theoretical time required to displace the contents of a tank or unit at a given rate of discharge (volume divided by rate of discharge).
Dewatering	The removal of water temporarily impounded in a holding basin.
Dike	An embankment to confine or control water, often built along the banks of a river o prevent overflow of lowlands; a levee.
Discharge	Usually the rate of water flow; a volume of fluid passing a point per unit time commonly expressed as cubic feet per second, cubic meters per second, gallons per minute, or millions of gallons per day.
Dispersion, Soil	The breaking down of fine soil aggregates into individual particles, resulting in single-grain structure. Ease of dispersion influences the erodibility of soils. Generally speaking, the more easily dispersed the soil, the more erodible it is.
Diversion	A channel with a supporting ridge on the lower side constructed at the top, across, or at the bottom of a slop for the purpose of controlling surface runoff.
Diversion Dike	A barrier built to divert surface runoff.
Drain	A buried slotted or perforated pipe or other conduit (subsurface drain) or a ditch (open drain) for carrying off surplus groundwater or surface water.
Drainage	The removal of excess surface water or groundwater from land by means of ditches or subsurface drains.
Drainageway	A natural or artificial depression that carries surface water to a larger watercourse or outlet such as a river, lake, or bay.
Drop Inlet	Overall structure in which the water drops through a vertical riser connected a discharge conduit or storm sewer.
Earth Dam	Dam constructed of compacted suitable soil materials.
Elongation	The increase in length produced in the gage length produced by a tensile load.
Embankment	A man-made deposit of soil, rock, or other material often used to form an impoundment.

Emergency Spillway	Usually a vegetated earth channel used to safely convey flood discharges around an impoundment structure.
Energy Dissipater	A device used to reduce the energy of flowing water to prevent erosion.
Environment	The sum total of all the external conditions that may act upon a living organism or community to influence its development or existence.
Erodibility	Susceptibility to erosion.
Erosion	The wearing away of the land surface by water, wind, ice, gravity, or other geological agents. The following terms are used to describe different types of water erosion:

- Accelerated erosion – Erosion much more rapid than normal or geological erosion, primarily as a result of the activities of man.
- Channel erosion - The erosion process whereby the volume and velocity of flow wears away the bed and/or banks of a well-defined channel.
- Gully erosion – The erosion process whereby runoff water accumulates in narrow channels and, over relatively short periods, removes the soil to considerable depths, ranging from 1 to 2 feet to as much as 75 to 100 feet.
- Rill erosion – An erosion process in which numerous small channels only several inches deep are formed; occurs mainly on recently disturbed and exposed soils. See Rill.
- Splash erosion – The spattering of small soil particles caused by the impact of raindrops on wet soils. The loosened and spattered particles may or may not be subsequently removed by surface runoff.
- Sheet erosion – The gradual removal of a fairly uniform layer of soil from the land surface by runoff water.

Erosion and Sediment Control	Any temporary or permanent measures taken to reduce erosion, control siltation and sedimentation, and ensure that sediment-laden water does not leave a site.
Erosion and Sediment Control Plan (ESCP)	Plans, specification and BMP details intended to prevent and control erosion and sediment related to the project construction activities.
Evapotranspiration	The combined loss of water from an area by evaporation from the soil surface and by transpiration of plants.
Filter Fabric	A woven or non-woven, water permeable material generally made of synthetic products such as polypropylene and used in erosion and sediment control applications to trap sediment or prevent the movement of fine soil particles. Often used instead of a filter blanket.
Flood Peak	The highest stage or greatest discharge attained by a flood event. Thus, peak states or peak discharge.

Floodplain	The lowland that borders a stream and is subject to flooding when the stream overflows its banks.
Flood Stage	The stage at which overflow of the natural banks of a stream begins.
Floodway	A channel, either natural, excavated, or bounded by dikes and levees, used to carry flood flows.
Freeboard	Vertical clearance between the normal operating level and the top side of an open conduit or channel. Vertical distance between the design water surface elevation and the elevation of the barrier retaining the water.
Frequency of Storm (Design storm frequency)	The anticipated period in years that will elapse before another storm of equal intensity and/or total volume will recur: a 10-year storm can be expected to occur on the average once very 10 years.
Gabion	A wire mesh cage, usually rectangular, filled with rock and used to protect channel banks and other sloping areas from erosion.
Gauge	Device for measuring precipitation, water level, discharge, velocity, pressure, temperature, etc., e.g., a rain gauge. A measure of the thickness of metal, e.g., diameter of wire or wall thickness of steel pipe.
Geotextile	Any permeable textile used with foundation, rock, earth or any other geotechnical engineering-related material as an integral part of a human-made project, structure or system.
Grade	(1) the slope of a road, a channel, or natural ground. (2) The finished surface of canal bed, roadbed, top of embankment, or bottom of excavation; any surface prepared to a design elevation for the support of construction such as paving or the laying of a conduit. (3) To finish the surface of a canal bed, roadbed, top of embankment, or bottom of excavation, or other land area to a smooth, even condition.
Grade Stabilization Structure	A structure for the purpose of stabilizing the grad of a gully or other watercourse, thereby preventing further head-cutting or lowering of the channel bottom.
Gradient	Change of elevation, velocity, pressure, or other characteristics per unit length; slope.
Grading	The cutting and/or filling of the land surface to a desired slope or elevation.
Grass	A member of the botanical family Gramineae, characterized by blade-like leaves that originate as a sheath wrapped around the stem.
Grassed Waterway	A natural or constructed waterway, usually broad and shallow, covered with erosion-resistant grasses and used to safely conduct surface water from an area.

Ground Cover	(Horticulture) Low-growing, spreading plans useful for low maintenance landscape areas.
Habitat	The environment in which the life needs of a plan or animal are supplied.
Harmful Pollutant	A substance which has adverse effects on an organism. Adverse effects include immediate death, chronic poisoning, impaired reproduction and other conditions.
Head Loss	Energy loss due to friction, eddies, changes in velocity, elevation or direction of flow.
Headwater	The source of a stream. The water upstream from a structure or point a stream.
Heavy Metals	Metals having a high specific gravity, present in municipal and industrial wastes, that pose long-term environmental hazards. Such metals include cadmium, chromium, cobalt, copper, lead, mercury, nickel and zinc.
Hydrologic Cycle	The circuit of water movement from the atmosphere to the earth and back to the atmosphere through various stages or processes such as precipitation, interception, runoff, infiltration, percolation, storage, evaporation, and transpiration.
Hydrology	The science of the behavior of water in the atmosphere, on the surface of the earth, and underground.
Impervious	A surface, which water, can not easily penetrate. Can include graveled surface as well as paved surfaces.
Infiltration	The downward movement of water from the surface to the subsoil.
Invert	The inside bottom of a culvert or other conduit.
Land Capability	The suitability of land for use. Land capability classification involves consideration of: 1) the risks of land damage from erosion and other causes and 2) the difficulties in land use owing to physical land characteristics, including climate.
Land Use Controls	Methods for regulating the uses to which a given land area may be put, including such things as zoning, subdivision regulation, and floodplain regulation.
Loam	A soil textural classification in which the proportions of sand, silt and clay are well balanced. Loams have the best properties for cultivation of plants.
Mean Velocity	The average velocity of a stream flowing in a channel or conduit at a given cross-section or in a given reach. It is equal to the discharge divided by the cross-section area of the reach.

Mitigation	means, in the following order or importance:
1.	Avoiding the impact altogether by not taking a certain action or part of an action.
2.	Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts.
3.	Rectifying the impact by repairing, rehabilitating or restoring the affected environment.
4.	Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action and
5.	Compensation for the impact by replacing, enhancing, or providing substitute resources or environments.
Mulch	A natural or artificial layer of plant residue or other materials covering the land surface which conserves moisture, holds soil in place, aids in establishing plant cover, and minimizes temperature fluctuations.
National Pollutant Discharge Elimination System (NPDES)	The part of the Federal Clean Water Act, which requires permits (NPDES permits) for point and nonpoint source discharges.
Natural Drainage	The flow patterns of storm water runoff over the land in its pre-development state.
Nonpoint Source Pollution	Pollution that enters a water body from diffuse origins on the watershed and does not result from discernible, confined, or discrete conveyances.
Normal Depth	Depth of flow in an open conduit during uniform flow for the given conditions.
Nutrients	Essential chemicals for plant and animal growth. Excessive amounts can lead to water quality degradation and algae blooms. Some nutrients are toxic at high concentrations.
Open Drain	Natural watercourse or constructed open channel that conveys drainage water.
Outfall	The point, location, or structure where wastewater or drainage discharge from a sewer to a receiving body of water.
Outlet	Point of water disposal from a stream, river, lake tidewater, or artificial drain.
Outlet Channel	A waterway constructed or altered primarily to carry water from man made structures, such as smaller channels, tiles, lines, and diversions.
Peak Discharge	The maximum, instantaneous flow rate during a storm, usually in reference to a specific design storm event.

Permeability	A generic term for the ability of a material to conduct a fluid.
Permeable Soils	Soil materials with filtration rate of 10 minutes per inch or better. Such soils allow infiltration and reduce or eliminate surface and storm water runoff. Classified as SCS (Soil Conservation Services) Type A.
Permeability Rate	The rate at which water will move through a saturated soil. Permeability rates are classified as follows:
•	Very slow – Less than 0.06 inches per hour.
•	Slow – 0.06 to 0.20 inches per hour.
•	Moderately slow – 0.20 to 0.63 inches per hour.
•	Moderate – 0.63 to 2.0 inches per hour.
•	Rapid – 6.3 to 20.0 inches per hour.
•	Very rapid – More than 20.0 inches per hour.
Permittivity	For a geotextile, the volumetric flow rate if water per unit cross-section area, per unit head, under laminar flow conditions, in the normal direction through the fabric.
Point Source	Any discernible, confined and discrete conveyance, including but not limited to, any pipe ditch, channel, tunnel, conduit, well, discrete fissure, container, roller stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.
Point Source Pollutants	Pollution, which enters a water, body resulting from discernible confined or discrete conveyances.
Pollution Control Plan (PCP)	Consists of Pollution Control Plan form, narrative, site map and details describing measures to prevent pollution related to contractor activities. Special Provision 00170.30 © spells out the Contractor's responsibilities related to Pollution Control.
Pervious	Allowing movement of water.
Porosity	The volume of pore space in soil or rock.
pH	A numerical measure of hydrogen ion activity. The neutral point is pH 7.0. All pH values below 7.0 are acid and all above 7.0 are alkaline.
Rainfall Intensity	The rate at which rain is falling at any given instant, usually expressed in inches per hour.
Rational Method	A means of computing storm drainage flow rates, Q, by use of the formula Q=CIA, where C is coefficient describing the physical drainage area, I is the rainfall intensity and A is the area.
Receiving Stream	The body of water into which runoff or effluent is discharged.

Retention	The process of collecting and holding surface and storm water runoff with no surface overflow.
Retention/Detention Facility	A type of drainage facility designed either to hold water for a considerable length of time and then release it by evaporation, plant transpiration, and/or infiltration into the ground, or to hold surface and storm water runoff for a short period of time and then release it to the surface and storm water management system.
Retention Structure	A natural or artificial basin that functions similar to a detention structure except that it maintains a permanent water supply.
Riparian	Pertaining to banks of streams, wetlands, lakes or tide waters.
Riser	The inlet portions of a drop inlet spillway that extends vertically from the pipe conduit barrel to the water surface.
Runoff	That portion of precipitation that flows from drainage area on the land surface, in open channels or in storm water conveyance systems.
Salmonid	A member of the fish family *salmonidae*. Includes Chinook, coho, chum, sockeye and pink salmon, cutthroat, steelhead, rainbow, Dolly varden, brook, kokanee and whitefish.
Sand	(1) Soil particles between 0.05 and 2.0 mm in diameter. (2) a soil textural class inclusive of all soils which are at least 70% sand and 15% or less clay.
Saturation	In soils, the point at which a soil or an aquifer will no longer absorb any amount of water without losing an equal amount.
Scour	The clearing and digging action of flowing water, especially the downward erosion caused by stream water in sweeping away mud and silt from the streambed and outside bank of a curved channel.
Sediment	Fragmented material originated from weathering and erosion of rocks and unconsolidated deposits. The material is transported by, suspended in, or deposited by water.
Sedimentation	Deposition or formation of sediment.
Sediment Delivery Ratio	The fraction of the soil eroded from upland sources that actually reaches a stream channel or storage reservoir.
Sediment Discharge	The quality of sediment, measured in dry weight or by volume, transported through a stream cross-section in a given time. Sediment discharge consists of both suspended load and bedload.
Seedbed	The soil prepared by natural or artificial means to promote the germination of seed and the growth of seedlings.
Seedling	A young plant grown from seed.

Sheet Erosion	Relatively uniform removal of soil form an area without the development of conspicuous water channels.
Sheet Flow	Relatively uniform flow over a plan surface without concentration of water into conspicuous channels.
Shoot	The above-ground portion of a plant.
Silt	(1) Soil fraction consisting of particles between 0.002 and 0.05 mm in diameter. (2) A soil textural class indicating more than 80% silt.
Siltation	Process by which a river, lake or other water body becomes clogged with sediment. Siltation can clog gravel beds and prevent successful salmon spawning.
Slope	Degree of deviation of a surface from the horizontal; measured as a numerical ration or percent. Expressed as a ratio, the first number is the horizontal distance (run) and the second is the vertical distance (rise), e.g., 2:1. Slope can also be expressed as the rise over the run. For instance, a 2:1 slope is a 50 percent slope.
Soil	Th unconsolidated mineral and organic material on the immediate surface of the earth that serves as a natural medium for the growth of land plants.
Soil Horizon	A horizontal layer of soil that, through processes of soil formation, has developed characteristics distinct from the layers above and below.
Soil Profile	A vertical section of the soil from the surface through all horizons.
Soil Stabilization	Use of rock-lining, vegetation or other methods to prevent soil movement when loads are applied to the soil.
Soil Structure	The relation of particles or groups of particles which impart to the whole soil a characteristic manner of breaking; some types are crumb structure, block structure, platy structure, and columnar structure.
Soil Texture	The physical structure or character of soil determined by the relative proportions of the soil separates (sand, silt and clay) of which it is composed.
Spillway	A passage such as a paved apron or channel for surplus water over or around or through a dam or similar structure. An open or closed channel, or both, sued to convey excess water from a reservoir. It may contain gates, whether manually or automatically controlled., to regulate the discharge of excess water.
Storm Frequency	The statistical time interval between major storms of predetermined intensity and runoff volumes for which storm sewers and other structures are designed and constructed to handle hydraulically without surcharge or backflood.

Storm Sewer	A sewer that carries storm water, surface drainage, street wash and other wash waters, but excludes sewage and industrial wastes. Also called a storm drain.
Storm Water	That portion of precipitation that does not percolate into the ground or evaporate, but flows via overland flow, interflow, channels or pipes into a defined surface water channel, or a constructed infiltration facility.
Storm Water Facility	A constructed component of a storm water drainage system, designed or constructed to perform particular function, or multiple functions. Storm water facilities include pipes, swales, ditches, culverts, street gutters, detention basins, retention basins, constructed wetlands and other.
Streambanks	The usual boundaries, not the flood boundaries, of a stream channel. Right and left banks are named facing downstream.
Subsoil	The B horizons of soils with distinct profiles. In soils with weak profile development, the subsoil can be defined as the soil below which roots do not normally grow.
Subsurface Drain	A pervious backfilled trench usually containing stone and perforated pipe for intercepting groundwater or seepage.
Surface Runoff	Precipitation that falls onto the surfaces of roofs, streets, the ground, etc., and is not absorbed or retained by that surface, but collects and runs off.
Suspended Solids	Organic or inorganic particles suspended in and carried by water, sand, mud, clay as well as solids.
Swale	An elongated depression in the land surface that is a least seasonally wet, is usually heavily vegetated, and is normally without flowing water. Swales conduct storm water into primary drainage channels and may provide some groundwater recharge.
Time of Concentration	The time period necessary for surface water runoff to reach the outlet of a sub-basin from the hydraulically most remote point in the tributary drainage area.
Toe of Slope	The base or bottom of a slope at the point where the ground surface abruptly changes to a significantly flatter grade.
Topography	General term to include characteristics of the ground surface such as plains, hills, mountains, degree of relief, steepness of slopes, and other physiographic features.
Topsoil	The dark-colored surface layer of A horizon of a soil. When present it ranges in depth from a fraction of an inch to 2 or 3 feet; equivalent to the plow layer of cultivated soils. Commonly used to refer to the surface soil layer(s), enriched in organic matter and having textural and structural characteristics favorable for plant growth.

Total Suspended Solids (TSS)	The entire amount of organic and inorganic particles dispersed in water. TSS are the larger particles in the water which are more easily removed by sedimentation than smaller particles which cause turbidity.
Toxicity	The characteristics of being poisonous or harmful to plant animal life; the relative degree or severity of the characteristic.
Trash Rack	A structural device used to prevent debris from entering a pipe spillway or other hydraulic structure.
Turbidity	Is caused by silt and clay particles, particles smaller than 0.02 mm, suspended in water. Measurement of turbidity can be done by turbidimeter which measures light-beam scatter caused by small suspended particles and converts it to NTU (national turbidity units).
Turf	Surface soil supporting a dense growth of grass and associated root mat.
Vegetative Stabilization	Protection of erodible or sediment-producing areas with: • Permanent seeding, producing long-term vegetative cover, • Short-term seeding, producing temporary vegetative cover, or • Sodding, producing areas covered with a turf of perennial sod-forming grass.
Watercourse	A definite channel with bed and banks within which concentrated water flows, either continuously or intermittently.
Water Quality	A term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose.
Water Resources	The supply of groundwater and surface water in a given area.
Watershed Area	All land and water within the confines of a drainage divide.
Water Table	The free surface of the groundwater. That surface subject to atmospheric pressure under the ground, generally rising and falling with the season, or from other conditions such as water withdrawal.
Weir	Device for measure or regulating the flow of water.
Wet Pond	A facility treating storm water by utilizing a permanent pool of water to remove conventional pollutants from runoff. Treatment mechanisms include sedimentation, biological uptake and plant filtration.
Wet Season	October to April.

REFERENCES

1. Arizona Department of Transportation, ADOT Erosion and Pollution Control Manual, June 1995.

2. Association of Bay Area Governments, Manual of Standards for Erosion and Sediment Control Measures, 1995.

3. Beak Consultants, Erosion Control Manual for ODOT Projects within the Tualatin River Basin, March 1993.

4. California Regional Water Quality Control Board – San Francisco Bay, Erosion and Sediment Control Field Manual.

5. Reconstruction of Existing Bridges, 1998.

6. Camp, Dresser & McKee, California Stormwater Best Management Practice Handbook, March 1993.

7. Charles A. White and A.L. Franks, Demonstration of Erosion and Sediment Control Technology Lake Tahoe Region of California, U.S. Environmental Protection Agency Publication EPA – 600/2 – 208, 1978.

8. Colorado Department of Transportation, Erosion Control and Stormwater Quality Guide Draft, November 1992.

9. FHWA, Hydraulic Design of Energy Dissipaters for Culverts and Channels, Hydraulic Engineering Curricular No. 14, September 1983.

10. Goldman, S.J., Jackson, K., Bursztynsky, T.A., Erosion and Sediment Control Handbook, McGraw-Hill, Inc., 1986.

11. King County, Washington Surface Design Manual, Department of Public Works, 1994.

12. Koerner, Robert M., Designing with Geosynthetics, Prentice-Hall, 1986.

13. McCullah, J., Salix Applied Earthcare, Erosion Draw 2.0, Erosion and Sediment Control Manual for Computer-Aided Drafting, 1994.

14. North Carolina Sediment Control Commission, North Carolina Department of Natural Resources, and Community Development, and the North Carolina Agricultural Extension Service, Erosion and Sediment Control Planning and Design Manual, 1988.

15. North Carolina Sediment Control Commission, North Carolina Department of Natural Resources, and Community Development, and the North Carolina Agricultural Extension Service, Erosion and Sediment Control Field Manual, 1988.

16. ODOT and Woodward-Clyde Consultants, Implementation Plan for the Oregon Department of Transportation NPDES permit Program (within the Portland Urban Services Area), June 1994.

17. ODOT Highway Division, Hydraulic Manual., 1990.

18. Oregon City Ordinance 95 – Amendment to Title17, Chapter 47 (Erosion Control)

19. San Francisco Estuary Project, Comprehensive Conservation and Management Plan, 1994.

20. Storm Water Quality Task Force, California Storm Water Best Management Practice Handbooks, Construction Activity Volume 3, 1993.

21. Tisdale, S.L., Werner, N.L., Beaton, J.D., Havlin, J.L., Soil Fertility and Fertilizers Fifth Edition, Macmillan Publishing Company, New York 1993.

22. Unified Sewerage Agency and City of Portland, Bureau of Environmental Services, Erosion Prevention and Sediment Control Plans, Technical Guidance Handbook, February, 1994.

23. Unified Sewerage Agency, Design and Construction Standards for Sanitary Sewer and Surface Water Management, 2000.

24. University of Madison Wisconsin – Madison, College of Engineering, Department of Engineering Professional Development, Applied Biogeotechnology , Sensible Solutions for our Build Environment, 1998.

25. USDOT, Best Management Practices and Erosion and Erosion and Sediment Control, FHWA-FLP-94-0005, June 1995.

26. Virginia Soil and Water Commission, Virginia Erosion and Sediment Control Handbook, Edition 2, Richmond, Virginia, 1980.

27. Washington State Department of Ecology, Storm Water Management Manual for the Puget Sound Basin, The Technical Manual, February 1992.

28. Washington State Department of Transportation, Highway Runoff Manual, February 1995.

29. Wolmon, and A.P. Schick, Water Resources Research, 3:451-464, 1967.

30. Washington State Department of Ecology, Stormwater Management Manual for the Puget Sound Basin, 1992.

31. Aldrich, Bob; Kramer, Chin & Mayo, Inc., Seattle, WA, personal communication.

32. Hopkins, Keith, Hobbs and Hopkins, Ltd., Portland, OR, personal communication.

33. King County, Washington, Surface Water Management Division, Department of Public Works. January 1990. " Surface Water Design Manual".

34. Oregon Administrative Rules. 1989. OAR 340-41-455.

35. Oregon Department of Transportation, State Highway Division. 1984. "Standard Specifications for Highway Construction".

36. Oregon Department of Transportation, State Highway Division. "Hydraulics Manual".

37. ODOT Erosion and Sediment Control Manual, 2000.

38. U.S. Department of Agriculture, Science & Education Administration. December 1978. Predicting Rainfall Erosion Losses, A Guide to Conservation Planning. Agriculture Handbook No. 537

39. USDA Soil Conservation Service and Washington County Soil and Water Conservation District. April 1981. "Urban Conservation Guide for Washington County, Oregon", parts A and B.

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WES


CLACKAMAS
COUNTY

City of Oregon City

Addendum to the Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual

Adoption

Use of the Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual as modified by this City of Oregon City Addendum to the Manual, was adopted by the City Commission through Resolution No. 15-14, at the City Commission meeting on May 20, 2015.

Background

This Oregon City Erosion Prevention and Sediment Control Planning and Design Manual Addendum includes resources and information to provide a comprehensive and detailed approach towards controlling erosion on construction sites to assist those performing work in Oregon City.

Oregon City has developed this addendum to the multi-jurisdictional Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual ("Manual") to make minor modifications to the Clackamas County Manual to suit the needs of Oregon City.

This addendum is organized in accordance with the Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual, revised December 2008.

City Modifications to the County's Manual

Changes and updates to the County's Manual are identified below:

Item 1 – Preface: In paragraph 1, line 4, before "West Linn" insert "Oregon City,".

Item 2 – Page 1-2, Section 1.2, Background and Policies: In the first paragraph, after the third sentence, insert the following:

"In Oregon City, the threshold is 1,000 square feet."

Item 3 – Page 1-3, Section 1.3, National Pollution Discharge Elimination System (NPDES) Permit Requirements: In the first paragraph, add the following sentence to the end of the paragraph:

"The City of Oregon City does not have a Memorandum of Agreement (MOA) with DEQ to issue the 1200-C permits on their behalf so construction sites in Oregon City greater than 1 acre in size require the developer/contractor to obtain both a 1200-C permit from DEQ and a City of Oregon City Erosion Control Permit."

Item 4 – Page 4-10, Section 4.1.3, Ground Cover: Under Design Criteria, insert the following bulleted item at the end of the list:

"• Disturbed soil exposed for 21 days or more during dry weather season (May 1 to September 30) and seven days or more during the wet weather season (October 1 to April 30) shall be protected from erosion by placing ground cover."

Item 5 – Page 6-1, Permittee Site Inspector: In the second paragraph, first line, directly after "Permittee Site Inspector (PSI)", insert "or Site Steward".

Item 6 – Chapter 7: Immediately following page 6-8, insert the following Chapter 7, Erosion and Sediment Control Permits:

"CHAPTER 7
EROSION AND SEDIMENT CONTROL PERMITS

An Erosion and Sediment Control Permit is required prior to or contemporaneous with approval of development that may cause visible or measurable erosion. Projects that disturb 1,000 square feet or greater of soil require an Erosion and Sediment Control Permit. The Permit will be issued by the City of Oregon City Public Works Department's Erosion Control Program Manager upon approval of the Erosion and Sediment Control plan for the project.

7.1 Permit Fee

A fee will be charged to obtain an Erosion and Sediment Control Permit from the City. The fee will cover review of Erosion and Sediment Control plans and site inspections for compliance.

7.2 Erosion Control Certification

Developers and contractors of development activities requiring erosion control permits who have a certified individual on staff with authority over erosion control and who is responsible for erosion control of the site (site steward) are eligible for a discount of the erosion control fees.

Certification shall involve training in erosion and sediment control techniques, issues and implementation strategies. A minimum of four hours of classroom instruction shall be required every two years to maintain eligibility for the discounted fee.

7.3 Permits from Other Jurisdictions

The Oregon State Department of Environmental Quality (DEQ) will issue NPDES 1200-C permits for projects that meet permit requirements. Developers and contractors who are required to obtain 1200-C permits from DEQ are also required to obtain a City of Oregon City Erosion and Sediment Control Permit for the project. No construction permit will be issued for projects requiring the 1200-C permit without a copy of that permit being on file with the City of Oregon City. DEQ is responsible for enforcing its own permits, however, if City personnel observe conditions that are believed to be in violation of any such permit, and cannot get corrections made, they will bring such conditions to the attention of appropriate DEQ representatives.

In-water work projects often require Oregon Division of State Lands (DSL) and/or United States Army Corps of Engineers (COE) permits. Developers and contractors who are required to obtain DSL/COE permits are also required to obtain a City of Oregon City Erosion and Sediment Control Permit for the project. No construction permit will be issued for projects requiring the DSL/COE permit without a copy of that permit being on file with the City of Oregon City. DSL/COE is responsible for enforcing their own permits; however, if City personnel observe conditions that are believed to be in violation of any such permit, and cannot get corrections made, they will bring such conditions to the attention of appropriate DSL/COE representatives.

Occasionally, projects may require Oregon Department of Fish and Wildlife (ODFW) permits. Developers and contractors who are required to obtain ODFW permits are also required to obtain a City of Oregon City Erosion and Sediment Control Permit for the project. No construction permit will be issued for projects requiring the ODFW permit without a copy of that permit being on file with the City of Oregon City. ODFW is responsible for enforcing its own permits; however, if City personnel observe conditions that are believed to be in violation of any such permit, and cannot get corrections made, they will bring such conditions to the attention of appropriate ODFW representatives."

Oregon
John A. Kitzhaber, M.D., Governor

Department of Land Conservation and Development
635 Capitol Street NE, Suite 150
Salem, Oregon 97301-2540
Phone: (503) 373-0050
Fax: (503) 378-5518
www.oregon.gov/LCD

NOTICE OF ADOPTED CHANGE TO A COMPREHENSIVE PLAN OR LAND USE REGULATION

Date: June 04, 2015

Jurisdiction: City of Oregon City

Local file no.: LE 15-01

DLCD file no.: 001-15

The Department of Land Conservation and Development (DLCD) received the attached notice of adopted amendment to a comprehensive plan or land use regulation on 05/29/2015. A copy of the adopted amendment is available for review at the DLCD office in Salem and the local government office.

Notice of the proposed amendment was submitted to DLCD less than 35 days prior to the first evidentiary hearing.

Appeal Procedures

Eligibility to appeal this amendment is governed by ORS 197.612, ORS 197.620, and ORS 197.830. Under ORS 197.830(9), a notice of intent to appeal a land use decision to LUBA must be filed no later than 21 days after the date the decision sought to be reviewed became final. If you have questions about the date the decision became final, please contact the jurisdiction that adopted the amendment.

A notice of intent to appeal must be served upon the local government and others who received written notice of the final decision from the local government. The notice of intent to appeal must be served and filed in the form and manner prescribed by LUBA, (OAR chapter 661, division 10).

If the amendment is not appealed, it will be deemed acknowledged as set forth in ORS 197.625(1)(a). Please call LUBA at 503-373-1265, if you have questions about appeal procedures.

DLCD Contact

If you have questions about this notice, please contact DLCD's Plan Amendment Specialist at 503-934-0017 or plan.amendments@state.or.us

DLCD FORM 2

NOTICE OF ADOPTED CHANGE TO A COMPREHENSIVE PLAN OR LAND USE REGULATION

FOR DLCD USE
File No.: 001-15 {23822}
Received: 5/29/2015

Local governments are required to send notice of an adopted change to a comprehensive plan or land use regulation **no more than 20 days after the adoption**. (*See* OAR 660-018-0040). The rules require that the notice include a completed copy of this form. **This notice form is not for submittal of a completed periodic review task or a plan amendment reviewed in the manner of periodic review.** Use Form 4 for an adopted urban growth boundary including over 50 acres by a city with a population greater than 2,500 within the UGB or an urban growth boundary amendment over 100 acres adopted by a metropolitan service district. Use Form 5 for an adopted urban reserve designation, or amendment to add over 50 acres, by a city with a population greater than 2,500 within the UGB. Use Form 6 with submittal of an adopted periodic review task.

Jurisdiction: CITY OF OREGON CITY

Local file no.: **LE 15-01**

Date of adoption: May 20, 2015 Date sent: 5/29/2015

Was Notice of a Proposed Change (Form 1) submitted to DLCD?

Yes: Date (use the date of last revision if a revised Form 1was submitted): N/A

(No)

Is the adopted change different from what was described in the Notice of Proposed Change? Yes No

If yes, describe how the adoption differs from the proposal:

N/A

Local contact (name and title): Pete Walter, AICP, Associate Planner

Phone: (503) 496-1568 E-mail: pwalter@orcity.org

Street address: 221 Molalla Avenue, Ste. 200 City: Oregon City Zip: 97045

PLEASE COMPLETE ALL OF THE FOLLOWING SECTIONS THAT APPLY

For a change to comprehensive plan text:

Identify the sections of the plan that were added or amended and which statewide planning goals those sections implement, if any:

Amends OCMC 13.12, Stormwater Management, and adopts new design standards for stormwater mgmt., grading, erosion prevention and sediment control. Statewide Goals implemented: 1, 2, 5, 6, 7, 11 & 13.

For a change to a comprehensive plan map:

Identify the former and new map designations and the area affected:

Change from N/A	to N/A	N/A acres.	A goal exception was required for this change.
Change from N/A	to N/A	N/A acres.	A goal exception was required for this change.
Change from N/A	to N/A	N/A acres.	A goal exception was required for this change.
Change from N/A	to N/A	N/A acres.	A goal exception was required for this change.

Location of affected property (T, R, Sec., TL and address): N/A

The subject property is entirely within an urban growth boundary

The subject property is partially within an urban growth boundary

If the comprehensive plan map change is a UGB amendment including less than 50 acres and/or by a city with a population less than 2,500 in the urban area, indicate the number of acres of the former rural plan designation, by type, included in the boundary.

Exclusive Farm Use – Acres: N/A
Non-resource – Acres: N/A
Forest – Acres: N/A
Marginal Lands – Acres: N/A
Rural Residential – Acres: N/A
Natural Resource/Coastal/Open Space – Acres: N/A
Rural Commercial or Industrial – Acres: N/A
Other: N/A – Acres: N/A

If the comprehensive plan map change is an urban reserve amendment including less than 50 acres, or establishment or amendment of an urban reserve by a city with a population less than 2,500 in the urban area, indicate the number of acres, by plan designation, included in the boundary.

Exclusive Farm Use – Acres: N/A
Non-resource – Acres: N/A
Forest – Acres: N/A
Marginal Lands – Acres: N/A
Rural Residential – Acres: N/A
Natural Resource/Coastal/Open Space – Acres: N/A
Rural Commercial or Industrial – Acres: N/A
Other: N/A – Acres:

For a change to the text of an ordinance or code:
Identify the sections of the ordinance or code that were added or amended by title and number:

Amends City of Oregon City Municipal Code Chapter 13.12 - Stormwater Management.

For a change to a zoning map:
Identify the former and new base zone designations and the area affected:

Change from N/A to N/A Acres: N/A
Change from N/A to N/A Acres: N/A
Change from N/A to N/A Acres: N/A
Change from N/A to N/A Acres: N/A

Identify additions to or removal from an overlay zone designation and the area affected:

Overlay zone designation: N/A Acres added: N/A Acres removed: N/A

Location of affected property (T, R, Sec., TL and address): N/A

List affected state or federal agencies, local governments and special districts: Oregon City, ODOT, Metro, Tri-Met, Clackamas County, Clackamas River Water District, Tri-City Sewer District, Water Environment Services.

Identify supplemental information that is included because it may be useful to inform DLCD or members of the public of the effect of the actual change that has been submitted with this Notice of Adopted Change, if any. If the submittal, including supplementary materials, exceeds 100 pages, include a summary of the amendment briefly describing its purpose and requirements.

N/A

RESOLUTION No. 15-14

A RESOLUTION ADOPTING CITY OF OREGON CITY PUBLIC WORKS STORMWATER AND GRADING DESIGN STANDARDS AND CLACKAMAS COUNTY EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL COUPLED WITH AN OREGON CITY ADDENDUM

WHEREAS, in 1999, the City of Oregon City adopted Public Works Stormwater and Grading Design Standards, to be incorporated as part of the City's Drainage Master Plan, dated January 1988; and

WHEREAS, the 1999 Public Works Stormwater and Grading Design Standards, setting forth standards applicable to the design of stormwater drainage facilities are outdated and in need of revision; and

WHEREAS, Oregon City Municipal Code Section 13.12.020 authorizes the City Commission to adopt amended storwater standards through adoption of a resolution; and

WHEREAS, the standards are intended for use by property owners, developers, and design professionals as general design guidelines for all publicly and privately-owned and maintained stormwater management facilities within the City; and

WHEREAS, the proposed standards represent specific guidelines for implementing City stormwater goals and policies in the Comprehensive Plan; and

WHEREAS, the City of Oregon City adopted Ordinance 15-1006 to address the problems identified above by amending Oregon City Code; Chapter 13.12, entitled Stormwater Management; and

WHEREAS, in 2008, Clackamas County issued a multi-jurisdictional Erosion Prevention and Sediment Control Planning and Design Manual to provide a comprehensive and detailed approach toward controlling erosion on construction sites to asses those performing work in Oregon City; and

WHEREAS, the City of Oregon City developed an addendum to the Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual to make minor modifications to suit the needs of Oregon City; and

WHEREAS, the adoption of Public Works Stormwater and Grading Design Standards and the Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual, along with the addendum, will contribute to the safeguarding of human life, the protection of property and the improvement of water quality.

NOW, THEREFORE, BE IT RESOLVED, by the City Commission of Oregon City that:

Section 1. The City hereby adopts the City of Oregon City Public Works Stormwater and Grading Design Standards, dated February, 2015, and attached hereto as Exhibit 'A.' The Public Works Stormwater and Grading Design Standards implement Ordinance 15-1006, which enacted new Chapters 13.12 of the Oregon City Municipal Code.

Section 2. The City further hereby adopts the Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual, attached hereto as Exhibit 'B,' along with the addendum attached hereto as Exhibit 'C.'

Section 3. Look-back. Within one year after these standards take effect, the City's Public Works staff shall compile and present an impact report to the City Commission explaining how implementation of these provisions have affected the overall cost of development activities within the City. From that report, the City Commission may make further amendments.

Section 4. Severability. If any provision of this Resolution or its application to any person or circumstance is held invalid, the invalidity does not affect other provisions or applications of this Resolution that can be given effect without the invalid provision or application, and to this end the provisions of this Resolution are severable.

Section 5. Effectiveness. This Resolution shall take effect 90 days from the date of adoption.

Read and adopted at a regular meeting of the City Commission held on the 20th day of May, 2015.

DAN HOLLADAY, Mayor

Attested to this 20th day of May 2015:

Kattie Riggs, City Recorder

Approved as to legal sufficiency:

City Attorney

Exhibits:
A: City of Oregon City Public Works Stormwater and Grading Design Standards
B: Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual
C: City of Oregon City Addendum to the Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual

GSB:7005802.1

RESOLUTION No. 15-14

A RESOLUTION ADOPTING CITY OF OREGON CITY PUBLIC WORKS STORMWATER AND GRADING DESIGN STANDARDS AND CLACKAMAS COUNTY EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL COUPLED WITH AN OREGON CITY ADDENDUM

WHEREAS, in 1999, the City of Oregon City adopted Public Works Stormwater and Grading Design Standards, to be incorporated as part of the City's Drainage Master Plan, dated January 1988; and

WHEREAS, the 1999 Public Works Stormwater and Grading Design Standards, setting forth standards applicable to the design of stormwater drainage facilities are outdated and in need of revision; and

WHEREAS, Oregon City Municipal Code Section 13.12.020 authorizes the City Commission to adopt amended storwater standards through adoption of a resolution; and

WHEREAS, the standards are intended for use by property owners, developers, and design professionals as general design guidelines for all publicly and privately-owned and maintained stormwater management facilities within the City; and

WHEREAS, the proposed standards represent specific guidelines for implementing City stormwater goals and policies in the Comprehensive Plan; and

WHEREAS, the City of Oregon City adopted Ordinance 15-1006 to address the problems identified above by amending Oregon City Code; Chapter 13.12, entitled Stormwater Management; and

WHEREAS, in 2008, Clackamas County issued a multi-jurisdictional Erosion Prevention and Sediment Control Planning and Design Manual to provide a comprehensive and detailed approach toward controlling erosion on construction sites to asses those performing work in Oregon City; and

WHEREAS, the City of Oregon City developed an addendum to the Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual to make minor modifications to suit the needs of Oregon City; and

WHEREAS, the adoption of Public Works Stormwater and Grading Design Standards and the Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual, along with the addendum, will contribute to the safeguarding of human life, the protection of property and the improvement of water quality.

NOW, THEREFORE, BE IT RESOLVED, by the City Commission of Oregon City that:

Section 1. The City hereby adopts the City of Oregon City Public Works Stormwater and Grading Design Standards, dated February, 2015, and attached hereto as Exhibit 'A.' The Public Works Stormwater and Grading Design Standards implement Ordinance 15-1006, which enacted new Chapters 13.12 of the Oregon City Municipal Code.

Section 2. The City further hereby adopts the Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual, attached hereto as Exhibit 'B,' along with the addendum attached hereto as Exhibit 'C.'

Section 3. Look-back. Within one year after these standards take effect, the City's Public Works staff shall compile and present an impact report to the City Commission explaining how implementation of these provisions have affected the overall cost of development activities within the City. From that report, the City Commission may make further amendments.

Section 4. Severability. If any provision of this Resolution or its application to any person or circumstance is held invalid, the invalidity does not affect other provisions or applications of this Resolution that can be given effect without the invalid provision or application, and to this end the provisions of this Resolution are severable.

Section 5. Effectiveness. This Resolution shall take effect 90 days from the date of adoption.

Read and adopted at a regular meeting of the City Commission held on the 20th day of May, 2015.

_____
DAN HOLLADAY, Mayor

Attested to this 20th day of May 2015:

_____
Kattie Riggs, City Recorder

Approved as to legal sufficiency:

_____
City Attorney

Exhibits:
A: City of Oregon City Public Works Stormwater and Grading Design Standards
B: Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual
C: City of Oregon City Addendum to the Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual

GSB:7005802.1

City of Oregon City

625 Center Street
Oregon City, OR 97045
503-657-0891

Staff Report

File Number: 15-294

Agenda Date: 5/20/2015

Status: Agenda Ready

To: City Commission

Agenda #: 7f.

From: Public Works Director John Lewis

File Type: Ordinance

SUBJECT:
Second Reading of Ordinance No. 15-1006, Adopting Amendments to Oregon City Municipal Code Chapter 13.12, Stormwater Management

RECOMMENDED ACTION (Motion):
Staff recommends the City Commission approve the second reading of Ordinance No. 15-1006, adopting amendments to the Oregon City Municipal Code Chapter 13.12, Stormwater Management.

BACKGROUND:
The City is required to revise and update its stormwater management program in order to comply with the permit requirements under the City's National Pollution Discharge Elimination Systems Permit (NPDES) from the Oregon Department of Environmental Quality (DEQ) and the Federal Environmental Protection Agency (EPA). This ordinance amends OCMC Section 13.12, Stormwater Management to correspond with the revised Public Works Stormwater and Grading Design Standards and Erosion Prevention and Sediment Control Planning Manual, which are being adopted through a separate resolution.

The purpose of OCMC Chapter 13.12 is to define policies, minimum requirements, minimum standards and design procedures and permits for the construction and maintenance of stormwater conveyance and quantity and quality control facilities. It accomplishes this by:

- Minimizing increased stormwater runoff rates from new development so as to minimize the impact upon any downstream natural channel that may exist between the subject area and the Willamette or Clackamas Rivers;
- Preventing water runoff generated by development from exceeding the capacity of downstream stormwater facilities;
- Reducing stormwater runoff rates and volumes, soil erosion and pollution, wherever possible, from developed and developing lands;
- Preventing the uncontrolled or irresponsible discharge of stormwater from new development onto adjoining public or private property;
- Maintaining the integrity of stream channels for their biological functions, as well as for drainage and other purpose.

This chapter is being amended in order to correspond with changes being made within the Public Works Departments key stormwater management documents including the Public Works Stormwater and Grading Design Standards and Erosion Prevention and Sediment Control Planning Manual.

The first reading was approved at the May 6, 2015 City Commission meeting, and staff is now recommending approval of the second reading of the ordinance.

Chapter 13.12 STORMWATER MANAGEMENT

Sections:

13.12.010 Purpose.

13.12.020 Adoption of standards.

13.12.030 Superseding Oregon City Drainage Master Plan Appendix A.

13.12.040 Definitions.

13.12.050 Applicability and exemptions.

13.12.060 Abrogation and greater restrictions.

13.12.070 Severability.

13.12.080 Submittal requirements.

13.12.090 Approval criteria for engineered drainage plans and drainage report.

13.12.100 Alternative materials, alternative design and methods of construction.

13.12.110 Transfer of engineering responsibility.

13.12.120 Standard Construction Specifications.

13.12.130 Administrative provisions.

13.12.140 Maintenance of public stormwater facilities.

13.12.150 Penalties and enforcement.

13.12.160 Hazardous conditions.

13.12.170 Permits from other jurisdictions.

13.12.180 Violation—Penalty.

13.12.010 Purpose.

The purpose of this chapter is to define policies, minimum requirements, minimum standards and design procedures and permits for the construction and maintenance of stormwater conveyance and quantity and quality control facilities in order to:

A. Minimize increased stormwater runoff rates from any development so as to minimize the impact upon any downstream natural channel that may exist between the subject area and the Willamette or Clackamas Rivers;

B. Prevent water runoff generated by development from exceeding the capacity of downstream stormwater facilities;

C. Reduce stormwater runoff rates and volumes, soil erosion and pollution, wherever possible, from developed and developing lands;

D. Prevent the uncontrolled or irresponsible discharge of stormwater from new development onto adjoining public or private property;

E. Maintain the integrity of stream channels for their biological functions, as well as for drainage and other purposes;

F. Have stormwater conveyance facilities of adequate design to manage all volumes of water generated in the contributing drainage area, for both the existing condition and the anticipated future condition;

G. Have all stormwater facilities:

1. Designed to mimic natural hydrologic conditions, to the maximum extent practicable,

2. Designed in a manner to allow economical future maintenance,

2. If city owned or maintained, designed for maintenance with city owned equipment,

3. Designed using materials that will ensure a minimum practical design life of seventy-five years, and

4. Designed to have sufficient structural strength to resist erosion and all external loads (construction, traffic, seismic) which may be imposed;

H. Establish maintenance easements with the owners of privately owned/maintained stormwater facilities to ensure an appropriate level of maintenance and to help minimize public safety hazards;

I. Have all new stormwater facilities comply with applicable National Pollutant Discharge Elimination System (NPDES) requirements;

J. Minimize the deterioration of existing watercourses, culverts, bridges, dams and other structures;

K. Minimize increases in stormwater pollution; and

L. Allow for periodic inspections of both private and public stormwater quantity control and quality control facilities to verify that they are functioning in substantial conformance with the approved design intent.

M. Allow issuance of engineering permits for stormwater work in the right-of-way or public easements either as a separate Public Works permit or as part of overall issued public infrastructure construction plans. The various fees for these permits are approved and modified from time to time by the city commission. Failure to meet the conditions of the issued permit shall constitute a violation of the Municipal Code. (Ord. 99-1029 §2 (part), 1999)

(Ord. No. 10-1003, § 1(Exh. 1), 7-7-2010)

13.12.020 Adoption of standards.

The city commission may establish and modify from time to time by resolution Public Works Stormwater and Grading Design Standards to implement the requirements of this chapter.

(Ord. 99-1029 §2 (part), 1999)

13.12.030 Superseding Oregon City Drainage Master Plan Appendix A.

The policies and standards of this chapter are intended to be consistent with the applicable sections of the Oregon City Drainage Master Plan dated January 1988, and applicable basin master plans, for land drainage and flood control within the Oregon City urban growth area, as adopted by the city. Appendix A of the Oregon City Drainage Master Plan dated January 1988 is superseded by the Public Works Stormwater and Grading Design Standards adopted by resolution and as periodically amended.

(Ord. 99-1029 §2 (part), 1999)

13.12.040 Definitions.

Unless specifically defined below, words and phases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application.

"Applicant" means a person, party, firm, corporation or other legal entity that has applied for a development permit or approval.

"Bulk petroleum storage" means storage of any type of bulk liquid petroleum or petroleum waste materials stored outside in multiple above ground storage tanks (AST). Multiple ASTs include two or more tanks that are either within the same secondary containment structure or within twenty feet of each other.

"Catch basin" means a structure, normally with a sump, for receiving drainage from a gutter or median and discharging the water through a conduit.

"City" means the City of Oregon City.

"City engineer" means the city engineering manager, their duly authorized representative(s), or the city's duly authorized representative(s) as designated by the city manager.

"Clearing" means surface removal of vegetation.

"Constructed wetlands" means wetlands developed as a water quality or quantity facility, subject to maintenance and modification as such. These areas must be clearly defined and/or separated from naturally occurring wetlands or wetlands created for mitigation purposes.

"Contributing drainage area" means the subject property together with the land area contributing runoff to it.

"Conveyance" means a channel or conduit to move water from one point to another point.

"Culvert" means a hydraulically short conduit that conveys surface drainage in artificial or natural watercourses through a roadway embankment or past some other type of flow obstruction.

"Dam" means a water storage structure that may or may not meet Oregon Revised Statute (ORS) requirements for height and storage capacity. All such structures require professional engineer design. If the water storage structure exceeds the ORS criteria for height or storage capacity, then the Oregon State Water Resources Commission shall have approval authority.

"DEQ" means the Oregon Department of Environmental Quality.

"Development" means any manmade change to improved or unimproved real estate, including but not limited to, the construction of building or other structures, utility infrastructure, grading, streets or other structures or facilities, mining, dredging, paving, filling or excavation. Development does not include the following: (1) stream enhancement or restoration projects approved by the city; (2) farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of this chapter.

"Disturb" means man-made changes to the existing physical status of the land that are made in connection with development.

"Drainage feature" means any natural or man-made structure, facility, conveyance or topographic feature which has the potential to concentrate, convey, detain, retain, infiltrate or affect the flow rate of stormwater runoff.

"DSL" means the Oregon Division of State Lands.

"Easement" means the legal right to use a parcel of land for a particular purpose. It does not include fee ownership, but may restrict the owner's use of the land.

"Embankment" means a raised structure of earth, gravel or similar material above the surrounding grade.

"Engineer" means a registered professional engineer licensed by the state of Oregon.

"Enhancement" means the process of improving upon the natural functions and/or values of an area or feature that has been degraded by human activity. Enhancement activities may or may not return the site to a predisturbance condition, but create/recreate processes and features that occur naturally.

"Erosion" means the movement of soil particles resulting from actions of water, wind or mechanical means.

"Excavation" means the mechanical removal of earth material.

"Fill" means any material such as, but not limited to, sand, gravel, soil, rock or gravel that is placed for the purposes of development or redevelopment.

"Floodplain" means the land area identified and designated by the United States Army Corps of Engineers, the Oregon Division of State Lands, the Federal Emergency Management Agency or City of Oregon City that has been or may be covered temporarily by water as a result of a storm event of identified frequency. It is usually the flat area of land adjacent to a stream or river formed by floods.

"Fuel dispensing facilities" means the area (including fuel islands, above ground fuel tanks, fuel pumps, and the surrounding pad) where fuel is transferred from bulk storage tanks to vehicles, equipment, and/or mobile containers.

"Grading" means any excavating, filling, embanking or altering contours of earth material.

"Grubbing" means the removal of vegetative matter from below the surface of the ground, such as sod, stumps, roots, buried logs or other debris, and shall include the incidental removal of topsoil to a depth not exceeding twelve inches.

"Impervious surfaces" means a hard surface area which prevents or retards the entry of water into the soil mantle and/or causes water to run off the surface in greater than natural quantities or at an increased rate. Impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking lots, concrete or asphalt paving, gravel surfaces with compacted subgrade, packed earthen materials and oiled macadam or other surfaces which similarly impede the infiltration of stormwater. Open, uncovered stormwater management facilities shall not be considered impervious surfaces.

"Inlet" means a connection between the surface of the ground and a drain or sewer for the admission of surface and stormwater runoff.

"Maintenance" means any activity that is necessary to keep an existing stormwater facility in good working order so as to function as designed. Maintenance includes complete reconstruction of a stormwater facility, if needed to return the facility to good working order. Maintenance also includes the correction of any problem on the site property that may directly impact the function of the stormwater facilities.

"Maintenance easement" means a binding agreement between the city and the person or persons holding title to a property served by a stormwater facility where the property owner promises to maintain certain stormwater facilities; grants the city the right to enter the subject property to inspect and make certain repairs, or perform certain maintenance procedures on the stormwater control facilities when such repairs or maintenance have not been performed by the property owner; and promises to reimburse the city for the cost should the city perform such repairs or maintenance.

"NPDES" means the National Pollutant Discharge Elimination System. A national permit system that covers discharges to waters of the United States and is enforced under the Federal Water Pollution Control Act, commonly known as the Clean Water Act.

"Owner or property owner" means the person who is the legal record owner of the land, or where there is a recorded land sale contract, the purchaser thereunder.

"Parcel" means a single unit of land that is created by a partitioning of land (ORS 92.010(7)).

"Plans" mean the construction documents and specifications, including system site plans, storm drain plans and profiles, cross sections, detailed drawings, etc. or reproductions thereof, approved or to be approved by the city, county, or state. They will show the location, character, dimensions and details for the work to be done.

"Private stormwater facility" means a stormwater facility located on private property and maintained by private property owners.

"Professional engineer" means a registered professional engineer licensed by the state of Oregon..

"Project engineer" means the professional engineer responsible for the project, who will affix his/her seal on the project drainage plans and drainage analysis and supervise construction of the stormwater facilities. The project engineer shall be licensed in the state of Oregon and qualified by experience or examination.

"Public stormwater facility" means any stormwater facility in the public right-of-way or easement operated and maintained by the city, county or state.

"Record drawings" means a set of engineering or site drawings that show how the project was constructed and what materials were used. Record drawings are signed and dated by the project engineer.

"Restoration" means the process of returning a disturbed or altered area or feature to a previously existing natural condition. Restoration activities reestablish the structure, function, and/or diversity to that which occurred prior to impacts caused by human activity.

"Right-of-way" means all land, or interest therein, which by deed, conveyance, agreement, easement, dedication, usage or process of law is reserved for, or dedicated to, the use of the general public.

"Sedimentation" means the process of gravity deposition of water suspended matter; the process of depositing soil particles, clays, sands and other sediment that were picked up by stormwater runoff.

"Solid waste storage area" means a place where solid waste containers are stored. Solid waste containers include trash compactors, solid waste dumpsters and garbage cans.

"Stormwater" means the surface water runoff that results from all natural forms of precipitation.

"Stormwater facility" means a component of a man-made drainage feature, or features designed or constructed to perform a particular function or multiple functions related to stormwater management. Includes, but is not limited to, pipes, swales, ditches, culverts, street gutters, rain gardens, pervious pavements, green roofs, ponds, constructed wetlands, infiltration devices, catch basins, oil/water separators and sediment basins. Stormwater facilities shall not include building gutters, downspouts, and drains serving one single-family residence.

"Stormwater management" means a program to provide surface water quality and quantity controls through structural and non-structural methods and capital improvement projects. Nonstructural controls include, but are not limited to, maintenance of stormwater facilities, public education, water quality monitoring, and preparation of agreements, ordinances, and regulations.

"Stormwater quality control" means the control of the introduction of pollutants into stormwater and the process of separating pollutants from stormwater.

"Stormwater quantity control" means the control of the rate and/or volume of stormwater released from a development site.

Oregon
Theodore R. Kulongoski, Governor

Department of Land Conservation and Development
635 Capitol Street, Suite 150
Salem, OR 97301-2540
(503) 373-0050
Fax (503) 378-5518
www.lcd.state.or.us

NOTICE OF ADOPTED AMENDMENT

8/2/2010

TO: Subscribers to Notice of Adopted Plan or Land Use Regulation Amendments

FROM: Plan Amendment Program Specialist

SUBJECT: City of Oregon City Plan Amendment
DLCD File Number 003-08

The Department of Land Conservation and Development (DLCD) received the attached notice of adoption. Due to the size of amended material submitted, a complete copy has not been attached. A Copy of the adopted plan amendment is available for review at the DLCD office in Salem and the local government office.

Appeal Procedures*

DLCD ACKNOWLEDGMENT or DEADLINE TO APPEAL: Friday, August 13, 2010

This amendment was submitted to DLCD for review prior to adoption pursuant to ORS 197.830(2)(b) only persons who participated in the local government proceedings leading to adoption of the amendment are eligible to appeal this decision to the Land Use Board of Appeals (LUBA).

If you wish to appeal, you must file a notice of intent to appeal with the Land Use Board of Appeals (LUBA) no later than 21 days from the date the decision was mailed to you by the local government. If you have questions, check with the local government to determine the appeal deadline. Copies of the notice of intent to appeal must be served upon the local government and others who received written notice of the final decision from the local government. The notice of intent to appeal must be served and filed in the form and manner prescribed by LUBA, (OAR Chapter 661, Division 10). Please call LUBA at 503-373-1265, if you have questions about appeal procedures.

*NOTE: The Acknowledgment or Appeal Deadline is based upon the date the decision was mailed by local government. A decision may have been mailed to you on a different date than it was mailed to DLCD. As a result, your appeal deadline may be earlier than the above date specified. NO LUBA Notification to the jurisdiction of an appeal by the deadline, this Plan Amendment is acknowledged.

Cc: Dan Drentlaw, City of Oregon City
Gloria Gardiner, DLCD Urban Planning Specialist
Jennifer Donnelly, DLCD Regional Representative
Amanda Punton, DLCD Regional Representative
Bill Holmstrom, DLCD Regional Representative

<paa> YA

FORM 2 DLCD Notice of Adoption

This Form 2 must be mailed to DLCD within **5-Working Days after the Final Ordinance is signed** by the public Official Designated by the jurisdiction and all other requirements of ORS 197.615 and OAR 660-018-000

☐ In person ☐ electronic ☐ mailed

DATE STAMP

DEPT OF

JUL 23 2010

LAND CONSERVATION AND DEVELOPMENT

For Office Use Only

Jurisdiction: **City of Oregon City**

Local file number: **L 08-01**

Date of Adoption: **July 7, 2010**

Date Mailed: **July 23, 2010**

Was a Notice of Proposed Amendment (Form 1) mailed to DLCD? ☒ Yes ☐ No Date: 12/16/2009

☐ Comprehensive Plan Text Amendment

☐ Comprehensive Plan Map Amendment

☒ Land Use Regulation Amendment

☐ Zoning Map Amendment

☒ New Land Use Regulation

☒ Other: Slope and Geology Map

Summarize the adopted amendment. Do not use technical terms. Do not write "See Attached".

In 2009 the city adopted code to address and implement the Beavercreek and Park Place Concept Plans, Metro's Title 11, general Zoning and Development Code updates and limited upzoning in exisiting residential neighborhoods. The code amendments were adopted on July 1, 2009 and became effective on July 31, 2009, with the passage of Ordinance 08—1014. The ordinance additionally setup a six-month update process to review the code language to determine if any sections needed revisions.

Does the Adoption differ from proposal? Yes, Please explain below:

Revised standards and procedures for landscaping and tree protection, neighborhood association noticing, tribal notification, natural resource area protection, geologic hazards, flood management, design review, master plans, and telecommunication facilities.

Plan Map Changed from: **varies** to: **varies**

Zone Map Changed from: **varies** to: **varies**

Location: **city-wide** Acres Involved: **0**

Specify Density: Previous: **varies** New: **varies**

Applicable statewide planning goals:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☐	☐

Was an Exception Adopted? ☐ YES ☒ NO

Did DLCD receive a Notice of Proposed Amendment:

45-days prior to first evidentiary hearing?	☒ **Yes**	☐ **No**
If no, do the statewide planning goals apply?	☐ **Yes**	☐ **No**
If no, did Emergency Circumstances require immediate adoption?	☐ **Yes**	☐ **No**

DLCD file No. 003-08 (17011) [16243]

Please list all affected State or Federal Agencies, Local Governments or Special Districts:

ODOT, METRO, Clackamas County, South Fork Water Board, Clackamas River Water District

Local Contact: **Tony Konkol, Director** Phone: **(503) 496-1562** Extension:

Address: **221 Molalla Ave, Ste. 200** Fax Number: **503-722-3880**

City: **Oregon City, OR** Zip: **97045** E-mail Address: **tkonkol@orcity.org**

ADOPTION SUBMITTAL REQUIREMENTS

This Form 2 must be received by DLCD no later than 5 days after the ordinance has been signed by the public official designated by the jurisdiction to sign the approved ordinance(s)
per ORS 197.615 and OAR Chapter 660, Division 18

1. This Form 2 must be submitted by local jurisdictions only (not by applicant).
2. When submitting, please print this **Form 2** on light **green paper if available**.
3. Send this Form 2 and **One (1) Complete Paper Copy and One (1) Electronic Digital CD** (documents and maps) of the Adopted Amendment to the address in number 6:
4. **Electronic Submittals: Form 2 – Notice of Adoption will not be accepted via email or any electronic or digital format at this time.**
5. The Adopted Materials must include the final decision signed by the official designated by the jurisdiction. The Final Decision must include approved signed ordinance(s), finding(s), exhibit(s), and any map(s).
6. **DLCD Notice of Adoption must be submitted in One (1) Complete Paper Copy and One (1) Electronic Digital CD via United States Postal Service, Common Carrier or Hand Carried to the DLCD Salem Office and stamped with the incoming date stamp.** (for submittal instructions, also see # 5)] **MAIL** the **PAPER COPY and CD** of the Adopted Amendment to:

ATTENTION: PLAN AMENDMENT SPECIALIST
DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT
635 CAPITOL STREET NE, SUITE 150
SALEM, OREGON 97301-2540

7. Submittal of this Notice of Adoption must include the signed ordinance(s), finding(s), exhibit(s) and any other supplementary information (see ORS 197.615).
8. Deadline to appeals to LUBA is calculated **twenty-one (21) days** from the receipt (postmark date) of adoption (see ORS 197.830 to 197.845).
9. In addition to sending the Form 2 - Notice of Adoption to DLCD, please notify persons who participated in the local hearing and requested notice of the final decision at the same time the adoption packet is mailed to DLCD (see ORS 197.615).
10. **Need More Copies?** You can now access these forms online at **http://www.lcd.state.or.us/**. You may also call the DLCD Office at (503) 373-0050; or Fax your request to: (503) 378-5518.

ORDINANCE NO. 10-1003

AN ORDINANCE OF THE CITY OF OREGON CITY ADOPTING AMENDMENTS TO TITLES 12, 13, 16, and 17 OF THE OREGON CITY MUNICIPAL CODE

WHEREAS, the development regulation sections of the Municipal Code (found in Titles 12, 13, 16, and 17) are comprised of standards governing zoning, site development, land division, street design, architectural review, parking, signs, natural resources, hillside development, home occupations, variances and other similar topics; and

WHEREAS, these standards reflect the vision for the future development of Oregon City, implement our Comprehensive Plan, and allow the City to manage future growth effectively. The Municipal Code and associated zoning maps are periodically reviewed and updated. This was a collaborative process whereby the City worked with interested citizens to improve the economic health and livability of the City. After over a year of review by the public, Planning Commission, and elected officials, the code amendments were adopted on July 1, 2009 and became effective on July 31, 2009, with the passage of Ordinance 08-1014; and

WHEREAS, Ordinance 08-1014 additionally setup a six-month update process to review the code language to determine if any sections needed revisions or adjustments that were unforeseen. At the end of the hearing adopting Ordinance 08-1014, the City Commission also directed staff to study some outstanding issues and bring them back during the 6-month review. The Planning Commission met on November 23, 2009, January 25, 2010, February 8, 2010, and February 22, 2010 to review the proposed code amendments.

WHEREAS, the Planning Commission, based on the oral and written testimony they received at the public hearings, adopted minor revisions to the Zoning and Development Code and unanimously recommended that the City Commission adopt the revisions; and

WHEREAS, the City Commission additionally reviewed the creation of the Oregon City Municipal Code section 17.44 Geologic Hazards Overlay District Map that was previously outlined in code but did not exist in map form and;

WHEREAS, the amended Zoning and Development Codes complies and is consistent with state statutes, Statewide Planning Goals, the amended Oregon City Comprehensive Plan, the Downtown Community Plan, the Metro Regional Framework Plan, the Oregon City Transportation System Plan, and the Oregon City Park and Recreation Master Plan; and

WHEREAS, the City Commission, based on the oral and written testimony they received at the public hearings, adopted revisions to the Development Code; and

WHEREAS, adopting the revisions to the Development Code is in the best interest of Oregon City to ensure that the goals and policies of the City can be realized.

NOW, THEREFORE, OREGON CITY ORDAINS AS FOLLOWS:

Section 1. The amendments to the Oregon City Zoning and Development Codes, as provided in Exhibit 1, are hereby adopted based on the findings contained in the Staff Report.

Section 2. The Oregon City Geological Hazards Overlay Map, attached as Exhibit 2, is hereby adopted.

Read for the first time at a regular meeting of the City Commission held on the 16th day of June, 2010, and the City Commission finally enacted the foregoing ordinance this 7th day of July, 2010.

ALICE NORRIS, Mayor

Attested to this 7th day of July 2010

Nancy Ide, City Recorder

Approved as to legal sufficiency:

City Attorney

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

NOTICE OF DECISION

Date: July 23, 2010

FILE NO.: L 08-01 (6-month update)

APPLICATION TYPE: Legislative

APPLICANTS/ OWNERS: City of Oregon City
PO Box 3040
625 Center Street
Oregon City, Oregon 97045

REQUEST: General Code Updates to Chapters 12, 6, and 17 of the Oregon City Municipal Code, Comprehensive Plan Map Amendments, Zone Changes.

LOCATION: City Wide.

REVIEWER: Tony Konkol, Community Development Director

DECISION: After reviewing all of the evidence in the record and considering all of the arguments made by the applicant and citizens, the City Commission concluded that adoption of the code amendments met all of the requirements of each applicable section of the Oregon City Municipal Code and Oregon City Comprehensive Plan and **APPROVED** Ordnance 10-1003.

Legislative actions involve the adoption or amendment of the city's land use regulations, comprehensive plan, maps, inventories and other policy documents that affect the entire city or large portions of it. Legislative actions which affect land use must begin with a public hearing before the planning commission.

B. Planning Commission Review.

1. Hearing Required. The planning commission shall hold at least one public hearing before recommending action on a legislative proposal. Any interested person may appear and provide written or oral testimony on the proposal at or prior to the hearing. The planning manager shall notify the Oregon Department of Land Conservation and Development (DLCD) as required by the post-acknowledgment procedures of ORS 197.610 to 197.625, as applicable.
2. Planning Manager's Report. Once the planning commission hearing has been scheduled and noticed in accordance with Section 17.50.090(C) and any other applicable laws, the planning manager shall prepare and make available a report on the legislative proposal at least seven days prior to the hearing.
3. Planning Commission Recommendation. At the conclusion of the hearing, the planning commission shall adopt a recommendation on the proposal to the city commission. The planning commission shall make a report and recommendation to the city commission on all legislative proposals. If the planning commission recommends adoption of some form of the proposal, the planning commission shall prepare and forward to the city commission a report and recommendation to that effect.

C. City Commission Review.

1. City Commission Action. Upon a recommendation from the planning commission on a legislative action, the city commission shall hold at least one public hearing on the proposal. Any interested person may provide written or oral testimony on the proposal at or prior to the hearing. At the conclusion of the hearing, the city commission may adopt, modify or reject the legislative proposal, or it may remand the matter to the planning commission for further consideration. If the decision is to adopt at least some form of the proposal, and thereby amend the city's land use regulations, comprehensive plan, official zoning maps or some component of any of these documents, the city commission decision shall be enacted as an ordinance.
2. Notice of Final Decision. Not later than five days following the city commission final decision, the planning manager shall mail notice of the decision to DLCD in accordance with ORS 197.615(2). (Ord. 98-1008 §1(part), 1998)

The city commission decision is the city's final decision and is appealable to the land use board of appeals (LUBA) within twenty-one days of when it becomes final. The application, decision, and supporting documents are available for inspection at the Oregon City Planning Division located at 320 Warner-Milne Road, Oregon City, OR 97045, (503) 657-0891, between the hours of 8am and 1pm. Copies of these documents are available (for a fee) upon request.

OREGON CITY

Community Development – Planning

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FILE NO.:	L 08-01 6-Month Development Code Update
APPLICATION TYPE:	Legislative
HEARING DATE:	February 22, 2010 – 7:00 p.m., City Hall Oregon City, OR 97045
APPLICANTS/	City of Oregon City
REQUEST:	General Code Updates to Chapters 12, 6, and 17 of the Oregon City Municipal Code, Comprehensive Plan Map Amendments, Zone Changes.
LOCATION:	City-Wide
REVIEWERS:	Tony Konkol, Community Development Director Christina Robertson-Gardiner, AICP Associate Planner Pete Walter, AICP, Associate Planner Laura Butler, AICP Assistant Planner Bob Cullison, Community Services Manager Nancy Kraushaar, City Engineer/Public Works Director
RECOMMENDATION:	Staff recommends approval of this application based on the satisfaction of all required criteria for a Legislative action.

OCMC 17.50.170 -- Legislative Hearing Process.

A. Purpose. Legislative actions involve the adoption or amendment of the city's land use regulations, comprehensive plan, maps, inventories and other policy documents that affect the entire city or large portions of it. Legislative actions which affect land use must begin with a public hearing before the planning commission.

B. Planning Commission Review.

1. Hearing Required. The planning commission shall hold at least one public hearing before recommending action on a legislative proposal. Any interested person may appear and provide written or oral testimony on the proposal at or prior to the hearing. The planning manager shall notify the

Oregon Department of Land Conservation and Development (DLCD) as required by the post-acknowledgment procedures of ORS 197.610 to 197.625, as applicable.

2. The Community Development Director's Report. Once the planning commission hearing has been scheduled and noticed in accordance with Section 17.50.090C. and any other applicable laws, the community development director shall prepare and make available a report on the legislative proposal at least seven days prior to the hearing.
3. Planning Commission Recommendation. At the conclusion of the hearing, the planning commission shall adopt a recommendation on the proposal to the city commission. The planning commission shall make a report and recommendation to the city commission on all legislative proposals. If the planning commission recommends adoption of some form of the proposal, the planning commission shall prepare and forward to the city commission a report and recommendation to that effect.

C. City Commission Review.

1. City Commission Action. Upon a recommendation from the planning commission on a legislative action, the city commission shall hold at least one public hearing on the proposal. Any interested person may provide written or oral testimony on the proposal at or prior to the hearing. At the conclusion of the hearing, the city commission may adopt, modify or reject the legislative proposal, or it may remand the matter to the planning commission for further consideration. If the decision is to adopt at least some form of the proposal, and thereby amend the city's land use regulations, comprehensive plan, official zoning maps or some component of any of these documents, the city commission decision shall be enacted as an ordinance.
2. Notice of Final Decision. Not later than five days following the city commission final decision, the planning manager shall mail notice of the decision to DLCD in accordance with ORS 197.615(2). (Ord. No. 08-1014, §§ 1—3 (Exhs. 1—3), 7-1-2009).

IF YOU HAVE ANY QUESTIONS ABOUT THIS APPLICATION, PLEASE CONTACT TONY KONKOL IN THE PLANNING DIVISION OFFICE AT 657-0891.

A. PROPOSED PROJECT

This "6-month update" project provides needed updates to the development regulation sections of the Oregon City Municipal Code adopted July 31, 2009 (primarily found in Chapters 12, 15, 16, and 17).

LOCATION

City-wide. Legislative actions involve the adoption or amendment of the city's land use regulations, comprehensive plan, maps, inventories and other policy documents that affect the entire city or large portions of it.

B. PUBLIC NOTICE

The Planning Commission reviewed the amendments at five meetings beginning on November 23, 2009. The Planning Commission agendas and proposed code amendments' were sent to the Citizen Involvement Council (CIC), available online though streaming video at www.orcity.org as well as on a project website on the City's Planning Division home page. Since this project is a continuation of Legislative File L 08-01 per the requirements set out in Ordinance. 1014, no additional Measure 56 noticing is required.

C. BACKGROUND

The development regulation sections of the Municipal Code (primarily found in Chapters 12, 15, 16, and 17) are comprised of standards which govern zoning, site development, land division, street design, tree protection, architectural review, parking, signs, overlay districts (geologic hazards, flood plains, and water quality and habitat resources), home occupations, variances and other similar topics.

These standards reflect our future vision for the development of Oregon City, implement our Comprehensive Plan, and allow us to manage future growth effectively. The Municipal Code and associated zoning maps are periodically reviewed and updated to respond to City needs and statewide goals. The most recent update was a collaborative process whereby we worked together to improve the economic health and livability of the City. After over a year of review by the public, Planning Commission, and elected officials, the code amendments were adopted on July 1, 2009 and became effective on July 31, 2009, with the passage of Ordinance No. 08—1014 (Exhibit 5).

Ord. 08-1014 additionally setup a six-month update process to review the adopted code language to determine if any sections needed revisions or tweaks that were unforeseen. The Ordinance set forth November 9th, 2009 for the Planning Commission initial public hearing, and January 20th, 2010 for the City Commission initial public hearing to review the 6-month updates. No additional Measure 56 or Land Use noticing was required. At the end of the hearing process adopting Ord. 08-1014, the City Commission also directed staff to study some outstanding development regulation issues and bring back further information to consider during the six-month update process.

The Planning Commission reviewed the code amendments at the 11.23.09, 12.14.09, 1.11.10 1.20.10 and 2.22.10 meetings. The City Commission will review the proposed amendments in March and April, 2010.

Copies of the updated draft code can be found in Exhibit 3. Summary descriptions of the changes to each code can be found in Exhibit 2.

DECISION-MAKING CRITERIA: CHAPTER 17.68 ZONING CHANGES AND AMENDMENTS

17.68.010 Initiation of the amendment.

A text amendment to this title or the comprehensive plan, or an amendment to the zoning map or the comprehensive plan map, may be initiated by:

- *A. A resolution by the commission;*
- *B. An official proposal by the planning commission;*
- *C. An application to the planning division presented on forms and accompanied by information prescribed by the planning commission.*

All requests for amendment or change in this title shall be referred to the planning commission.

Finding: the City Commission directed the request for text amendments to the Municipal Code, through the adopted Ordinance 08-1014. Planning Commission review of the code changes commenced on November 23, 2009.

17.68.020 Criteria.

The criteria for a zone change are set forth as follows:

A. The proposal shall be consistent with the goals and policies of the comprehensive plan.

Goal 1.2 Community and Comprehensive Planning

Ensure that citizens, neighborhood groups, and affected property owners are involved in all phases of the comprehensive planning program.

Finding: The Planning Commission held five hearings over a period of three months to discuss the proposed changes in detail. A project website was created on the city's website that tracked all proposed code amendments. Additionally, All Planning Commission packets were made available on the City's website and links were emailed to the CIC and all Neighborhood Association Land Use chairs.

Goal 2.1 Efficient Use of Land

Ensure that property planned for residential, commercial, office, and industrial uses is used efficiently and that land is developed following principles of sustainable development.

Finding: The over-arching goal of the proposed code changes is to ensure land inside city limits is developed in a more sustainable and efficient manner. These efforts can be found throughout the code chapters, from the revised Natural Resources Overlay District in Chapter 17.49 and Tree Protection regulations in Chapter 17.41, to stricter design guidelines that promote better pedestrian connections. The regulations have also been revised in anticipation of the passage of new Low Impact Development (LID) and Stormwater Design standards which are being drafted for adoption by the City Commission in 2010, and provide specific incentives and cross-references to those standards in the parking lot, landscaping and street design standards of the code (Chapters 17.52, 17.62 and 12.04, respectively).

Goal 2.3 Corridors
Focus transit-oriented, higher intensity, mixed-use development along selected transit corridors.

Finding: The revisions to OCMC 17.62 Site Plan and Design Review and OCMC 07.52 Off Street Parking and loading provide additional flexibility for staff and developers, yet at the same time raise the minimum design threshold of buildings to ensure that the new developments and additions along transit corridors produce buildings that are well designed, promote multi-model travel and have a long lifespan.

Goal 2.4 Neighborhood Livability
Provide a sense of place and identity for residents and visitors by protecting and maintaining neighborhoods as the basic unit of community life in Oregon City while implementing the goals and policies of the other sections of the Comprehensive Plan.

Finding: In Oregon, we have made a commitment to accommodate growth within the urban growth boundary (UGB), rather than develop the adjacent county with low-density homes and businesses. Land inside the urban growth boundary includes cities and services such as water and sewer systems, parks, schools and fire and police protection while land outside the boundary is primarily rural residential, farm and forest use. The urban growth boundary is one of the tools managed by Metro, our regional government, to protect farms and forests from urban development and to promote the efficient use of land, public facilities and services inside the boundary. Amendments to the development regulations of the Municipal Code continue the city's effort to create design guidelines that promote better pedestrian connections, protect habitat, promote tree protection, raise the quality of development and promote the efficient use of land.

Goal 2.6 Industrial Land Development
Ensure an adequate supply of land for major industrial employers with family-wage jobs.

Finding: The proposed code changes will not materially affect the existing inventory of industrially designated lands. No lands that are currently zoned for industrial used are being proposed for rezoning with this 6-month update.

Goal 5.1 Open Space
Establish an open space system that conserves fish and wildlife habitat and provides recreational opportunities, scenic vistas, access to nature and other community benefits.

Finding: In accordance with Metro Title 3, Water Quality, and Metro Title 13, Nature in the Neighborhoods, adoption of the revised code chapter 17.49, Natural Resource Overlay District, assures that key habitat fish and wildlife habitat areas throughout the city are protected as one contiguous system and that new development minimizes and mitigates disturbances to these sensitive areas. The mapping of these areas has been refined and improved using more accurate slope data. Along with the city's park and trail system, these areas provide recreational opportunities, scenic vistas, access to nature and other community benefits. The recent code revisions clarify the review process for development in or abutting these areas, and provide clear and objective criteria for approval and mitigation requirements.

Goal 5.2 Scenic Views and Scenic Sites
Protect the scenic qualities of Oregon City and scenic views of the surrounding landscape.

Finding: Adoption of the revised natural resource overlay district in OCMC 17.49, the Tree Protection code in OCMC 17.44, along with the existing Willamette River Greenway overlay district, assures that the municipal code continues to protect scenic views.

Goal 5.4 Natural Resources
Identify and seek strategies to conserve and restore Oregon City's natural resources, including air, surface and subsurface water, geologic features, soils, vegetation, and fish and wildlife, in order to sustain quality of life for current and future citizens and visitors, and the long-term viability of the ecological systems.

Finding: In accordance with Metro Title 3, Water Quality, and Metro Title 13, Nature in the Neighborhoods, adoption of the revised code chapter 17.49, Natural Resource Overlay District, assures that key habitat fish and wildlife habitat areas throughout the city are protected as one contiguous system and that new development minimizes and mitigates disturbances to these sensitive areas. The mapping of these areas has been refined and improved using more accurate slope (LIDAR) data. Along with the city's park and trail system, these areas provide recreational opportunities, scenic vistas access to nature and other community benefits.

Goal 7.1 Natural Hazards
Protect life and reduce property loss from the destruction associated with natural hazards

Finding: Revisions to the Geologic Hazard Overlay District zoning regulations, along with refined and improved slope (LIDAR) data, continue to protect geologic hazard areas and steep slopes and that development in or adjacent to such areas is safely designed and engineered, when permitted.

Goal 9.1 Improve Oregon City's Economic Health
Provide a vital, diversified, innovative economy including an adequate supply of goods and services and employment opportunities to work toward an economically reasonable, ecologically sound and socially equitable economy.

Finding: The proposed code amendments are intended to assure that commercially and industrially zoned land is provided in appropriate locations throughout the city, are built to urban standards and which promote multi-modal and sustainable land use. Most importantly, many of the proposed amendments allow the Community Development Director to approve alternative plans that can also meet the adopted standards, such as through the use of Low Impact Development techniques to improve storm water management. This level of flexibility is important to developers and business owners when choosing to develop or expand existing businesses within the city.

Goal 10.1 Diverse Housing Opportunities
Provide for the planning, development and preservation of a variety of housing types and lot sizes.

Finding: Through the revisions to the cottage housing and tree protection and natural resource regulations, a diversity of housing stock can be maintained. These chapters look to integrate lot sizes throughout the single family development areas and provide incentives such as greater flexibility in dimensional standards to improve site design. Multi-family design regulations have been adopted that require diversity in unit types. Segregation of lot sizes and housing types are being relaxed in order to protect trees and provide for alternative housing opportunities.

Goal 10.2 Supply of Affordable Housing
Provide and maintain an adequate supply of affordable housing.

Finding: The revisions to the Cottage housing chapter will continue to provide an option for a residential product that will provide an "age-in-place" affordable housing alternative for many segments of Oregon City's population. The new R-5 zone district, along with the R-2 and R-3.5 Dwelling Districts provide development opportunities for multi-family and more affordable single family detached and attached housing units.

Goal 11.1 Provision of Public Facilities
Serve the health, safety, education, welfare, and recreational needs of all Oregon City residents through the planning and provision of adequate public facilities

Finding: Many of the code changes being proposed encourage development adjacent to existing developed areas, thereby reducing costly public facilities extensions.

Goal 11.4 Stormwater Management
Seek the most efficient and economical means available for constructing, operating, and maintaining the City's stormwater management system while protecting the environment and meeting regional, state, and federal standards for protection and restoration of water resources and fish and wildlife habitat.

Finding: The public works department has completed a final draft of revisions to the City's stormwater and low impact development standards. These standards include a variety of techniques to minimize impacts to the city stormwater system through a combination of techniques such as vegetated swales, rain gardens, green roofs, pervious pavers and other techniques to manage stormwater naturally.

Goal 11.6 Transportation Infrastructure
Optimize the City's investment in transportation infrastructure.

Finding: Many of the code changes being proposed encourage development adjacent to existing developed areas and along existing transportation corridors, thereby reducing costly public facilities extensions.

Goal 12.1 Land Use-Transportation Connection
Ensure that the mutually supportive nature of land use and transportation is recognized in planning for the future of Oregon City.

Finding: The proposed code amendments are consistent with the 2001- Transportation System Plan. The Land Use and transportation hierarchy remains the same.

Goal 12.3 Multi-Modal Travel Options
Develop and maintain a transportation system that provides and encourages a variety of multi-modal travel options to meet the mobility needs of all Oregon City residents.

Finding: The revisions to OCMC 17.62 Site Plan and Design Review and OCMC 07.52 Off Street Parking and Loading provide additional flexibility for staff and developers yet at the same time raise the minimum design threshold of buildings to ensure that the new developments and

additions along transit corridors produce buildings that are well designed, promote multi-model travel and have a long lifespan.

Goal 12.6 Capacity
Develop and maintain a transportation system that has enough capacity to meet users' needs.

Finding: Transportation standards will be applied proportionally to off-set the impacts of new development and assure the development of a contiguous, safe and efficient multi-modal transportation system.

Goal 12.7 Sustainable Approach
Promote a transportation system that supports sustainable practices.

Finding: Sustainable transportation practices are inherent throughout the code amendments. They aim at fully utilizing the existing commercial and residential transportation infrastructure. The revisions to OCMC 17.62 Site Plan and Design Review and OCMC 07.52 Off Street Parking and loading provide additional flexibility for staff and developers yet at the same time raise the minimum design threshold of buildings to ensure that the new developments and additions along transit corridors produce buildings that are well designed, promote multi-model travel and have a long lifespan. The regulations have also been revised in anticipation of the passage of new Low Impact Development (LID) and Stormwater Design standards which are being drafted for adoption by the City Commission in 2010, and provide specific incentives and cross-references to those standards in the parking lot, landscaping and street design standards of the code.

B. That public facilities and services (water, sewer, storm drainage, transportation, schools, police and fire protection) are presently capable of supporting the uses allowed by the zone, or can be made available prior to issuing a certificate of occupancy. Service shall be sufficient to support the range of uses and development allowed by the zone.

Finding: No changes to the Oregon City Zoning map or Comprehensive Plan map are being proposed at this time.

C. The land uses authorized by the proposal are consistent with the existing or planned function, capacity and level of service of the transportation system serving the proposed zoning district.

Finding: The proposed land use code amendments are intended to ensure that the transportation system is utilized as efficiently and safely as possible. As infill occurs, the standards will be applied proportionally to off-set the impacts of new development and assure the development of a contiguous, safe and efficient multi-modal transportation system.

D. Statewide planning goals shall be addressed if the comprehensive plan does not contain specific policies or provisions which control the amendment.

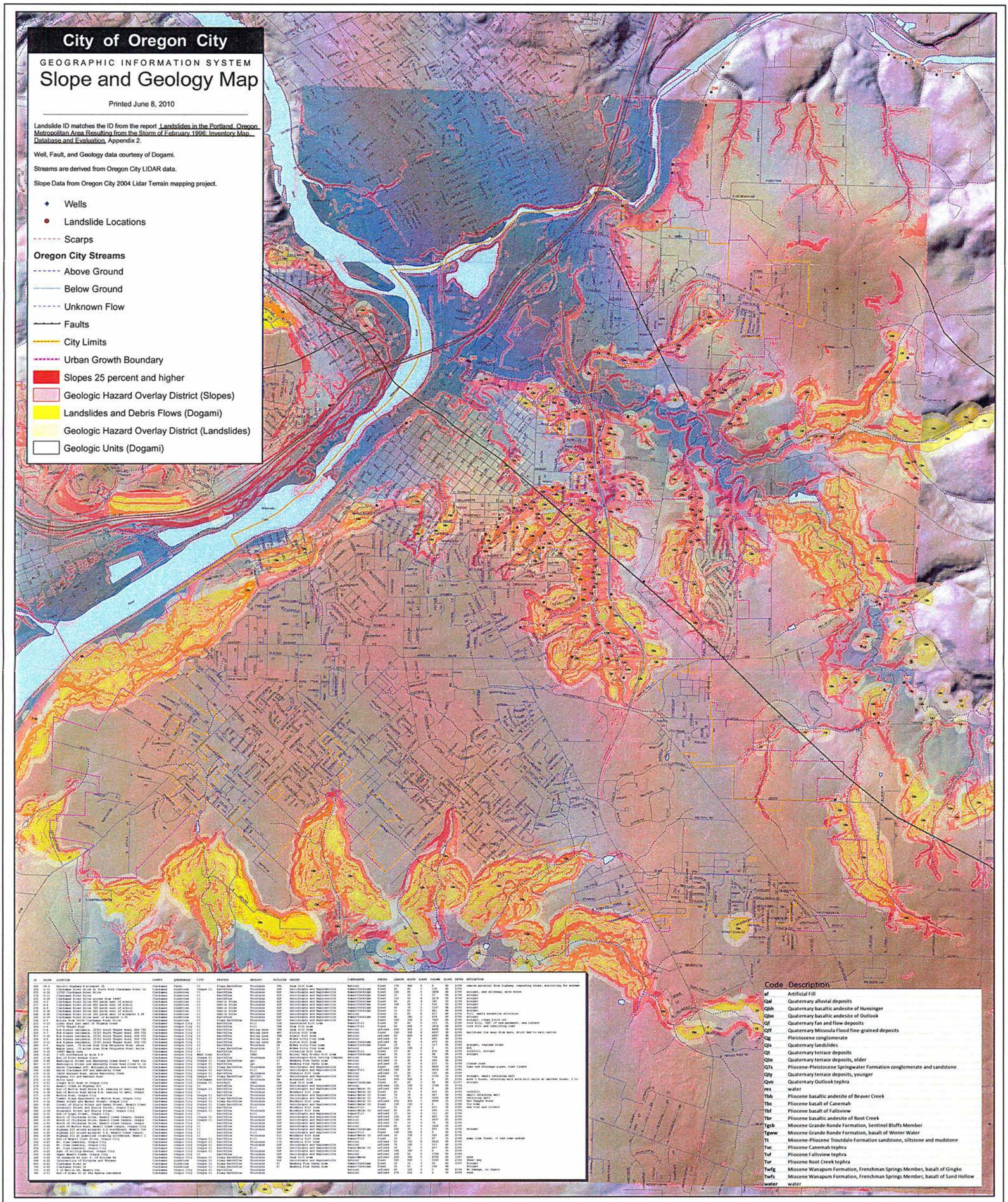
Finding: This criterion is not applicable. The Oregon City Comprehensive Plan addresses the Statewide Planning goals.

RECOMMENDATION

Staff recommends that the Planning Commission recommend approval of the Municipal Code text amendments, Zone to the City Commission as included in Exhibits 3 for their consideration at the March 17, 2010 City Commission hearing.

EXHIBITS

1. Draft Ordinance 10-03 (will be presented at 3.17.10 CC meeting)
2. Memo Describing Proposed Amendments
3. Proposed Municipal Code Amendments by Chapter
4. Planning Commission packets, minutes, video, oral comment cards (on file)
    a. November 23, 2009 PC Hearing
    b. December 11, 2009 PC Hearing
    c. January 25, 2010 PC Hearing
    d. February 8, 2010 PC Hearing
5. ORD 08-1014 (will be presented at 3.17.10 CC meeting)
6. L 08-01 (on file)



Code	Description
af	Artificial Fill
Qal	Quaternary alluvial deposits
Qbh	Quaternary basaltic andesite of Hunsinger
Qbo	Quaternary basaltic andesite of Outlook
Qf	Quaternary fan and flow deposits
Qff	Quaternary Missoula Flood fine-grained deposits
Qg	Pleistocene conglomerate
Qls	Quaternary landslides
Qt	Quaternary terrace deposits
Qto	Quaternary terrace deposits, older
QTs	Pliocene-Pleistocene Springwater Formation conglomerate and sandstone
Qty	Quaternary terrace deposits, younger
Qvo	Quaternary Outlook tephra
res	water
Tbb	Pliocene basaltic andesite of Beaver Creek
Tbc	Pliocene basalt of Canemah
Tbf	Pliocene basalt of Fallsview
Tbr	Pliocene basaltic andesite of Root Creek
Tgsb	Miocene Grande Ronde Formation, Sentinel Bluffs Member
Tgww	Miocene Grande Ronde Formation, basalt of Winter Water
Tt	Miocene-Pliocene Troutdale Formation sandstone, siltstone and mudstone
Tvc	Pliocene Canemah tephra
Tvf	Pliocene Fallsview tephra
Tvr	Pliocene Root Creek tephra
Twfg	Miocene Wanapum Formation, Frenchman Springs Member, basalt of Gingko
Twfs	Miocene Wanapum Formation, Frenchman Springs Member, basalt of Sand Hollow
water	water

The City of Oregon City makes no representations, express or implied, as to the accuracy, completeness and timeliness of the information displayed. This map is not suitable for legal, engineering, or surveying purposes. Notification of any errors is appreciated.

Please recycle with colored office grade paper.

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OREGON CITY

Plot date: June 8, 2010
Map name: Slope and Geology Map 20100908.mxd
Plot name: Slope and geology Map 30x48 20100908.pdf

Amendments to the Oregon City Municipal Code

City of Oregon City

Planning Division

Tony Konkol – Community Development Director

For more information, contact:
Pete Walter, AICP, Associate Planner
Christina Robertson-Gardiner, AICP, Associate Planner
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The Planning Division is committed to providing equal access to information and hearings. For equal access to information, call the Planning Division at (503) 722-3789.

Version 1.5 (Final)

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Oregon City Municipal Code
Chapter 12.04 Streets Sidewalks and Public Places

12.04.005 Jurisdiction and management of the public rights-of-way.

A. The city has jurisdiction and exercises regulatory management over all public rights-of-way within the city under authority of the City Charter and state law by issuing separate Public Works right-of-way permits or permits as part of issued public infrastructure construction plans. No work in the public right-of-way shall be done without the proper permit. Some public rights-of-way within the City are regulated by the State of Oregon Department of Transportation (ODOT) or Clackamas County and as such, any work in these streets shall conform to their respective permitting requirements.
B. Public rights-of-way include, but are not limited to, streets, roads, highways, bridges, alleys, sidewalks, trails, paths, public easements and all other public ways or areas, including the subsurface under and air space over these areas.
C. The city has jurisdiction and exercises regulatory management over each public right-of-way whether the city has a fee, easement, or other legal interest in the right-of-way. The city has jurisdiction and regulatory management of each right-of-way whether the legal interest in the right-of-way was obtained by grant, dedication, prescription, reservation, condemnation, annexation, foreclosure or other means.
D. No person may occupy or encroach on a public right-of-way without the permission of the city. The city grants permission to use rights-of-way by franchises and permits.
E. The exercise of jurisdiction and regulatory management of a public right-of-way by the city is not official acceptance of the right-of-way, and does not obligate the city to maintain or repair any part of the right-of-way.

12.04.010 Construction specifications—Improved streets.
All sidewalks hereafter constructed in the city on improved streets shall be constructed to city standards and widths required in the Oregon City Transportation System Plan. The curb shall be constructed at the same time as the construction of the sidewalk and shall be located as provided in the ordinance authorizing the improvement of said street next proceeding unless otherwise ordered by the city commission. Both sidewalks and curbs are to be constructed according to plans and specifications provided by the city engineer.

12.04.020 Construction specifications—Unimproved streets.
Sidewalks constructed on unimproved streets shall be constructed of concrete according to lines and grades established by the city engineer and approved by the city commission. On unimproved streets curbs do not have to be constructed at the same time as the sidewalk.

12.04.25 Street design--Curb cuts.
A. To assure public safety, reduce traffic hazards and promote the welfare of pedestrians, bicyclists and residents of the subject area, such as a cul-de-sac or dead-end street, the decision maker shall be authorized to minimize the number and size of curb cuts (including driveways) as far as practicable where any of the following conditions are necessary:

1. To provide adequate space for on-street parking;
2. To facilitate street tree planting requirements;
3. To assure pedestrian and vehicular safety by limiting vehicular access points; and
4. To assure that adequate sight distance requirements are met.

Where the decision maker determines any of these situations exist or may occur due to approval of a proposed development, driveway curb cuts shall be limited to those widths as approved by the Public Works Street Standard Drawings. Shared residential driveways shall be limited to twenty-four feet in width adjacent to the sidewalk and property line and may extend to a maximum of thirty feet abutting the street

pavement to facilitate turning movements. Non-residential development driveway curb cuts in these situations shall be limited to those widths as approved by the Public Works Street Standard Drawings or as approved by the City Engineer upon review of the vehicle turning radii based on a professional engineer's design submittal.

B. Each new or redeveloped curb cut shall have an approved concrete approach or asphalted street connection where there is no concrete curb and a minimum hard surface for at least 10 feet and preferably 20 feet back into the lot as measured from the current edge of street pavement to provide for controlling gravel tracking onto the public street. The hard surface may be concrete, asphalt, or other surface approved by the City Engineer.

C. It shall be a code violation to drive vehicles, trailers, boats, or other wheeled objects across a sidewalk or roadside planter strip at a location other than an approved permanent or City-approved temporary driveway approach. Damages caused by such action shall be corrected by the adjoining property owner.

D. It shall be a code violation to place soil, gravel, wood, or other material in the gutter or space next to the curb of a public street with the intention of using it as a permanent or temporary driveway. Damages caused by such action shall be corrected by the adjoining property owner.

E. Any driveway built within public street or alley right-of-way shall be built and permitted per City requirements as approved by the City Engineer.

F. Exceptions. The Public Works Director reserves the right to waive this policy in certain instances, if it is determined through written findings, that it is in the best interest of the public to do so. Examples of allowable exceptions include:

1. Corner properties or properties adjacent to more than one street frontage provided at least one on-street parking space on each frontage remains available after the installation of a second driveway.
2. Special needs for disabled access.
3. When the size of the lot or the length of the street frontage is adequate to support more than one driveway, the installation of a driveway will result in the loss of no more than one on-street parking space and there is no shortage of on-street parking available for neighboring property.

In no case shall more than two driveways be allowed on any single family residential property.

G. Appeals. Decisions made by the Public Works Director are final unless appealed in writing to the Transportation Advisory Committee for review and recommendation to the City Commission.

H. Failure to Comply. Failure to meet the intent of this section shall be a violation of this Code and enforceable as a civil infraction.

12.04.030 Maintenance and repair.
The owner of land abutting the street where a sidewalk has been constructed shall be responsible for maintaining said sidewalk and abutting curb, if any, in good repair.

12.04.031 Liability for sidewalk injuries.
A. The owner or occupant of real property responsible for maintaining the adjacent sidewalk shall be liable to any person injured because of negligence of such owner or occupant in failing to maintain the sidewalk in good condition.
B. If the city is required to pay damages for an injury to persons or property caused by the failure of a person to perform the duty that this ordinance imposes, the person shall compensate the city for the amount of

the damages paid. The city may maintain an action in a court of competent jurisdiction to enforce this section.

12.04.032 Required sidewalk repair.

A. When the public works director determines that repair of a sidewalk is necessary he or she shall issue a notice to the owner of property adjacent to the sidewalk.

B. The notice shall require the owner of the property adjacent to the defective sidewalk to complete the repair of the sidewalk within ninety days after the service of notice. The notice shall also state that if the repair is not made by the owner, the city may do the work and the cost of the work shall be assessed against the property adjacent to the sidewalk.

C. The public works director shall cause a copy of the notice to be served personally upon the owner of the property adjacent to the defective sidewalk, or the notice may be served by registered or certified mail, return receipt requested. If after diligent search the owner is not discovered, the public works director shall cause a copy of the notice to be posted in a conspicuous place on the property, and such posting shall have the same effect as service of notice by mail or by personal service upon the owner of the property.

D. The person serving the notice shall file with the city recorder a statement stating the time, place and manner of service or notice.

12.04.033 City may do work.

If repair of the sidewalk is not completed within ninety days after the service of notice, the public works director shall carry out the needed work on the sidewalk. Upon completion of the work, the public works director shall submit an itemized statement of the cost of the work to the finance director. The city may, at its discretion, construct, repair or maintain sidewalks deemed to be in disrepair by the public works director for the health, safety and general welfare of the residents of the city.

12.04.034 Assessment of costs.

Upon receipt of the report, the finance director shall assess the cost of the sidewalk work against the property adjacent to the sidewalk. The assessment shall be a lien against the property and may be collected in the same manner as is provided for in the collection of street improvement assessment.

12.04.040 Streets--Enforcement.

Any person whose duty it is to maintain and repair any sidewalk, as provided by this chapter, and who fails to do so shall be subject to the enforcement procedures of Chapters 1.16, 1.20 and 1.24. Failure to comply with the provisions of this chapter shall be deemed a nuisance. Violation of any provision of this chapter is subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24.

12.04.045 Street Design--Constrained Local Streets and/or Rights-of-Way.

Any accessway with a pavement width of less than thirty-two feet shall require the approval of the City Engineer, Community Development Director and Fire Chief and shall meet minimum life safety requirements, which may include fire suppression devices as determined by the fire marshal to assure an adequate level of fire and life safety. The standard width for constrained streets is twenty feet of paving with no on-street parking and twenty-eight feet with on-street parking on one side only. Constrained local streets shall maintain a twenty-foot wide unobstructed accessway. Constrained local streets and/or right-of-way shall comply with necessary slope easements, sidewalk easements and altered curve radius, as approved by the City Engineer and Community Development Director.

Table 12.04.045

STREET DESIGN STANDARDS FOR LOCAL CONSTRAINED STREETS		
	Minimum	Required
Type of Street	Right-of-way	Pavement Width
Constrained local street	20 to 40	20 to less than 32 feet

12.04.050 Retaining walls--Required.
Every owner of a lot within the city, abutting upon an improved street, where the surface of the lot or tract of land is above the surface of the improved street and where the soil or earth from the lot, or tract of land is liable to, or does slide or fall into the street or upon the sidewalk, or both, shall build a retaining wall, the outer side of which shall be on the line separating the lot, or tract of land from the improved street, and the wall shall be so constructed as to prevent the soil or earth from the lot or tract of land from falling or sliding into the street or upon the sidewalk, or both, and the owner of any such property shall keep the wall in good repair.

12.04.060 Retaining walls--Maintenance.
When a retaining wall is necessary to keep the earth from falling or sliding onto the sidewalk or into a public street and the property owner or person in charge of that property fails or refuses to build such a wall, such shall be deemed a nuisance. The violation of any provision of this chapter is subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24.

12.04.070 Removal of sliding dirt.
It shall be the duty of the owner of any property as mentioned in Section 12.04.050, and in case the owner is a nonresident, then the agent or other person in charge of the same, to remove from the street or sidewalk or both as the case may be, any and all earth or dirt falling on or sliding into or upon the same from the property, and to build and maintain in order at all times, the retaining wall as herein required; and upon the failure, neglect or refusal of the land owner, the agent or person in charge of the same to clean away such earth or dirt, falling or sliding from the property into the street or upon the sidewalk, or both, or to build the retaining wall, shall be deemed guilty of a misdemeanor.

12.04.080 Excavations--Permit required.
It shall be unlawful for any person to dig up, break, excavate, disturb, dig under or undermine any public street or alley, or any part thereof or any macadam, gravel, or other street pavement or improvement without first applying for and obtaining from the engineer a written permit so to do.

12.04.090 Excavations--Permit restrictions.
The permit shall designate the portion of the street to be so taken up or disturbed, together with the purpose for making the excavation, the number of days in which the work shall be done, and the trench or excavation to be refilled and such other restrictions as may be deemed of public necessity or benefit.

12.04.095 Street Design – Curb Cuts.
To assure public safety, reduce traffic hazards and promote the welfare of pedestrians, bicyclists and residents of the subject area, such as a cul-de-sac or dead-end street, the decision maker shall be authorized to minimize the number and size of curb cuts (including driveways) as far as practicable where any of the following conditions are necessary:

A. To provide adequate space for on-street parking;
B. To facilitate street tree planting requirements;
C. To assure pedestrian and vehicular safety by limiting vehicular access points; and
D. To assure that adequate sight distance requirements are met.

Where the decision maker determines any of these situations exist or may occur due to approval of a proposed development, single residential driveway curb cuts shall be limited to 12 feet in width adjacent to the sidewalk and property line and may extend to a maximum of 18 feet abutting the street pavement to

facilitate turning movements. Shared residential driveways shall be limited to 24 feet in width adjacent to the sidewalk and property line and may extend to a maximum of 30 feet abutting the street pavement to facilitate turning movements. Non-residential development driveway curb cuts in these situations shall be limited to the minimum required widths based on vehicle turning radii based on a professional engineer's design submittal and as approved by the decision maker.

12.04.100 Excavations – Restoration of Pavement

Whenever any excavation shall have been made in any pavement or other street improvement on any street or alley in the city for any purpose whatsoever under the permit granted by the engineer, it shall be the duty of the person making the excavation to put the street or alley in as good condition as it was before it was so broken, dug up or disturbed, and shall remove all surplus dirt, rubbish, or other material from the street or alley.

12.04.110 Excavations--Nuisance--Penalty.

Any excavation in violation of this chapter shall be deemed a nuisance. Violation of any provision of this chapter is subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24.

12.04.120 Obstructions – Permit Required

A. Permanent Obstructions. It is unlawful for any person to place, put or maintain any obstruction, other than a temporary obstruction, as defined in subsection B of this section, in any public street or alley in the city, without obtaining approval for a right-of-way permit from the commission by passage of a resolution.

1. The city engineer shall provide applicants with an application form outlining the minimum submittal requirements.
2. The applicant shall submit at least the following information in the permitting process in order to allow the commission to adequately consider whether to allow the placement of an obstruction and whether any conditions may be attached:
   a. Site plan showing right-of-way, utilities, driveways as directed by staff;
   b. Sight distance per Chapter 10.32, Traffic Sight Obstructions;
   c. Traffic control plan including parking per Manual on Uniform Traffic Control Devices (MUTCD);
   d. Alternative routes if necessary;
   e. Minimizing obstruction area; and
   f . Hold harmless/maintenance agreement.
3. If the commission adopts a resolution allowing the placement of a permanent obstruction in the right-of-way, the city engineer shall issue a right-of-way permit with any conditions deemed necessary by the commission.

B. Temporary Obstructions.

1. A "temporary obstruction" is defined as an object placed in a public street, road or alley for a period of not more than sixty consecutive days. A "temporary obstruction" includes, but is not limited to, moving containers and debris dumpsters.
2. The city engineer, or designee, is authorized to grant a permit for a temporary obstruction.
3. The city engineer shall provide applicants with an application form outlining the minimum submittal requirements.
4. The applicant shall submit, and the city engineer, or designee, shall consider, at least the following items in the permitting process. Additional information may be required in the discretion of the city engineer:
   a. Site plan showing right-of-way, utilities, driveways as directed by staff;
   b. Sight distance per Chapter 10.32, Traffic Sight Obstructions;
   c. Traffic control plan including parking per Manual on Uniform Traffic Control Devices (MUTCD);
   d. Alternative routes if necessary;
   e. Minimizing obstruction area; and
   f. Hold harmless/maintenance agreement.

5. In determining whether to issue a right-of-way permit to allow a temporary obstruction, the city engineer may issue such a permit only after finding that the following criteria have been satisfied:
   a. The obstruction will not unreasonably impair the safety of people using the right-of-way and nearby residents;
   b. The obstruction will not unreasonably hinder the efficiency of traffic affected by the obstruction;
   c. No alternative locations are available that would not require use of the public right-of-way; and
   d. Any other factor that the city engineer deems relevant.
6. The permittee shall post a weatherproof copy of the temporary obstruction permit in plain view from the right-of-way.

C. Fees. The fee for obtaining a right-of-way permit for either a permanent obstruction or a temporary obstruction shall be set by resolution of the commission.

12.04.130 Obstructions--Sidewalk sales.

A. It is unlawful for any person to use the public sidewalks of the city for the purpose of packing, unpacking or storage of goods or merchandise or for the display of goods or merchandise for sale. It is permissible to use the public sidewalks for the process of expeditiously loading and unloading goods and merchandise.

B. The city commission may, in its discretion, designate certain areas of the city to permit the display and sale of goods or merchandise on the public sidewalks under such conditions as may be provided.

12.04.140 Obstructions--Nuisance--Penalty.

Any act or omission in violation of this chapter shall be deemed a nuisance. Violation of any provision of this chapter is subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24.

12.04.150 Street and alley vacations--Cost.

At the time of filing a petition for vacation of a street, alley or any part thereof, a fee as established by city commission resolution shall be paid to the city.

12.04.160 Street vacations--Restrictions.

The commission, upon hearing such petition, may grant the same in whole or in part, or may deny the same in whole or in part, or may grant the same with such reservations as would appear to be for the public interest, including reservations pertaining to the maintenance and use of underground public utilities in the portion vacated.

12.04.170 Street Design - Purpose and General Provisions.

All development shall be in conformance with the policies and design standards established by this chapter and with applicable standards in the City 's Public Facility Master Plan and City design standards and specifications. In reviewing applications for development, the City Engineer shall take into consideration any approved development and the remaining development potential of adjacent properties. All street, water, sanitary sewer, storm drainage and utility plans associated with any development must be reviewed and approved by the city engineer prior to construction. All streets, driveways or storm drainage connections to another jurisdiction's facility or right-of-way must be reviewed by the appropriate jurisdiction as a condition of the preliminary plat and when required by law or intergovernmental agreement shall be approved by the appropriate jurisdiction.

12.04.175 Street Design--Generally.

The location, width and grade of street shall be considered in relation to: existing and planned streets, topographical conditions, public convenience and safety for all modes of travel, existing and identified future

transit routes and pedestrian/bicycle accessways, and the proposed use of land to be served by the streets. The street system shall assure an adequate traffic circulation system with intersection angles, grades, tangents and curves appropriate for the traffic to be carried considering the terrain. To the extent possible, proposed streets shall connect to all existing or approved stub streets that abut the development site. Where location is not shown in the development plan, the arrangement of streets shall either:

A. Provide for the continuation or appropriate projection of existing principal streets in the surrounding area and on adjacent parcels or conform to a plan for the area approved or adopted by the city to meet a particular situation where topographical or other conditions make continuance or conformance to existing streets impractical;
B. Where necessary to give access to or permit a satisfactory future development of adjoining land, streets shall be extended to the boundary of the development and the resulting dead-end street (stub) may be approved with a temporary turnaround as approved by the city engineer. Access control in accordance with section 12.04.200 shall be required to preserve the objectives of street extensions.

12.04.180 Street Design--Minimum Right-of-Way.

All development shall provide adequate right-of-way and pavement width. Adequate right-of-way and pavement width shall be provided by:

A. Complying with the Street Design Standards contained in the table provided in chapter 12.04. The Street Design Standards are based on the classification of streets that occurred in the Oregon City Transportation System Plan (TSP), in particular, the following TSP figures provide the appropriate classification for each street in Oregon City: Figure 5-1: Functional Classification System and New Roadway Connections; Figure 5-3: Pedestrian System Plan; Figure 5.6: Bicycle System Plan; and Figure 5.7: Public Transit System Plan. These TSP figures from the Oregon City Transportation System Plan are incorporated herein by reference in order to determine the classification of particular streets.

Table 12.04.020 STREET DESIGN STANDARDS

Type of Street	**Maximum Right-of-Way Width**	**Pavement Width**
Major arterial	124 feet	98 feet
Minor arterial	114 feet	88 feet
Collector street	86 feet	62 feet
Neighborhood Collector street	81 feet	59 feet
Local street	54 feet	32 feet
Alley	20 feet	16 feet

B. The applicant may submit an alternative street design plan that varies from the Street Design Standards identified above. An alternative street design plan may be approved by the City Engineer if it is found the alternative allows for adequate and safe traffic, pedestrian and bicycle flows and transportation alternatives and protects and provides adequate multi-modal transportation services for the development as well as the surrounding community.

12.04.185 Street Design--Access Control.

A. A street which is dedicated to end at the boundary of the development or in the case of half-streets dedicated along a boundary shall have an access control granted to the City as a City controlled plat restriction for the purposes of controlling ingress and egress to the property adjacent to the end of the

dedicated street. The access control restriction shall exist until such time as a public street is created, by dedication and accepted, extending the street to the adjacent property.

B. The City may grant a permit for the adjoining owner to access through the access control.

C. The plat shall contain the following access control language or similar on the face of the map at the end of each street for which access control is required: "Access Control (See plat restrictions)."

D. Said plats shall also contain the following plat restriction note(s): "Access to (name of street or tract) from adjoining tracts (name of deed document number[s]) shall be controlled by the City of Oregon City by the recording of this plat, as shown. These access controls shall be automatically terminated upon the acceptance of a public road dedication or the recording of a plat extending the street to adjacent property that would access through those Access Controls."

12.04.190 Street Design--Alignment.

The centerline of streets shall be:

A. Aligned with existing streets by continuation of the centerlines; or

B. Offset from the centerline by no more than 10 feet, provided appropriate mitigation, in the judgment of the City Engineer, is provided to ensure that the offset intersection will not pose a safety hazard.

12.04.195 Minimum Street Intersection Spacing Standards.

A. All new development and redevelopment shall meet the following Public Street Intersection Spacing Standards:

Table 12.04.040 - Public Street Intersection Spacing Standards

	Distance in Feet between Streets of Various Classifications								
	Between Arterial and Arterial	Between Arterial and Collector	Between Arterial and Neighborhood Collector	Between Arterial and Local Street	Between Collector Street and Collector Street	Between Collector Street and Neighborhood Collector	Between Collector and Local Street	Between Neighborhood Collector and Local Street	Between two adjacent Local Streets
Measured along an Arterial Street	1320	800	600	300	600	300	150	150	150
Measured along a Collector Street	800	800	600	300	600	300	150	150	150
Measured along a Neighborhood Collector Street	800	600	300	300	300	150	150	150	150
Measured along a Local Street	600	600	300	300	300	150	150	150	150

Note: With regard to public intersection spacing standards, the same distances apply to both major arterial and minor arterial streets. In this table, the term "arterial" applies to both major arterial and minor arterial streets.

or

B. A lesser distance between intersections may be allowed, provided appropriate mitigation, in the judgment of the City Engineer, is provided to ensure that the reduction in intersection spacing will not pose a safety hazard.

12.04.200 Street Design--Constrained Local Streets and/or Rights-of-Way.

Any accessway with a pavement width of less than thirty-two feet shall require the approval of the City Engineer, Community Development Director and Fire Chief and shall meet minimum life safety requirements, which may include fire suppression devices as determined by the fire marshal to assure an adequate level of fire and life safety. The standard width for constrained streets is twenty feet of paving with no on-street parking and twenty-eight feet with on-street parking on one side only. Constrained local streets shall maintain a twenty-foot wide unobstructed accessway. Constrained local streets and/or right-of-way shall comply with necessary slope easements, sidewalk easements and altered curve radius, as approved by the City Engineer and Community Development Director.

Table 12.04.045
STREET DESIGN STANDARDS FOR LOCAL CONSTRAINED

STREETS		
	Minimum	Required
Type of Street	Right-of-Way	Pavement Width
Constrained local street	30 to 40 feet	20 to less than 32 feet

12.04.205 Intersection Level of Service Standards.

When reviewing new developments, the City of Oregon City requires all relevant intersections to be maintained at the minimum acceptable Level Of Service (LOS) upon full build-out of the proposed development. The minimum acceptable LOS standards are as follows:

A. For signalized intersection areas of the city that are located outside the Regional Center boundaries a LOS of "D" or better for the intersection as a whole *and* no approach operating at worse than LOS "E" *and* a v/c ratio not higher than 1.0 for the sum of critical movements.
B. For signalized intersections within the Regional Center boundaries a LOS "D" can be exceeded during the peak hour; however, during the second peak hour, LOS "D" or better will be required as a whole and no approach operating at worse than LOS "E" *and* a v/c ratio not higher than 1.0.
C. For unsignalized intersection throughout the city a LOS "E" or better for the poorest approach and with no movement serving more than 20 peak hour vehicles operating at worse than LOS "F" will be tolerated for minor movements during a peak hour.

12.04.210 Street design--Intersection Angles.

Except where topography requires a lesser angle, streets shall be laid out to intersect at angles as near as possible to right angles. In no case shall the acute angles be less than eighty degrees unless there is a special intersection design. An arterial or collector street intersecting with another street shall have at least one hundred feet of tangent adjacent to the intersection unless topography requires a lesser distance. Other streets, except alleys, shall have at least fifty feet of tangent adjacent to the intersection unless topography requires a lesser distance. All street intersections shall be provided with a minimum curb return radius of twenty-five feet for local streets. Larger radii shall be required for higher street classifications as determined by the city engineer. Additional right-of-way shall be required to accommodate curb returns and sidewalks at intersections. Ordinarily, intersections should not have more than two streets at any one point.

12.04.215 Street design--Off-Site Street Improvements.

During consideration of the preliminary plan for a development, the decision maker shall determine whether existing streets impacted by, adjacent to, or abutting the development meet the city's applicable planned minimum design or dimensional requirements. Where such streets fail to meet these requirements, the decision-maker shall require the applicant to make proportional improvements sufficient to achieve conformance with minimum applicable design standards required to serve the proposed development.

12.04.220 Street Design--Half Street.

Half streets, while generally not acceptable, may be approved where essential to the development, when in conformance with all other applicable requirements, and where it will not create a safety hazard. When approving half streets, the decision maker must first determine that it will be practical to require the dedication of the other half of the street when the adjoining property is divided or developed. Where the decision maker approves a half street, the applicant must construct an additional ten feet of pavement width so as to make the half street safe and usable until such time as the other half is constructed. Whenever a half street is adjacent to property capable of being divided or developed, the other half of the street shall be

provided and improved when that adjacent property divides or develops. Access Control as described in 12.04.200 may be required to preserve the objectives of half streets.

12.04.225 Street Design--Cul-de-sacs and Dead-End Streets.

The City discourages the use of cul-de-sacs and permanent dead-end streets except where construction of a through street is found by the decision maker to be impracticable due to topography or some significant physical constraint such as unstable soils, wetland, natural or historic resource areas, dedicated open space, existing development patterns, or arterial access restrictions. When permitted, cul-de-sacs and permanent dead-end streets shall have a maximum length of three hundred fifty feet, as measured from the right-of-way line of the nearest intersecting street to the back of the cul-de-sac curb face, and include pedestrian/bicycle accessways as provided in Section 17.90.220 of this code and Chapter 12.24. This section is not intended to preclude the use of curvilinear eyebrow widening of a street where needed to provide adequate lot coverage.

Where approved, cul-de-sacs shall have sufficient radius to provide adequate turn-around for emergency vehicles in accordance with Fire District and City adopted street standards. Permanent dead-end streets other than cul-de-sacs shall provide public street right-of-way / easements sufficient to provide turn-around space with appropriate no-parking signs or markings for waste disposal, sweepers, and other long vehicles in the form of a hammerhead or other design to be approved by the decision maker. Driveways shall be encouraged off the turnaround to provide for additional on-street parking space.

12.04.230 Street Design--Street Names.

Except for extensions of existing streets, no street name shall be used which will duplicate or be confused with the name of an existing street. Street names shall conform to the established standards in the City and shall be subject to the approval of the City.

12.04.235 Street Design--Grades and Curves.

Grades and center line radii shall conform to the standards in the City's street design standards and specifications.

12.04.240 Street Design--Development Abutting Arterial or Collector Street.

Where development abuts or contains an existing or proposed arterial or collector street, the decision maker may require: access control; screen planting or wall contained in an easement or otherwise protected by a restrictive covenant in a form acceptable to the decision maker along the rear or side property line; or such other treatment it deems necessary to adequately protect residential properties or afford separation of through and local traffic. Reverse frontage lots with suitable depth may also be considered an option for residential property that has arterial frontage. Where access for development abuts and connects for vehicular access to another jurisdiction's facility then authorization by that jurisdiction may be required.

12.04.245 Street Design--Pedestrian and Bicycle Safety.

Where deemed necessary to ensure public safety, reduce traffic hazards and promote the welfare of pedestrians, bicyclists and residents of the subject area, the decision maker may require that local streets be so designed as to discourage their use by nonlocal automobile traffic.

All crosswalks shall include a large vegetative or sidewalk area which extends into the street pavement as far as practicable to provide safer pedestrian crossing opportunities. These curb extensions can increase the visibility of pedestrians and provide a shorter crosswalk distance as well as encourage motorists to drive

slower. The decision maker may approve an alternative design that achieves the same standard for constrained sites or where deemed unnecessary by the City Engineer.

12.04.255 Street design--Alleys.

Public alleys shall be provided in the following districts R-5, R-3.5, R-2, MUC-1, MUC-2 and NC zones unless other permanent provisions for private access to off-street parking and loading facilities are approved by the decision maker. The corners of alley intersections shall have a radius of not less than ten feet.

12.04.260 Street Design--Transit.

Streets shall be designed and laid out in a manner that promotes pedestrian and bicycle circulation. The applicant shall coordinate with Tri-Met where the application impacts transit streets as identified on Figure 5.7: Public Transit System Plan of the Oregon City Transportation System Plan. Pedestrian/bicycle access ways shall be provided as necessary in conformance with the requirements in Section 17.90.220 of this code and Chapter 12.24 to minimize the travel distance to transit streets and stops and neighborhood activity centers. The decision maker may require provisions, including easements, for transit facilities along transit streets where a need for bus stops, bus pullouts or other transit facilities within or adjacent to the development has been identified.

12.04.265 Street design--Planter Strips.

All development shall include vegetative planter strips that are five feet in width or larger and located adjacent to the curb. This requirement may be waived or modified if the decision maker finds it is not practicable. The decision maker may permit constrained sites to place street trees on the abutting private property within 10 feet of the public right-of-way if a covenant is recorded on the title of the property identifying the tree as a city street tree which is maintained by the property owner. Development proposed along a collector, minor arterial, or major arterial street may use tree wells with root barriers located near the curb within a wider sidewalk in lieu of a planter strip, in which case each tree shall have a protected area to ensure proper root growth and reduce potential damage to sidewalks, curbs and gutters.

To promote and maintain the community tree canopy adjacent to public streets, trees shall be selected and planted in planter strips in accordance with Chapter 12.08, Street Trees. Individual abutting lot owners shall be legally responsible for maintaining healthy and attractive trees and vegetation in the planter strip. If a homeowners' association is created as part of the development, the association may assume the maintenance obligation through a legally binding mechanism, e.g., deed restrictions, maintenance agreement, etc., which shall be reviewed and approved by the city attorney. Failure to properly maintain trees and vegetation in a planter strip shall be a violation of this code and enforceable as a civil infraction.

12.04.270 Standard Construction Specifications.

The workmanship and materials for any work performed under permits issued per this chapter shall be in accordance with the edition of the "Standard Specifications for Public Works Construction," as prepared by the Oregon Chapter of American Public Works Association (APWA) and as modified and adopted by the city, in effect at the time of application. The exception to this requirement is where this chapter and the Public Works Street Design Drawings provide other design details, in which case the requirements of this chapter and the Public Works Street Design Drawings shall be complied with. In the case of work within ODOT or Clackamas County rights-of-way, work shall be in conformance with their respective construction standards.

12.04.280 Violation--Penalty.

Any act or omission in violation of this chapter shall be deemed a nuisance. Violation of any provision of this chapter is subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24.

13.04.030 Permits – Renewal – Change of Service

A. The City issues engineering permits for water line work in the right-of-way either as a separate Public Works permit or as part of overall issued public infrastructure construction plans. The various fees for these permits are approved and modified from time to time by the City Commission. Failure to meet the conditions of the issued permit shall constitute a violation of the Municipal Code.

B. When permits for renewal or change of service are granted, the old service will be shut-off and disconnected at the main by employees of the city. The charge for same shall be the reasonable costs as determined by administrative policy.

13.04.340 Standard Construction Specifications.

The workmanship and materials for any work performed under permits issued per this chapter shall be in accordance with the edition of the "Standard Specifications for Public Works Construction," as prepared by the Oregon Chapter of American Public Works Association (APWA) and as modified and adopted by the city, in effect at the time of application. The exception to this requirement is where this chapter and the Public Works Water Distribution System Design Standards provide other design details, in which case the requirements of this chapter and the Public Works Water Distribution System Design Standards shall be complied with.

13.08.050 Engineer - Permits

A. The City issues engineering permits for sewer line work in the right-of-way either as a separate Public Works permit or as part of overall issued public infrastructure construction plans. The various fees for these permits are approved and modified from time to time by the City Commission. Failure to meet the conditions of the issued permit shall constitute a violation of the Municipal Code.

B. The engineer is authorized to grant such permits as he may deem necessary for allowing persons to tap the public sewers, and to make connections therewith; provided however, that the permit shall be granted on the express condition that the owner or tenant for whose benefit such connection shall be made, and each succeeding tenant shall in consideration of the privilege thereby granted, hold the city harmless for any loss or damage that may in any way result from or be occasioned by any such tap or connection.

13.08.230 Standard Construction Specifications.

The workmanship and materials for any work performed under permits issued per this chapter shall be in accordance with the edition of the "Standard Specifications for Public Works Construction," as prepared by the Oregon Chapter of American Public Works Association (APWA) and as modified and adopted by the city, in effect at the time of application. The exception to this requirement is where this chapter and the Public Works Sanitary Sewer Design Standards provide other design details, in which case the requirements of this chapter and the Public Works Sanitary Sewer Design Standards shall be complied with.

13.12.010 Purpose

The purpose of this chapter is to define policies, minimum requirements, minimum standards and design procedures and permits for the construction and maintenance of stormwater conveyance and quantity and quality control facilities in order to:

A. Minimize increased stormwater runoff rates from any new development so as to minimize the impact upon any downstream natural channel that may exist between the subject area and the Willamette or Clackamas Rivers;
B. Prevent water runoff generated by development from exceeding the capacity of downstream stormwater facilities;
C. Reduce stormwater runoff rates and volumes, soil erosion and nonpoint source pollution, wherever possible, from lands that were developed without the stormwater management controls required by this chapter;
D. Prevent the uncontrolled or irresponsible discharge of stormwater from new development onto adjoining public or private property;
E. Maintain the integrity of stream channels for their biological functions, as well as for drainage and other purposes;
F. Have stormwater conveyance facilities of adequate design to manage all volumes of water generated in the contributing drainage area, for both the existing condition and the anticipated future condition;
G. Have all stormwater facilities:
    1. Designed in a manner to allow economical future maintenance,
    2. If city owned or maintained, designed for maintenance with city owned equipment,
    3. Designed using materials that will ensure a minimum practical design life of seventy-five years, and
    4. Designed to have sufficient structural strength to resist erosion and all external loads (construction, traffic, seismic) which may be imposed;
H. Establish maintenance easements with the owners of privately owned/maintained stormwater facilities to ensure an appropriate level of maintenance and to help minimize public safety hazards;
I. Have all new stormwater facilities comply with applicable National Pollutant Discharge Elimination System (NPDES) requirements;
J. Minimize the deterioration of existing watercourses, culverts, bridges, dams and other structures;
K. Minimize increases in nonpoint source pollution; and
L. Allow for periodic inspections of both private and public stormwater quantity control and quality control facilities to verify that they are functioning in substantial conformance with the approved design intent.
M. Allow Issuance of engineering permits for stormwater work in the right-of-way or public easements either as a separate Public Works permit or as part of overall issued public infrastructure construction plans. The various fees for these permits are approved and modified from time to time by the City Commission. Failure to meet the conditions of the issued permit shall constitute a violation of the Municipal Code.

13.12.180 Violation--Penalty.

Any act or omission in violation of this chapter shall be deemed a nuisance. Violation of any provision of this chapter is subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24.

Oregon City Municipal Code
Chapter 16.08 Subdivisions – Process and Standards

16.08.010 Purpose and General Provisions.

A. Applicability. This chapter controls the process and approval standards applicable to subdivisions including Chapters 16.08, 12.04, 16.12, and 17.50 of the Oregon City Municipal Code as well as any other applicable chapters. A subdivision is defined as a single division of land into four or more lots within a calendar year.
B. These applications shall generally follow a Type II process. However, if an applicant opts to process either application as an expedited land division, the city shall follow the decision-making process provided by state law and apply the applicable approval standards set forth in this code and elsewhere.
C. Purpose. The purpose of this chapter is to provide a speedy review and decision-making process with relatively clear and objective criteria indicating little discretion, with little opportunity to deviate from the City's dimensional standards. If an applicant wishes greater flexibility in lotting pattern or layout, phasing of development, or relief from dimensional or public improvement standards, the appropriate procedure would be a master plan under Chapter 17.65 or an additional application for a variance(s) under Chapter 17.60.
D. Process Overview. Subdivision review process requires a two-step process: preliminary and final plats. The preliminary plat, reviewed through a Type II process, provides all of the essential information about the proposal, including layout, number and pattern of lots, location of all existing structures and improvements, significant natural features, development schedule and any other required information. The final plat is a formal reproduction of the approved preliminary plat, including all conditions imposed by the decision-maker, submitted in recordable form. So long as the final plat does not deviate from the product approved in the preliminary plat, the City's review of the final plat shall be conducted through a Type I process. If the final plat deviates significantly from the approved preliminary plat, the final plat review shall be processed in the same manner as was the preliminary plat.

16.08.015 Preapplication Conference Required.

Before the City will accept a subdivision application, the applicant must schedule and attend a preapplication conference in accordance with Section 17.50.050. At a minimum, an applicant should bring to the preapplication conference a tax map of the subject tax lot(s) and surrounding tax lots, scale drawings of the proposed subdivision lotting pattern, streets, utilities and important site features and improvements, and a topographic map of the property.

16.08.020 Preliminary Subdivision Plat Application.

Within six (6) months of the preapplication conference, an applicant may apply for preliminary subdivision plat approval. The applicant's submittal must provide a complete description of existing conditions, the proposed subdivision and an explanation of how the application meets all applicable approval standards. The following sections describe the specific submittal requirements for a preliminary subdivision plat, which include plan drawings, a narrative statement and certain tabular information. Once the application is deemed to be complete, the Community Development Director shall provide notice of the application and an invitation to comment for a minimum of fourteen days to surrounding property owners in accordance with 17.50.090(A). At the conclusion of the comment period, the Community Development Director will evaluate the application, taking into consideration all relevant, timely filed comments, and render a written decision in accordance with Section 17.50. The Community Development Director's decision may be appealed to the City Commission with notification to the Planning Commission.

16.08.025 Preliminary Subdivision Plat--Required Plans.

The preliminary subdivision plat shall specifically and clearly show the following features and information on the maps, drawings, application form or attachments. All maps and site drawings shall be at a minimum scale of one inch to fifty feet.

A. Site Plan. A detailed site development plan showing the location and dimensions of lots, streets, pedestrian ways, transit stops, common areas, building envelopes and setbacks, all existing and proposed utilities and improvements including sanitary sewer, stormwater and water facilities, total impervious surface created (including streets, sidewalks, etc.) and an indication of existing and proposed land uses for the site. If required by staff at the pre-application conference, a subdivision connectivity analysis shall be prepared by a transportation engineer licensed by the State of Oregon that describes the existing and future vehicular, bicycle and pedestrian connections between the proposed subdivision and existing or planned land uses on adjacent properties. The subdivision connectivity analysis shall include shadow plats of adjacent properties demonstrating how lot and street patterns within the proposed subdivision will extend to and/or from such adjacent properties and can be developed meeting the existing Oregon City Municipal Code design standards.

B. Traffic/Transportation Plan. The applicant's traffic/transportation information shall include two elements: (1) A detailed site circulation plan showing proposed vehicular, bicycle, transit and pedestrian access points and connections to the existing system, circulation patterns and connectivity to existing rights-of-way or adjacent tracts, parking and loading areas and any other transportation facilities in relation to the features illustrated on the site plan; and (2) a traffic impact study prepared by a qualified professional transportation engineer, licensed in the state of Oregon, that assesses the traffic impacts of the proposed development on the existing transportation system and analyzes the adequacy of the proposed internal transportation network to handle the anticipated traffic and the adequacy of the existing system to accommodate the traffic from the proposed development. The City Engineer may waive any of the foregoing requirements if determined that the requirement is unnecessary in the particular case.

C. Natural Features Plan and Topography, Preliminary Grading and Drainage Plan. The applicant shall submit a map illustrating all of the natural features and hazards on the subject property and, where practicable, within two hundred fifty feet of the property's boundary. The map shall also illustrate the approximate grade of the site before and after development. Illustrated features must include all proposed streets and cul-de-sacs, the location and estimated volume of all cuts and fills, and all stormwater management features. This plan shall identify the location of drainage patterns and courses on the site and within two hundred fifty feet of the property boundaries where practicable. Features that must be illustrated shall include the following:

1. Proposed and existing street rights-of-way and all other transportation facilities;
2. All proposed lots and tracts;
3. All trees proposed to be removed prior to final plat with a diameter six inches or greater diameter at breast height (d.b.h);
4. All natural resource areas pursuant to Chapter 17.49, including all jurisdictional wetlands shown in a delineation according to the Corps of Engineers Wetlands Delineation Manual, January, 1987 edition, and approved by the Division of State Lands and wetlands identified in the City of Oregon Local Wetlands inventory, adopted by reference in the City of Oregon City comprehensive plan;
5. All known geologic and flood hazards, landslides or faults, areas with a water table within one foot of the surface and all flood management areas pursuant to Chapter 17.42;
6. The location of any known state or federal threatened or endangered species;
7. All historic areas or cultural features acknowledged as such on any federal, state or city inventory;
8. All wildlife habitat or other natural features listed on any of the City's official inventories.

D. Archeological Monitoring Recommendation. For all projects that will involve ground disturbance, the applicant shall provide,

1. A letter or email from the Oregon State Historic Preservation Office Archaeological Division indicating the level of recommended archeological monitoring on-site, or demonstrate that the applicant had notified the Oregon State Historic Preservation Office and that the Oregon State Historic Preservation Office had not commented within 45 days of notification by the applicant; and
2. A letter or email from the applicable tribal cultural resource representative of the Confederated Tribes of the Grand Ronde, Confederated Tribes of the Siletz, Confederated Tribes of the Umatilla, Confederated Tribes of the Warm Springs and the Confederated Tribes of the Yakama Nation indicating the level of recommended archeological monitoring on-site, or demonstrate that the applicant had notified the applicable tribal cultural resource representative and that the applicable tribal cultural resource representative had not commented within 45 days of notification by the applicant.

If, after 45 days notice from the applicant, the Oregon State Historic Preservation Office or the applicable tribal cultural resource representative fails to provide comment, the city will not require the letter or email as part of the completeness review. For the purpose of this section, ground disturbance is defined as the movement of native soils.

The Community Development Director may waive any of the foregoing requirements if the Community Development Director determines that the requirement is unnecessary in the particular case and that the intent of this chapter has been met.

16.08.030 Preliminary Subdivision Plat--Narrative Statement.

In addition to the plans required in the previous section, the applicant shall also prepare and submit a narrative statement that addresses the following issues:

A. Subdivision Description. A detailed description of the proposed development, including a description of proposed uses, number and type of residential units, allocation and ownership of all lots, tracts, streets, and public improvements, the structure of any homeowner's association, and each instance where the proposed subdivision will vary from some dimensional or other requirement of the underlying zoning district. For each such variance, a separate application will be required pursuant to Chapter 17.60, Variances;

B. Timely Provision of Public Services and Facilities. The applicant shall explain in detail how and When each of the following public services or facilities is, or will be, adequate to serve the proposed development by the time construction begins:
   1. Water,
   2. Sanitary sewer,
   3. Storm sewer and stormwater drainage,
   4. Parks and recreation,
   5. Traffic and transportation,
   6. Schools,
   7. Fire and police services;

   Where adequate capacity for any of these public facilities and services is not demonstrated to be currently available, the applicant shall describe how adequate capacity in these services and facilities will be financed and constructed before recording of the plat;

C. Approval Criteria and Justification for Variances. The applicant shall explain how the proposed subdivision is consistent with the standards set forth in Chapter 16.12, 12.04 and any other applicable approval standards identified in the municipal code. For each instance where the applicant proposes a variance from some applicable dimensional or other numeric requirement, the applicant shall address the approval criteria from Chapter 17.60 .

D. Drafts of the proposed covenants, conditions and restrictions (CC&Rs), maintenance agreements, homeowner association agreements, dedications, deeds easements, or reservations of public open spaces not dedicated to the city, and related documents for the subdivision;
E. A description of any proposed phasing, including for each phase the time, acreage, number of residential units, amount of area for nonresidential use, open space, development of utilities and public facilities;
F. Overall density of the subdivision and the density by dwelling type for each.

16.08.035 Notice and Invitation to Comment.

Upon the City's determination that an application for a preliminary subdivision plat is complete, pursuant to Section 17.50, the city shall provide notice of the application in accordance with requirements of Section 17.50 applicable to Type II decisions.

16.08.040 Preliminary Subdivision Plat--Approval Standards and Decision.

The minimum approval standards that must be met by all preliminary subdivision plats are set forth in Chapter 16.12, and in the dimensional and use requirements set forth in the chapter of this code that corresponds to the underlying zone. The Community Development Director shall evaluate the application to determine that the proposal does, or can through the imposition of conditions of approval, meet these approval standards. The Community Development Director's decision shall be issued in accordance with the requirements of Section 17.50.

16.08.045 Building Site--Frontage Width Requirement.

Each lot in a subdivision shall abut upon a cul-de-sac or street other than an alley for a width of at least twenty feet.

16.08.050 Flag Lots in Subdivisions

Flag lots shall not be permitted within subdivisions except as approved by the Community Development Director and in compliance with the following standards.
A. Where the applicant can show that the existing parcel configuration, topographic constraints or where an existing dwelling unit is located so that it precludes a land division that meets the minimum density, lot width and/or depth standards of the underlying zone.
B. If a flag lot is created, a joint accessway shall be provided unless the location of the existing dwelling unit prevents a joint accessway. A perpetual reciprocal access easement and maintenance agreement shall be recorded for the joint accessway, in a format acceptable by the city attorney.
C. The pole portion of the flag lot shall connect to a public street.
D. The pole shall be at least 8 feet wide for the entire length.
E. The pole shall be part of the flag lot and must be under the same ownership as the flag portion of the lot.

16.08.055 Final Subdivision Plat--Application Requirements and Approval Standards.

The applicant shall apply for final subdivision plat approval within twenty-four months following approval of a preliminary subdivision plat. The applicant shall apply for final plat approval to the City and shall pay the applicable fees as set forth on the City's adopted fee schedule. The final subdivision plat is processed as an administrative decision by the City so long as the final subdivision plat is consistent with the approved preliminary subdivision plat as conditioned by the decision-maker.
A. If the Community Development Director determines that the final subdivision plat submitted by the applicant is not consistent with the approved preliminary subdivision plat, the modified subdivision shall be subject to the same Type II process and review standards as were applicable to the preliminary subdivision plat. However, if such a review is necessary, the review shall be limited only

to those aspects of the final subdivision plat that deviate from the approved preliminary subdivision plat. The decision-maker's original approval of all other aspects of the subdivision may be relied upon as a conclusive determination of compliance with the applicable standards.

B. The Community Development Director shall approve a final subdivision plat that is consistent with the approved preliminary subdivision plat, including any conditions attached thereto and required permits for access to facilities owned by another jurisdiction.

16.08.060 Filing and Recording of Final Subdivision Plat.

Following approval of the final subdivision plat, the applicant shall file with the county recording officer the confirmed and approved copy of the final subdivision plat together with all pertinent documents approved as to form by the city attorney.

16.08.065 Post-Approval Modifications to Approved Plat.

All modifications to a subdivision that has received final plat approval shall be applied for and processed in the same manner as was the original preliminary subdivision plat and subject to the same approval standards. However, the city is entitled to rely upon the prior decision and findings for those portions of the subdivision that the applicant does not propose to modify.

Oregon City Municipal Code
Chapter 16.16 Minor Partitions—Process and Standards

16.16.010 Purpose and General Provisions.

A. Minor Partitions shall be processed as a Type II decision by the Community Development Director in the same manner as set forth in Section 16.04.020.A and the applicable provisions in Chapters 16.16 12.04, 16.12 and 17.50 of the Oregon City Municipal Code as well as any other applicable chapter. A minor partition is defined as a single division of land into two or three lots. Approval shall be granted only upon determination that all applicable requirements of this title and ORS Chapter 92 have been met.
B. If a parcel of land to be partitioned will create lots large enough to be divided again, the applicant shall provide a hypothetical non-binding plan or "shadow plat" depicting possible future development of the resulting lots.
C. Lot Size Limitations for Partitions in Residential Zoning Designations. A residentially zoned parcel of land or the aggregate of contiguous parcels under the same ownership containing sufficient net buildable area to be subdivided by the minimum lot size requirements of the underlying zone into 4 or more lots shall be subject to the Subdivision procedures and standards specified in Sections 16.08 and 16.12. The calculation of the net buildable area for the parcel or lot to be divided shall be determined by the Community Development Director. This standard shall not apply to a multi-family zoning designation.
D. A parcel of land in existence at the time this ordinance was adopted may be partitioned once if solely for the purpose of segregating one separate smaller parcel for an existing or proposed single-family house. The original parcel shall be exempt from the Lot Size Limitation for Partitions found in (C) above. The parcel to be created for the single-family house shall not contain sufficient lot area to allow further partitioning under the standards of the applicable existing zone including the use of administrative variances.

16.16.015 Preapplication Conference Required.

Before the city will accept an application for a partition, the applicant must attend a preapplication conference under Section 17.50.

16.16.020 Minor Partition Application Submission Requirements.

A minor partition application shall include twelve copies of the proposed partition to the Community Development Director on a reproducible material, drawn at a minimum scale of one-inch equals one hundred feet with the following information:

A. A completed land use application form as provided by the planning division;
B. Legal descriptions of the parent parcel(s) and a preliminary plat map;
C. The name and address of the owner(s) and the representative, if any;
D. County tax assessment map number(s) of the land to be partitioned;
E. The map scale and north point;
F. Approximate courses and dimensions of all parts of the partition;
G. Around the periphery of the proposed minor partition, the boundary lines and names of adjacent minor partitions and subdivisions, streets and tract lines of adjacent parcels of property;
H. The location, width and names of all existing or platted streets, other public ways and easements within the proposed partition, and other important features, such as the general outline and location of permanent buildings, pedestrian/bicycle access ways, watercourses, power lines, telephone lines, railroad lines, gas lines, water lines, municipal boundaries and section lines;
I All areas designated as being within an overlay district
J. A connectivity analysis may be required as directed at the pre-application conference. If required, the partition connectivity analysis shall be prepared by an engineer licensed by the State of Oregon which describes the existing and future vehicular, bicycle and pedestrian connections between the proposed partition and existing or planned land uses on adjacent properties. The connectivity analysis shall include shadow plats of adjacent properties demonstrating how lot and street patterns within the

proposed partition will extend to and/or from such adjacent properties and can be developed meeting the existing Oregon City Municipal Code design standards.

K. Archeological Monitoring Recommendation. For all projects that will involve ground disturbance, the applicant shall provide,

1. A letter or email from the Oregon State Historic Preservation Office Archaeological Division indicating the level of recommended archeological monitoring on-site, or demonstrate that the applicant had notified the Oregon State Historic Preservation Office and that the Oregon State Historic Preservation Office had not commented within 45 days of notification by the applicant; and
2. A letter or email from the applicable tribal cultural resource representative as designated by the Oregon Legislative Commission on Indian Services (CIS) and the Yakama Nation indicating the level of recommended archeological monitoring on-site,or demonstrate that the applicant had notified the applicable tribal cultural resource representative and that the applicable tribal cultural resource representative had not commented within 45 days of notification by the applicant.

If, after 45 days notice from the applicant, the Oregon State Historic Preservation Office or the applicable tribal cultural resource representative fails to provide comment, the city will not require the letter or email as part of the completeness review. For the purpose of this section, ground disturbance is defined as the movement of native soils.

16.16.025 Frontage Width Requirement.

For parcels of land created by a minor partition the parcels shall have a minimum of twenty feet of frontage on an existing public, county, state or federal road or street (unless as otherwise permitted in OCMC Chapter 16.16).

16.16.030 Flag Lots – R-10, R-8, R-6, and R-3.5.

A. Flag lots may be permitted in Partitions only where the configuration, topography, or an existing dwelling unit is located on the property so that it would otherwise preclude the partitioning and development of the property.
B. A joint accessway shall be provided unless the existing topography of the site or the dwelling unit is located on the property to prevent a joint accessway. A perpetual reciprocal access easement and maintenance agreement shall be recorded for the joint accessway, in a format acceptable to the city attorney.
C. Access ways shall have a pavement width of at least sixteen feet to service one to two units or twenty feet to service three or more units. A fire access corridor of at least twenty feet shall be provided to all parcels with a minimum pavement width of sixteen feet to service two units or twenty feet to service three or more units. At least 6 inches of shoulder on each side of the fire access corridor shall be provided in order that construction work does not infringe on adjacent properties. A narrower pavement width may be approved by the Fire District and Planning Division. The approval may require that additional fire suppression devices be provided to assure an adequate level of fire and life safety. No vehicular obstruction, including trees, fences, landscaping or structures, shall be located within the fire access corridor.
D. The pole must connect to a public street.
E. The pole must be at least 8 feet wide for its entire length.
F. The pole must be part of the flag lot and must be under the same ownership as the flag portion of the lot.

16.16.035 Pavement Requirements.

Accessways for lots created through the minor partitioning process shall satisfy the requirements of Section 16.16.040 and 16.16.050. If the proposed accessway exceeds one hundred fifty feet in length the accessway shall conform to Fire District standards and shall be paved to a minimum width of twenty feet unless an alternative is approved by the Planning Division and Fire District. If more than two residences are served, a

turnaround for emergency vehicles shall be provided. The turnaround shall be approved by the City Engineer and Fire District. Improvements shall comply with Chapter 16.12, Minimum Improvements and Design Standards for Land Divisions.

16.16.040 Final Recordable Partition Plat.

If the partition application is approved, the applicant shall prepare a final partition plat that meets all applicable requirements and conditions of the planning manager decision, and the applicable requirements of ORS Chapter 92. The applicant shall then submit the final plat for signature by the appropriate city official prior to recording with the county.

16.16.045 Final Minor Partition Plat Requirements.

The City shall review the final partition plat for conformance with any conditions, required permits for access to facilities owned by another jurisdiction, and the applicable requirements of ORS Chapter 92. The final partition plat shall contain, or be accompanied by, the following information:

A. The city planning file number, located just below the title block;
B. The lines and names of all streets or other public and private ways, pedestrian/bicycle accessways, parks, playgrounds and easements intended to be dedicated for public use, or granted for use of the owners within the petition;
C. The length and bearings of all straight lines, curves, radii and arcs of all curves.
D. Street center line control based on recorded city control surveys for street center lines, if applicable;
E. The names or official reference numbers of all recorded subdivision or partition plats immediately adjacent to the land division;
F. Building envelopes indicating compliance with setbacks. This shall be shown on a separate copy of the final plat;
G. All homeowners' agreements, maintenance agreements, articles of incorporation, bylaws and CC&Rs. These matters shall be reviewed and verified by the city attorney for conformance with state and local requirements before recording with the final plat;
H. A declaration shall appear on the face of the final plat that conforms with the City's final plat review checklist as published by the City Engineer.

17.04 Definitions

17.04.515 - Geologic Hazards Overlay Zone.

"Geologic Hazards Overlay Zone" means the zone mapped by the City of Oregon City that is subject to review pursuant to Oregon City Municipal Code Chapter 17.44 as follows:

1. The following areas identified on the city's slope and geology map which represents:

a) Areas within fifty feet of the crest or toe of a slope that is twenty-five percent or greater, or within 200 feet of the crest or toe of a landslide geologic units Qls and Qf identified by DOGAMI and derived from LIDAR IMS-29 and IMS-26 publications in 2009, whichever is greater;

b) Areas with a slope of twenty-five percent or more;

c) Geologic Hazards areas identified by the State of Oregon Department of Geology and Mineral Industries (DOGAMI) as landslide or debris flow fan (Qls and Qf geologic units derived from LIDAR IMS-29 and IMS-26 publications in 2009);

d) Geologic Hazards areas identified in Bulletin 99, Geology and Geologic Hazards of Northwestern Clackamas County, Oregon (1979); and;

2. Any other area that is identified by a suitably qualified geotechnical engineer or engineering geologist who is licensed in Oregon and derives his or her livelihood principally from that profession as being subject to soil instability, slumping or earth flow, high groundwater level, and landslide.

17.04 Definitions

17.04.178

"carpool" means a group of two or more commuters, including the driver, who share the ride to or from work, school or other destination.

17.04.1458

"Vanpool" means a group of five or more commuters, including the driver, who share the ride to and from work, school or other destination on a regularly scheduled basis.

17.04. 743

Membrane or Fabric Covered Storage Area - An area covered by a tarp or tensioned metal or fabric membrane that is either attached to a rigid framework, natural feature or some other structure that is used for storage. It is not intended to include the weather proofing of a vehicle, boat or other individual item by a tarp or other type of covering as long the covering is attached directly to and covers only the particular item.

17.04.245 - Highly constrained residential lot.

A residential vacant lot of record that has less than thousand square feet of buildable area, with minimum dimensions of fifty feet by fifty feet, remaining outside the Natural Resource Overlay District.

17.04 Definitions

17.04.1360 - Tree, hazardous or diseased.

"Hazardous or diseased tree" means a tree that has a naturally occurring disease that is expected to kill the tree or that presents a significant risk to life or property as determined by a certified arborist. To the extent that the Community Development Director determines that the hazardous or diseased condition of the tree is the result of intentional action, the removal of that tree shall require mitigation pursuant to Section 17.41.060. An otherwise healthy tree that may become a hazard to a proposed future development shall not be considered a hazardous tree. Hazardous trees may include, but are not limited to dead, diseased, broken, split, cracked, leaning, and uprooted trees. A tree harboring communicable diseases or insects of a type that could infest and cause the decline of adjacent or nearby trees may also be identified as a hazardous tree.

Oregon City Municipal Code
Chapter 17.20 Residential Design and Landscaping Standards

17.20.010 Purpose.

The Residential Design Standards are intended to:

A. Enhance Oregon City through the creation of attractively designed housing and streetscapes.
B. Ensure that there is a physical and visual connection between the living area of the residence and the street.
C. Improve public safety by providing "eyes on the street".
D. Promote community interaction by designing the public way, front yards and open spaces so that they are attractive and inviting for neighbors to interact.
E. Prevent garages from obscuring or dominating the primary facade of the house.
F. Provide guidelines for good design at reasonable costs and with multiple options to achieve the purposes of this chapter.
G. The Community Development Director may approve an alternative design that achieves the intent of this chapter.

17.20.015 Street Trees.

All new single or two-family dwellings or additions of 25 percent or more of the existing square footage of the home (including the living space and garage(s)) shall install a street tree along the frontage of the site, within the abutting developed right-of-way. Existing trees may be used to meet this requirement. A picture of the planted tree shall be submitted to the Planning Division prior to issuance of occupancy. Upon approval by the Community Development Director, when a planter strip is not present, a tree may be placed within an easement on the abutting private property within 10 feet of the public right-of-way if a covenant is recorded for the property with the Clackamas County Recorders Office identifying the tree as a city street tree, subject to the standards in Chapter 12.08 of the Oregon City Municipal Code. The street tree shall be a minimum of 2-inchs in caliper and either selected from the Oregon City Street Tree List or approved by a certified arborist for the planting location.

17.20.020 Applicability.

The standards in section 17.20.030 through 17.20.050 apply to the street-facing facades of all single and two-family dwellings. New dwellings, new garages or expansions of an existing garage require compliance with one of the residential design options in chapter 17.20.030 or Chapter 17.21.

For the purpose of this chapter, garages are defined as structures, or portions thereof used or designed to be used for the parking of vehicles, including carports. The garage width shall be measured based on the foremost interior garage walls or carport cover. The Community Development Director may approve an alternative measurement location if the exterior façade screens a section of the garage or better accomplishes the goals of this Chapter.

17.20.030 Residential Design Options.

A. A dwelling with no garage or a detached garage shall comply with 5 of the residential design elements in 17.20.040.A on the front façade of the structure.

B. A dwelling without a garage on the primary street-facing façade may be permitted if shall include 5 of the residential design elements in 17.20.040.A on the front façade of the structure.

C. A dwelling with a front garage where the building is less than 24 feet wide may be permitted if:
1. The garage is no more than 12 feet wide and;

2. The garage does not extend closer to the street than the furthest forward living space on the street-facing façade; and
3. 6 of the residential design elements in 17.20.040.A are included on the front façade of the structure; and
4. 1 of the following is provided:
   a. Interior living area above the garage is provided. The living area must be set back no more than 4 feet from the street-facing garage wall; or
   b. A covered balcony above the garage is provided. The covered balcony must be at least the same length as the street-facing garage wall, at least 6 feet deep and accessible from the interior living area of the dwelling unit; or
   c. The garage is rear loaded.

D. A dwelling with a garage that extends up to 50% of the length of the street-facing façade and is not closer to the street than the furthest forward living space on the street-facing façade may be permitted if:
6 of the residential design elements in 17.20.040.A are included on the front façade of the structure.

E. A dwelling with a garage that extends up to 60% of the length of the street-facing-façade and is recessed 2 feet or more from the furthest forward living space on the street-facing façade may be permitted if:
1. 7 of the residential design elements in 17.20.040.A are included on the front façade of the structure.

F. A dwelling with a garage that extends up to 60% of the length of the street-facing façade may extend up to 4 feet in front of the furthest forward living space on the street-facing façade may be permitted if:
1. 8 of the residential design elements in 17.20.040.A are included on the front façade of the structure; and
2. 1 of the options in 17.20.040.B is provided on the front façade of the structure.

G. A dwelling with a garage that extends up to 50% of the length of the street-facing façade may extend up to 8 feet in front of the furthest forward living space on the street-facing façade if:
1. 9 of the residential design elements in 17.20.040.A are included on the front of the structure; and
2. 1 of the options in 17.20.040.B is provided on the front façade of the structure.

H. A dwelling with a garage that is side-orientated to the front lot line and may extend up to 32 feet in front of the furthest forward living space on the street-facing facade if:
1. Windows occupy a minimum of 15% of the lineal length of the street-facing wall; and
2. 6 of the residential design elements in 17.20.040.A are included on the front façade of the structure.

17.20.035 Corner Lots and Through Lots

A. Homes on corner lots and through lots shall comply with one of the options in 17.20.030 for the front of the home.
B. The other street-facing side of the home shall include the following:
1. windows and doors for a minimum of 15% of the lineal length of the ground floor façade; and
2. minimum 4-inch window trim; and
3. 3 additional residential design elements selected from 17.20.040.A.

17.20.040 Residential Design Elements.

A. The residential design elements listed below shall be provided as required in section 17.20.030 above. Alternatives to the standards in Chapter 17.20.040 may be approved through a Type II Land Use decision that is in compliance with the purpose of this Chapter listed in 17.20.010.
1. The design of the dwelling includes dormers, which are projecting structures built out from a sloping roof housing a vertical window;
2. The roof design utilizes a:

a. Gable, which is a roof sloping downward in two parts from a central ridge, so as to form a gable at each end; or
b. Hip, which is a roof having sloping ends and sides meeting at an inclined projecting angle.

3. The building facade includes 2 or more offsets of 16-inches or greater;
4. A roof overhang of 16-inches or greater;
5. A recessed entry that is at least 2 feet behind the furthest forward living space on the ground floor, and a minimum of 8 feet wide;
6. A minimum 60 square-foot covered front porch that is at least 5 feet deep or a minimum 40 square-foot covered porch with railings that is at least 5 feet deep and elevated entirely a minimum of 18-inches;
7. A bay window that extends a minimum of 12-inches outward from the main wall of a building and forming a bay or alcove in a room within;
8. Windows and main entrance doors that occupy a minimum of 15% of the lineal length of the front façade (not including the roof and excluding any windows in a garage door);
9. Window trim (minimum 4-inches);
10. Window grids (excluding any windows in the garage door or front door).
11. Windows on all elevations include a minimum of 4-inch trim (worth 2 elements);
12. Windows on all of the elevations are wood, cladded wood, or fiberglass (worth 2 elements);
13. Windows on all of the elevations are recessed a minimum of two inches from the façade (worth 2 elements);

11. A balcony that projects from the wall of the building and is enclosed by a railing or parapet;

14. Shakes, shingles, brick, stone or other similar decorative materials shall occupy a minimum of 60 square feet of the street façade;
15. All garage doors are a maximum 9-feet wide;
16. All garage doors wider than 9-feet are designed to resemble 2 smaller garage doors;
17. There are a minimum of two windows in each garage door;

15. A third garage door is recessed a minimum of 2 feet;

16. A window over the garage door that is a minimum of 12 square feet with window trim (minimum 4-inches);

17. There is no attached garage onsite;
18. The living space of the dwelling is within 5 feet of the front yard setback; or
19. The driveway is composed entirely of pervious pavers or porous pavement.

B. If the garage projects in front of the furthest forward living space on the street facing façade, one of the residential design elements (1) or (2) below, shall be provided in addition to the residential design elements required in Section 17.20.040.A above. Residential design elements utilized in Section 17.20.040.B can be additionally utilized in Section 17.20.040.A.
   1. A minimum 60 square-foot covered front porch that is at least 5 feet deep; or a minimum 40 square-foot covered porch with railings that is at least 5 feet deep and elevated entirely a minimum of 18-inches.
   2. The garage is part of a 2-level façade. The 2nd level façade shall have a window (minimum 12 square feet) with window trim (minimum 4-inches).

17.20.050 Main Entrances.

The main entrance for each structure shall:

A. Face the street; or
B. Be at an angle up to 45 degrees from the street;
C. Open onto a covered porch that is at least 60 square feet with a minimum depth of 5 feet on the front or, in the case of a corner lot, the side of the home.

17.20.060 Residential Yard Landscaping

The intent of this section is to ensure that residential lots are landscaped and to encourage the retention of trees, minimize the impact of tree loss during development and ensure a sustainable tree canopy in Oregon City. Though not required, the use of native species and low water use vegetation is recommended, but in no case may materials identified on the Oregon City Nuisance Plant list be used.

A. Tree requirement. This requirement may be met using one or any combination of the three options below (Tree Preservation, Tree Planting, or Tree Fund). Table 17.20.060(A) identifies the minimum number of inches of tree diameter per lot that shall be preserved, planted or paid into the Tree Fund. Adjustments from this section are prohibited. The applicant shall submit a residential yard landscaping plan for Options (1) and (2) demonstrating compliance with the requirements of this section.

TABLE 17.20.060(A) - Tree Requirements

Lot Size (square feet)	Tree Diameter Inches Required to be Protected, Planted or Paid into Tree Fund
0 – 4,999	4"
5,000 – 7,999	6"
8,000 – 9,999	8"
10,000 – 14,999	10"
15,000 +	12"

1. Tree preservation. The size of existing trees to be preserved shall be measured as Diameter at Breast Height (DBH).
    a. This standard shall be met using trees that are located on the lot and trees that are located within public and private right-of-way shall not be used to meet this standard. When this option is used, a tree preservation plan is required.
    b. Trees to be preserved may be located anywhere on the lot, and shall be a minimum of 2" caliper DBH.
    c. Large Native or Heritage Tree Incentive. If a tree is preserved that is selected from the list in Table 17.20.060(A)(2)(c), the diameter of the tree may be doubled when demonstrating compliance with the minimum tree requirements indicated in Table 17.20.060(A) above. For example, an Oregon White Oak with a 2" caliper at DBH may count as a tree diameter of 4".

2. Tree planting. All planted trees shall measure a minimum 2" caliper at 6" above the root crown. When this option is used, a tree planting plan is required.
    a. Trees planted pursuant to this section on R-6, R-8 and R-10 zoned lots shall include at least one tree in the front yard setback, unless it is demonstrated that it is not feasible due to site constraints.
    b. Trees planted pursuant to this section on R-5 and R-3.5 zoned lots may be planted anywhere on the lot as space permits.
    c. Large Native or Heritage Tree Incentive. If a tree is planted that is selected from the list in Table 17.20.060(A)(2)(c), the diameter of the tree may be doubled when demonstrating compliance with the minimum tree requirements indicated in Table 17.20.060(A) above. For example, an Oregon White Oak with a 2" caliper at 6" above the root crown may count as a tree diameter of 4".

TABLE 17.20.060(A)(2)(c) - Large Native and Heritage Tree List

Common Name	**Scientific Name**
Oregon White Oak	*Quercus garryana*
Pacific willow	*Salix lucida spp. lasiandra*
Western red cedar	*Thuja plicata*
Western hemlock	*Tsuga heterophylla*
Northern Red Oak	*Quercus rubra*
Bur Oak	*Quercus macrocarpa*
Bigleaf Maple	*Acer macrophyllum*
Grand Fir	*Abies grandis*
Douglas Fir	*Pseudotsuga menziesii*
American Elm hybrids (disease resistant)	*Ulmus spp.*
Western yew	*Taxus brevifolia*

3. Tree fund. This option may be used where site characteristics or construction preferences do not support the preservation or planting options identified above. The Community Development Director may approved this option in-lieu-of or in addition to requirements (1) and/or (2) above. In this case, the Community Development Director may approve the payment of cash-in-lieu into a dedicated fund for the remainder of trees that cannot be replanted in the manner described above. The large native or heritage tree incentive does not apply when using this option to calculate the number of required inches.

    a. The cash-in-lieu payment per tree shall utilize the adopted fee schedule when calculating the total tree fund payment.

    b. The amount to be paid to the tree fund shall be calculated by subtracting the total inches of trees preserved and planted per section 2 and 3 above from the minimum tree diameter inches required in Table 17.20.060(A), dividing the sum by 2" and multiplying the remainder by the adopted fee from the Oregon City fee schedule. For example:

Lot Size	a. Tree Requirement per Table 17.20.060(A) (inches)	b. Trees Preserved (inches)	c. Trees Planted (inches)	d. To be mitigated (inches) a. – b. – c.	Number of trees owed to tree fund. d. / 2" minimum caliper tree
10,000 – 14,999	10"	2"	4"	4"	2

A. Residential front yard landscaping requirements. The following minimum landscaping standards shall apply to residential uses in residential zones:

1. At a minimum, a three-gallon shrub or three-gallon accent plant shall be planted between the front property line and the front building line for every 4 linear feet of foundation.

2. On lots zoned R-5, R-6, R-8 and R-10, 50% of the area between the front lot line and the front building line shall be landscaped.

3. On lots zoned R-3.5, at least 40% of the area between the front lot line and the front building line shall be landscaped.

4. At a minimum, the required landscaped area shall be planted with ground cover. Up to one-third of the required landscaped area may be for recreational use or for use by pedestrians, such as walkways, play areas or patios.

5. A landscaping plan is required.

Oregon City Municipal Code
Chapter 17.32 C General Commercial District

17.32.010 Designated.

Uses in the general commercial district are designed to serve the city and the surrounding area. Land uses are characterized by a wide variety of establishments such as retail, service, office, multi-family residential, lodging, recreation and meeting facilities or a similar use as defined by the Community Development Director.

17.32.020 Permitted Uses.

A. Any use permitted in the MUC - Mixed Use Corridor zone with no maximum footprint size, unless otherwise restricted in Sections 17.24.020, 17.24.030 or 17.24.040;
B. Hotels and motels
C. Drive-in or drove through facilities
D. Passenger terminals (water, auto, bus, train)
E. Gas Stations
F. Outdoor markets that do not meet 17.29.020.H
G. Motor vehicle and recreational vehicle sales and/or incidental service
H. Motor vehicle and recreational vehicle repair and/or service
I. Custom or specialized vehicle alterations or repair wholly within a building.

17.32.030 Conditional Uses.

The following conditional uses are permitted when authorized and in accordance with the standards contained in Chapter 17.56:
A. Religious Institutions
B. Hospitals
C. Self service storage facilities
D. Public utilities, including sub-stations (such as buildings, plants and other structures);
E. Public and/or Private educational or training facilities
F. Parking structures and lots not in conjunction with a primary use
G. Emergency service facilities (police and fire), excluding correctional facilities;

17.32.040 Prohibited Uses in the General Commercial District.

The following uses are prohibited in the General Commercial District:
A. Distribution, wholesaling and warehousing
B. Outdoor sales or storage (Except secured areas for overnight parking or temporary parking of vehicles used in the business. Sales of products not located under a roof may be allowed if they are located in an area that is architecturally connected to the primary structure, is an ancillary use and is approved through the Site Plan and Design Review process. This area may not exceed 15% of the building footprint of the primary building).
C. General manufacturing or fabrication
D. Heavy equipment service, repair, sales, storage or rental (including but not limited to construction equipment and machinery and farming equipment)

17.32.050 Dimensional Standards.

A. Minimum lot area: none.
B Maximum building height: sixty feet.
C Minimum required setbacks if not abutting a residential zone: none.
D. Minimum required interior and rear yard setbacks if abutting a residential zone: twenty feet, plus one foot additional yard setback for every two feet of building height over thirty-five feet.
E. Maximum Allowed Setbacks.
    1. Front yard setback: five feet (may be expanded with Site Plan and Design Review Section 17.62.055).
    2. Interior side yard setback: none.
    3. Corner side yard setback abutting street: none
    4. Rear yard setback: none.
F Maximum site coverage of building and parking lot: eighty five percent
G. Minimum landscaping requirement (including parking lot): fifteen percent.

Oregon City Municipal Code

Chapter 17.40 Historic Overlay District

17.40.010 Purpose.

It is declared as a matter of public policy that the protection, enhancement, perpetuation and use of improvements of special character or special historical or aesthetic interest or value is a public necessity and is required in the interest of the health, prosperity, safety and welfare of the people. The purpose of this chapter is to:

A. Effect and accomplish the protection, enhancement and perpetuation of such improvements and of districts which represent or reflect elements of the city's cultural, social, economic, political and architectural history;
B. Safeguard the city's historic, aesthetic and cultural heritage as embodied and reflected in such improvements and districts;
C. Complement any National Register Historic districts designated in the city;
D. Stabilize and improve property values in such districts;
E. Foster civic pride in the beauty and noble accomplishments of the past;
F. Protect and enhance the city's attractions to tourists and visitors and the support and stimulus to business and industry thereby provided;
G. Strengthen the economy of the city;
H. Promote the use of historic districts and landmarks for the education, pleasure, energy conservation, housing and public welfare of the city; and
I. Carry out the provisions of LCDC Goal 5.

17.40.030 Designated.

A. The historic overlay district shall apply to the following:
   1. Historic districts, upon designation in accordance with this section;
   2. Conservation districts designated in accordance with this section;
   3. Landmarks as designated by this section; and
   4. Historic corridors designated in accordance with this section.
B. The boundaries of the historic districts, the boundaries of conservation districts, historic corridors, the location of buildings and structures in conservation districts and the location of landmarks shall be designated on a special city zoning map or maps.
C. The following are designated within the historic overlay district:
   1. The Canemah Historic District; the minimum boundaries of which are those designated by the United States Department of the Interior on the National Register of Historic Places as indicated in the city comprehensive plan.
   2. The McLoughlin Conservation District; the surveyed buildings indicated by map in the comprehensive plan shall constitute the designated structures in the McLoughlin Conservation District, along with any structures designated through the Historic Review Board designation process since initial adoption of the comprehensive plan on March 13, 1980.
   3. The Oregon Trail-Barlow Road Historic Corridor: properties identified in the 1993 Barlow Road Historic Corridor inventory of the Barlow Road by Clackamas County.
   4. Designations undertaken pursuant to Section 17.40.050. The established historic overlay district shall allow for the designation of two types of districts so that areas with a high concentration of historic structures are designated historic districts and areas with a lower concentration are designated conservation districts. Also allowed is the designation of structures of historic or architectural significance not located in an historic or conservation district as landmarks.

17.40.040 Citizen involvement.

A. The planning department shall be authorized to incur expenses in holding public workshops in the historic districts and conservation districts, distribute written information, show slides and answer questions on remodeling and rehabilitation of older buildings, and to educate the public in the need to comply with state and federal laws protecting or encouraging protection of antiquities and other related matters concerning historic preservation.

B. Citizens making applications for district or landmark designations or for exterior alterations or new construction in an historic or conservation district, and historic corridor or on a landmark site may consult with and receive advice from the planning department staff concerning their applications.

17.40.050 Designation procedure--Application--Review.

A. Institution of Proceedings. The city commission, the planning commission, the historic review board, a recognized neighborhood group or any interested person may initiate the proceedings for designation of an historic or conservation district, landmark, or historic corridor as follows:

1. The city commission or the historic review board may initiate designation proceedings by sending a written proposal or application to the planning staff. Such proposal is not subject to any minimal information requirements other than a description of the boundaries of the area to be designated.
2. Any interested person or recognized neighborhood group may start designation proceedings by sending a written application to the planning staff.

B. Application Information. The planning staff may specify the information required in an application and may from time to time change the content of that information, but at all times the planning staff shall require the following information:

1. The applicant's name and address;
2. The owner's name and address, if different from the applicant;
3. A description of the boundaries of the proposed district or a description of the proposed landmark;
4. A map illustrating the boundaries of the proposed district or the location of the proposed landmark;
5. A statement explaining the following:
    a. The reasons why the proposed district or landmark should be designated,
    b. The reason why the boundaries of the proposed district are adequate and suitable for designation,
    c. The positive and negative effects, if any, which designation of the proposed district or landmark would have on the residents or other property owners of the area.

C. The planning staff shall deliver a proposal or an application for the designation to the historic review board within thirty days after the day on which a proposal or application is received. The historic review board shall review the proposal on the application and prepare a written recommendation or decision approving or rejecting the proposed designation.

D. In preparing the recommendation or decision, the historic review board shall limit its review to:

1. Whether the proposed district or landmark would serve the purpose of the historic overlay district as stated in Section 17.40.010; and
2. Conformity with the purposes of the city comprehensive plan.

E. City Commission Review of District.

1. The historic review board shall deliver a copy of its recommendation to the city commission within thirty days.
2. The city commission shall hold a public hearing pursuant to procedures contained in Chapter 17.68.
3. After the hearing, the city commission may engage in one of the following actions:

a. Refuse to designate the proposed district; or
b. Designate the proposed district by a duly enacted ordinance; or
c. Remand the matter to the historic review board for additional consideration of a specific matter or matters.

4. The city commission may limit itself to the proposed district, and as so modified, approve it. Enlargement of the proposed district shall require additional notice and public hearing. The commission may hold such hearing or hearings.
5. The approval or disapproval of the designation by the city commission shall be I n writing and shall state the reasons for approval or disapproval.
6. Amendment or Rescission. The district designation may be amended or rescinded after the board and city commission have utilized the same procedures required by this title for establishment of the designation. The board shall give priority to designation of potential districts and landmarks indicated in the city comprehensive plan.

17.40.060 Exterior Alteration and New Construction.

A. Except as provided pursuant to subsection I of this section, no person shall alter any historic site in such a manner as to affect its exterior appearance, nor shall there be any new construction in an historic district, conservation district, historic corridor, or on a landmark site, unless a certificate of appropriateness has previously been issued by the historic review board. Any building addition that is thirty percent or more in area of the historic building (be it individual or cumulative) shall be considered new construction in a district. Further, no major public improvements shall be made in the district unless approved by the board and given a certificate of appropriateness.

B. Application for such a certificate shall be made to the planning staff and shall be referred to the historic review board. The application shall be in such form and detail as the board prescribes.

C. Archeological Monitoring Recommendation. For all projects that will involve ground disturbance, the applicant shall provide,

1. A letter or email from the Oregon State Historic Preservation Office Archaeological Division indicating the level of recommended archeological monitoring on-site, or demonstrate that the applicant had notified the Oregon State Historic Preservation Office and that the Oregon State Historic Preservation Office had not commented within 45 days of notification by the applicant; and
2. A letter or email from the applicable tribal cultural resource representative of the Confederated Tribes of the Grand Ronde, Confederated Tribes of the Siletz, Confederated Tribes of the Umatilla, Confederated Tribes of the Warm Springs and the Confederated Tribes of the Yakama Nation indicating the level of recommended archeological monitoring on-site,or demonstrate that the applicant had notified the applicable tribal cultural resource representative and that the applicable tribal cultural resource representative had not commented within 45 days of notification by the applicant.

If, after 45 days notice from the applicant, the Oregon State Historic Preservation Office or the applicable tribal cultural resource representative fails to provide comment, the city will not require the letter or email as part of the completeness review. For the purpose of this section, ground disturbance is defined as the movement of native soils.

D. The historic review board, after notice and public hearing held pursuant to Chapter 17.50, shall approve the issuance, approve the issuance with conditions or disapprove issuance of the certificate of appropriateness.

2. The following exterior alterations to historic sites may be subject to administrative approval:

a. Work that conforms to the adopted Historic Review Board Policies.

E. For exterior alterations of historic sites in an historic district or conservation district or individual landmark, the criteria to be used by the board in reaching its decision on the certificate of appropriateness shall be:

1. The purpose of the historic overlay district as set forth in Section 17.40.010;
2. The provisions of the city comprehensive plan;
3. The economic use of the historic site and the reasonableness of the proposed alteration and their relationship to the public interest in the structure's or landmark's preservation or renovation;
4. The value and significance of the historic site;

5. The physical condition of the historic site;
6. The general compatibility of exterior design, arrangement, proportion, detail, scale, color, texture and materials proposed to be used with the historic site;
7. Pertinent aesthetic factors as designated by the board;
8. Economic, social, environmental and energy consequences; and
9. Design guidelines adopted by the historic review board.

F. For construction of new structures in an historic or conservation district, or on an historic site, the criteria to be used by the board in reaching its decision on the certificate of appropriateness shall include the following:
1. The purpose of the historic conservation district as set forth in Section 17.40.010;
2. The provisions of the city comprehensive plan;
3. The economic effect of the new proposed structure on the historic value of the district or historic site;
4. The effect of the proposed new structure on the historic value of the district or historic site;
5. The general compatibility of the exterior design, arrangement, proportion, detail, scale, color, texture and materials proposed to be used in the construction of the new building or structure
6. Economic, social, environmental and energy consequences;
7. Design guidelines adopted by the historic review board.

G For construction of new structures in an historic corridor, the criteria to be used by the board in reaching its decision on the certificate of appropriateness shall include the following:
1. The purpose of the historic overlay district as set forth in Section 17.40.010;
2. The policies of the city comprehensive plan;
3. The impact on visible evidence of the trail;
4. The impact on archaeological evidence when there exists documented knowledge of archeological resources on the property;
5. The visual impact of new construction within the historic corridor; and
6. The general compatibility of the site design and location of the new construction with the historic corridor considering the standards of subsection G of this section.

H The following standards apply to development within historic corridors:
1. Within the Oregon Trail-Barlow Road historic corridor, a minimum of a thirty-foot wide-open visual corridor shall be maintained and shall follow the actual route of the Oregon Trail, if known. If the actual route is unknown, the open visual corridor shall connect within the open visual corridor on adjacent property.
2. No new building or sign construction shall be permitted within required open visual corridors. Landscaping, parking, streets, driveways are permitted within required open visual corridors.

I. In rendering its decision, the board's decision shall be in writing and shall specify in detail the basis therefore.

J Nothing in this section shall be construed to prevent the ordinary maintenance or repair of any exterior architectural features which does not involve a change in design, material or the outward appearance of such feature which the building official shall certify is required for the public safety because of its unsafe or dangerous condition.

K The following exterior alterations may be made subject to the administrative procedures as outlined below:

Construction of fences on historic sites.

Exterior alterations, excluding additions, to incompatible structures in the Canemah Historic District.

1. A notice of the proposed certificate of appropriateness shall be mailed to the following persons:
   a. The applicant;
   b. All owners of property within three hundred feet of the property which is the subject of application;
   c. A recognized neighborhood association and a citizen involvement committee representative of the neighborhood involved, if the property which is the subject of the application lies wholly or partially within the boundaries of such organization.
2. The failure of the property owner to receive notice shall not invalidate the action if a good faith attempt was made to notify all persons entitled to personal notice.
3. Notice shall also be given by publication in a newspaper of general circulation in the area affected.

4. Within ten days of the issuance of notice of the proposed certificate of appropriateness, any person who has received personal notice pursuant to subdivision 1 of this subsection or who demonstrates sufficient interest in the outcome to participate in such proceedings, as determined by the historic review board, may request a public hearing before the historic review board.
5. Within forty-five days after a request for public hearing is made, a public hearing shall be held before the historic review board following procedures as established in Chapter 17.50.
6. The historic review board shall then deny or approve the application, either with or without conditions, following procedures as established in Chapter 17.50.
7. In the event no request for hearing is filed, the historic review board, through its chairperson and planning staff, shall issue a certificate of appropriateness in accordance with the notice given without further hearing.
8. The board may adopt policies for review of applications of certificates of appropriateness in the historic overlay district. Such policies shall be adopted only after notice and an opportunity to be heard is provided and shall include specific opportunity for comment by the planning staff, the planning commission, and the city commission. Such policies shall carry out the city's comprehensive plan, especially those elements relating to historic preservation. In the absence of such policies, the board shall apply such elements directly.

17.40.65 Historic Preservation Incentives

A. Purpose. Historic preservation incentives increase the potential for historically designated properties to be used, protected, renovated, and preserved. Incentives make preservation more attractive to owners of locally designated structures because they provide flexibility and economic opportunities.
B. Eligibility for historic preservation incentives. All exterior alterations of designated structures and new construction in historic and conservation districts are eligible for historic preservation incentives if the exterior alteration or new construction has received a certificate of appropriateness from the Historic Review Board per OCMC 17.50.110(c)
C. Incentives allowed. The dimensional standards of the underlying zone as well as for accessory buildings (OCMC 17.54.100) may be adjusted to allow for compatible development if the expansion or new construction is approved through historic design review.
D. Process. The applicant must request the incentive at the time of application to the Historic Review Board.

17.40.070 Demolition and moving.

A. If an application is made for a building or moving permit to demolish or move all or part of a structure which is a landmark or which is located in a conservation district or an historic district, the building inspector shall, within seven days, transmit to the historic review board a copy of the transaction.
B. The historic review board shall hold a public hearing within forty-five days of application pursuant to the procedures in Chapter 17.50.
C. In determining the appropriateness of the demolition or moving as proposed in an application for a building or moving permit, the board shall consider the following:
    1. All plans, drawings and photographs as may be submitted by the applicant;
    2. Information presented to a public hearing held concerning the proposed work;
    3. The city comprehensive plan;
    4. The purpose of this section as set forth in Section 17.40.010;
    5. The criteria used in the original designation of the landmark or district in which the property under consideration is situated;
    6. The historical and architectural style, the general design, arrangement, materials of the structure in question or its fixtures; the relationship of such features to similar features of the other buildings within the district and the position of the building or structure in relation to public rights-of-way and to other buildings and structures in the area;

7. The effects of the proposed work upon the protection, enhancement, perpetuation and use of the district, which cause it to possess a special character or special historical or aesthetic interest or value;
8. Whether denial of the permit will involve substantial hardship to the applicant, and whether issuance of the permit would act to the substantial detriment of the public welfare and would be contrary to the intent and purposes of this section;
9. The economic, social, environmental and energy consequences.

D. The failure of the applicant to provide the information required by Subsection C(1)-(9) shall be grounds for deeming the application incomplete.

E. The board may approve or deny the demolition or moving request after considering the criteria contained in Section 17.40.070(C). Action by the board approving or denying the issuance of a permit for demolition or moving may be appealed to the city commission by any aggrieved party, by filing a notice of appeal, in the same manner as provided in Section 17.50 for appeals. If no appeal of a demolition permit is filed, the building official shall issue the permit in compliance with all other codes and ordinances of the city.

F In any case where the city commission has ordered the removal or demolition of any structure determined to be dangerous to life, health or property, nothing contained in this title shall be construed as making it unlawful for any person, without prior approval of the historic review board, pursuant to this title, to comply with such order.

Oregon City Municipal Code
Chapter 17.41 Tree Protection Standards

17.41.010 Protection of Trees- Intent.

The intent of this chapter is to ensure that new development is designed in a manner that preserves trees to the maximum extent practicable. As a requirement of any Type II land use application, the siting of structures, roadways and utility easements, shall provide for the protection of tree resources to the maximum extent practicable. This chapter applies to all subdivision, partition and site plan and design review applications.

17.41.020 Tree Protection – Applicability.

1. Applications for development subject to Chapter 16.08 or 16.12 (Subdivision or Minor Partition) or Chapter 17.62 (Site Plan and Design Review) shall demonstrate compliance with these standards as part of the review proceedings for those developments.
2. For public capital improvement projects, the City Engineer shall demonstrate compliance with these standards pursuant to a Type II process.
3. Tree canopy removal greater than 25% on sites greater than 25% percent slope, unless exempted under section 17.41.040, shall be subject to these standards.
4. A heritage tree or grove which has been designated pursuant to the procedures of Chapter 12.08.050 shall be subject to the standards of this section.

17.41.030 – Tree Protection - Conflicting Code Provisions.

Except as otherwise specified in this section, where these standards conflict with adopted City development codes or policies, the provision which provides the greater protection for regulated trees or groves, as defined in section 17.04, shall govern.

17.41.040 – Tree Protection – Exemptions.

These regulations are not intended to regulate normal cutting, pruning and maintenance of trees on private property except where trees are located on lots that are undergoing development review or are otherwise protected within the Natural Resource Overlay District (NROD) of section 17.49. These standards are not intended to regulate farm and forest practices as those practices are defined under ORS 30.930.
Farm or forest resources. An applicant for development may claimexemption from compliance with these standards if the development site containing the regulated grove or trees was a designated farm or forest use, tree farm, Christmas tree plantation, or other approved timber use within one year prior to development application. "Forest practices" and "forestlands" as used in this subsection shall have the meaning as set out in ORS 30.930. The Community Development Director has the authority to modify or waive compliance in this case.

17.41.050 - Tree Protection – Compliance Options.

Applicants for review shall comply with these requirements through one or a combination of the following procedures:

A. Option 1 - Mitigation. Retention and removal of trees, with subsequent mitigation by replanting pursuant to section 17.41.060 or 17.41.070. All replanted and saved trees shall be protected by a permanent restrictive covenant or easement approved in form by the city.
B. Option 2 – Dedicated Tract. Protection of trees or groves by placement in a tract within a new subdivision or partition plat pursuant to sections 17.41.080-100; or
C. Option 3 – Restrictive Covenant. Protection of trees or groves by recordation of a permanent restrictive covenant pursuant to section 17.41.110-120.; or
D. Option 4 - Cash-in-lieu of planting pursuant to Section 17.41.130.

A regulated tree that has been designated for protection pursuant to this section must be retained or permanently protected unless it has been determined by a certified arborist to be diseased or hazardous, pursuant to the following applicable provisions.

The Community Development Director, pursuant to a Type II procedure, may allow a property owner to cut a specific number of trees within a regulated grove if preserving those trees would:

(1) Preclude achieving 80% of minimum density with reduction of lot size; or

(2) Preclude meeting minimum connectivity requirements for subdivisions.

17.41.060 - Tree Removal and Replanting - Mitigation (Option 1).

A. Applicants for development who select this option shall ensure that all healthy trees shall be preserved outside the construction area as defined in Chapter 17.04 to the extent practicable. Compliance with these standards shall be demonstrated in a tree mitigation plan report prepared by a certified arborist, horticulturalist or forester or other environmental professional with experience and academic credentials in forestry or arborculture. At the applicant's expense, the City may require the report to be reviewed by a consulting arborist. The number of replacement trees required on a development site shall be calculated separately from, and in addition to, any public or street trees in the public right-of-way required under section 12.08 – Community Forest and Street Trees.

B. The applicant shall determine the number of trees to be mitigated on the site by counting all of the trees 6" DBH (minimum 4.5 feet from the ground) or larger on the entire site and either:

(1) Trees that are removed *outside* of the construction area, shall be replanted with the number of trees specified in Column 1 of Table 17.41.060-1. Trees that are removed *within* the construction area shall be replanted with the number of replacement trees required in Column 2; or

(2) Diseased or hazardous trees, when the condition is verified by a certified arborist to be consistent with the definition in Section 17.04.1360, may be removed from the tree replacement calculation. Regulated healthy trees that are removed *outside of* the construction area, shall be replanted with the number of trees specified in Column 1 of Table 17.41.060-1. Regulated healthy trees that are removed *within* the construction area shall be replanted with the number of replacement trees required in Column 2.

Table 17.41.060-1
Tree Replacement Requirements
All replacement trees shall be either:
2 inch caliper deciduous, or
6 foot high conifer

Size of tree removed	Column 1	Column 2

(DBH)	Number of trees to be planted. (If removed **Outside** of construction area)	Number of trees to be planted. (If removed **Within** the construction area)
6 to 12"	3	1
13 to 18"	6	2
19 to 24"	9	3
25 to 30"	12	4
31 and over"	15	5

Steps for calculating the number of replacement trees:

1. Count all trees measuring 6" DBH (minimum 4.5 feet from the ground) or larger on the entire development site.
2. Designate (in certified arborists report) the condition and size (DBH) of all trees pursuant to accepted industry standards.
3. Document any trees that are currently diseased or hazardous.
4. Subtract the number of diseased or hazardous trees in step (3) from the total number of trees on the development site in step (1). The remaining number is the number of healthy trees on the site. Use this number to determine the number of replacement trees in steps (5) through (8).
5. Define the construction area (as defined in Chapter 17.04)
6. Determine the number and diameter of trees to be removed within the construction area. Based on the size of each tree, use Column 2 to determine the number of replacement trees required.
7. Determine the number and diameter of trees to be removed outside of the construction area. Based on the size of each tree, use Column 1 to determine the number of replacement trees required.
8. Determine the total number of replacement trees from steps (6) and (7).

17.41.070 – Planting Area Priority for Mitigation (Option 1).

Development applications which opt for removal of trees with subsequent replanting pursuant to section 17.41.050(A) shall be required to mitigate for tree cutting by complying with the following priority for replanting standards below:

A. First Priority. Replanting on the development site.
B. Second Priority. Off-site Replacement Tree Planting Locations. If the Community Development Director determines that it is not practicable to plant the total number of replacement trees on-site, a suitable off-site planting location for the remainder of the trees may be approved that will reasonably satisfy the objectives of this section. Such locations may include either publicly owned or private land and must be approved by the Community Development Director.

17.41.080. Tree Preservation within Subdivisions and Partitions – Dedicated Tract (Option 2).

A. Applicants for new subdivision and partition plats may delineate and show the regulated trees or groves as either a separate tract or part of a larger tract that meets the requirements of subsection (D) of this section.
B. The standards for land divisions subject to this section shall apply in addition to the requirements of the City land division ordinance and zoning ordinance, provided that the minimum lot area, minimum

average lot width, and minimum average lot depth standards of the base zone may be superseded in order to allow for a reduction of dimensional standards pursuant to Section 17.41100 below.

C. Prior to preliminary plat approval, the regulated tree or grove area shall be shown either as a separate tract or part of a larger tract that meets the requirements of subsection (D) of this section, which shall not be a part of any parcel used for construction of a structure. The size of the tract shall be the minimum necessary as recommended by a consulting arborist to adequately encompass the dripline of the tree, protect the critical root zone and ensure long term survival of the tree or grove.

D. Prior to final plat approval, ownership of the regulated tree or grove tract shall be identified to distinguish it from lots intended for sale. The tract may be identified as any one of the following:
   1. Private open space held by the owner or a homeowners association; or
   2. For residential land divisions, private open space subject to an easement conveying stormwater and surface water management rights to the City and preventing the owner of the tract from activities and uses inconsistent with the purpose of this document; or
   3. At the owners option, public open space where the tract has been dedicated to the City or other governmental unit; or
   4. Any other ownership proposed by the owner and approved by the Community Development Director. (Ord. 99-1013 §10(part), 1999)

17.41.090. Incentive for Tree Protection Tracts (Option 2).

A. The purpose of this section is to allow dimensional adjustments within a regulated tree protection tract to be transferred outside said tract to the remainder of the site. This provision applies on- site and density shall not be transferred beyond the boundaries of the development site.

B. Development applications for subdivisions and minor partitions that request a density transfer shall:
   1. Provide a map showing the net buildable area of the tree protection tract;
   2. Provide calculations justifying the requested dimensional adjustments
   3. Demonstrate that the minimum lot size requirements can be met based on an average of all lots created, including the tree protection tract created pursuant to Section 17.41.080, 4. Demonstrate that, with the exception of the tree protection tract created pursuant to Section 17.41.080, no parcels have been created which would be unbuildable in terms of minimum yard setbacks;
   5. Meet all other standards of the base zone except as modified in section 17.41.100.

C. The area of land contained in a tree protection tract may be excluded from the calculations for determining compliance with minimum density requirements of the zoning code.

17.41.100. Permitted Modifications to Dimensional Standards (Option 2 Only).

A.An applicant proposing to protect trees in a dedicated tract pursuant to section 17.41.080 may request, and the Community Development Director, pursuant to a Type II procedure, may grant a reduction to, the lot size, width, depth, and setbacks of the underlying zone district in approving a subdivision or partition if necessary to retain a regulated tree or grove in a tract, as long as the calculation of average lot size, including tree protection tracts, meet the minimum lot size for the zone.. The applicant may choose to make the adjustments over as many lots as required. For example, the lot reduction could be spread across all the remaining lots in the proposed subdivision or partition or could be applied to only those needed to incorporate the area of the tree tract.

Table 17.41.100 A
Lot Size Reduction

ZONE	Min. Lot Size (%)	Min. Lot Width	Min. Lot Depth

R-10	5,000 sq. feet	50'	65'
R-8	4,000 sq. feet	45'	60'
R-6	3,500 sq. feet	35'	55'
R-5	3,000 sq. feet	30'	50'
R-3.5	1,800 sq. feet	20'	45'

Table 17.41.100 B

Reduced Dimensional Standards for Detached Single-Family Residential Units

Size of Reduced Lot	Front Yard Setback	Rear Yard Setback	Side yard Setback	Corner Side	Lot Coverage
8,000-9,999 square feet	15 feet	20 feet	7/9 feet	15 feet	40%
6,000-7,999 square feet	10 feet	15 feet	5/7 feet	15 feet	40%
4,000-5,999 square feet	10 feet	15 feet	5/5 feet	10 feet	40%
1,800-3,999 square feet	5 feet	15 feet	5/5 feet	10 feet	55%

Table 17.41.100 C

Reduced Dimensional Standards for Single-Family Attached or Two-Family Residential Units

Size of Reduced Lot	Front Yard Setback	Rear Yard Setback	Side yard Setback	Corner Side	Lot Coverage
3,500-7,000 square feet	10 feet	15 feet	5/0* feet	10 feet	40%
1,800-3,499 square feet	5 feet	15 feet	5/0* feet	10 feet	55%

*0 foot setback is only allowed on single-family attached units

17.41.110. Tree Protection by Restrictive Covenant (Option 3).

Any regulated tree or grove which cannot be protected in a tract pursuant to Section 17.41.080 above shall be protected with a restrictive covenant in a format to be approved by the Community Development Director. Such covenant shall be recorded against the property deed and shall contain provisions to permanently protect the regulated tree or grove unless such tree or grove, as determined by a certified arborist and approved by the Community Development Director, are determined to be diseased or hazardous.

17.41.120. Permitted Adjustments (Option 3 Only).

A. The Community Development Director, pursuant to a Type II procedure, may grant an adjustment to the side, front and rear yard setback standards by up to 50 percent (50%) if necessary to retain a Regulated Tree or Grove through a restrictive covenant pursuant to this section. In no case may the side yard setback be reduce less than 3 feet. The adjustment shall be the minimum necessary to accomplish preservation of trees on the lot and shall not conflict with other conditions imposed on the property.

B. The Community Developmemt Director, pursuant to a Type II procedure, may grant an adjustment to street standards, pursuant to adopted public works standards, in order to preserve a tree. This may

include flexibility to redesign sidewalk and planter strip sizes and locations and allow placement of sidewalks and planter strips in an easement within private lots.

C. The Community Developmemt Director, pursuant to a Type II procedure, may allow other adjustments in order to preserve any healthy tree that cannot be moved due to its size, but will contribute to the landscape character of the area and will not present a foreseeable hazard if retained.

17.41.130 - Cash-in-lieu of Planting (Tree Bank/Fund) (Option 4)

The applicant may choose this option in-lieu-of or in addition to Compliance Options 1 through 3. In this case, the Community Development Director may approve the payment of cash-in-lieu into a dedicated fund for the remainder of trees that cannot be replanted in the manner described above.

A. The cash-in-lieu payment per tree shall be as listed on the adopted fee schedule and shall be adjusted annually based on the Consumer Price Index (Index). The price shall include the cost of materials, transportation and planting.

B. The amount of the cash-in-lieu payment into the tree bank shall be calculated as the difference between the value of the total number of trees an applicant is required to plant, including cost of installation and adjusted for Consumer Price Index, minus the value of the trees actually planted. The value of the trees shall be based on the adopted fee schedule.

17.41.130. Regulated Tree Protection Procedures During Construction.

A. No permit for any grading or construction of public or private improvements may be released prior to verification by the Community Development Director that regulated trees designated for protection or conservation have been protected according to the following standards. No trees designated for removal shall be removed without prior written approval from the Community Development Director.

B. Tree protection shall be as recommended by a qualified arborist or, as a minimum, to include the following protective measures:

1. Except as otherwise determined by the Community Development Director, all required tree protection measures set forth in this section shall be instituted prior to any development activities, including, but not limited to clearing, grading, excavation or demolition work, and such measures shall be removed only after completion of all construction activity, including necessary landscaping and irrigation installation, and any required plat, tract, conservation easement or restrictive covenant has been recorded.
2. Approved construction fencing, a minimum of 4 feet tall with steel posts placed no farther than ten feet apart, shall be installed at the edge of the tree protection zone or dripline, whichever is greater. An alternative may be used with the approval of the Community Development Director.
3. Approved signs shall be attached to the fencing stating that inside the fencing is a tree protection zone, not to be disturbed unless prior approval has been obtained from the Community Development Director.
4. No construction activity shall occur within the tree protection zone, including, but not limited to; dumping or storage of materials such as building supplies, soil, waste items; nor passage or parking of vehicles or equipment.
5. The tree protection zone shall remain free of chemically injurious materials and liquids such as paints, thinners, cleaning solutions, petroleum products, and concrete or dry wall excess, construction debris, or run-off.
6. No excavation, trenching, grading, root pruning or other activity shall occur within the tree protection zone unless directed by an arborist present on site and approved by the Community Development Director.
7. No machinery repair or cleaning shall be performed within 10 feet of the dripline of any trees identified for protection.
8. Digging a trench for placement of public or private utilities or other structure within the critical root zone of a tree to be protected is prohibited. Boring under or through the tree protection zone may be

permitted if approved by the Community Development Director and pursuant to the approved written recommendations and on-site guidance and supervision of a Certified Arborist.

9. The City may require that a Certified Arborist be present during any construction or grading activities that may affect the dripline of trees to be protected.
10. The Community Development Director may impose conditions to avoid disturbance to tree roots from grading activities and to protect trees and other significant vegetation identified for retention from harm. Such conditions may include, if necessary, the advisory expertise of a qualified consulting arborist or horticulturist both during and after site preparation, and a special maintenance/management program to provide protection to the resource as recommended by the arborist or horticulturist.

C. Changes in soil hydrology due to soil compaction and site drainage within tree protection areas shall be avoided. Drainage and grading plans shall include provision to ensure that drainage of the site does not conflict with the standards of this section. Excessive site run-off shall be directed to appropriate storm drainage facilities and away from trees designated for conservation or protection.

Oregon City Municipal Code
Chapter 17.42 Flood Management Overlay District

17.42.010 Purpose--Findings.

A. There is established in the city a flood management overlay district. The flood management overlay district is an overlay zone classification defining areas subject to periodic flooding or inundation which can result in property harm or loss, disruption of public services, hazards for public health, or added expense for public services. All conditions and restrictions of land use established by this chapter of the city's zoning ordinance shall be in addition to such restrictions and conditions as may be imposed and established in underlying zoning districts.

B. It is the purpose of this chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

1. To protect human life and health;
   To minimize expenditure of public money and costly flood control projects;
   To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
2. To minimize prolonged business interruptions;
3. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
4. To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
5. To ensure that potential buyers are notified that property is in an area of special flood hazard;
6. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions; and
7. To protect flood management areas, which provide the following functions:
   a. Protect life and property from dangers associated with flooding,
   b. Flood storage, reduction of flood velocities, reduction of flood peak,
   c. Flows and reduction of wind and wave impacts,
   d. Maintain water quality by reducing and sorting sediment loads,
   e. Processing chemical and organic wastes and reducing nutrients, recharge, store and discharge groundwater, and
   f. Provide plant and animal habitat, and support riparian ecosystems.

17.42.020 Applicability.

A. This chapter shall apply to development in the flood management overlay district, which may also be referred to as the "floodplain overlay district" in this code. The flood management overlay district includes all areas of special flood hazards and all flood management areas within the city. The overlay district restricts the uses that are allowed in the base zone by right, with limitations, or as provisional uses.

B. The flood management areas which have been mapped include the following locations:
   1. Land contained within the one hundred-year floodplain, flood area and floodway as shown on the Federal Emergency Management Agency flood insurance maps dated June 17, 2008, including areas of special flood hazard pursuant to Section 17.42.040 and the area of inundation for the February 1996 flood; and
   2. Lands that have physical or documented evidence of flooding within recorded history

based on aerial photographs of the 1996 flooding and/or the water quality and flood management areas maps.

C. The standards that apply to the flood management areas apply in addition to state or federal restrictions governing floodplains or flood management areas.

17.42.030 Basis for establishing the areas of special flood hazard.

The areas or special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study for Clackamas County, Oregon and Incorporated Areas," dated June 17, 2008, with accompanying flood insurance maps is adopted by reference and declared to be a part of this chapter. The flood insurance study is on file at the office of the city recorder in the City Hall.

17.42.040 Compliance.

No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of these floodplain regulations and other applicable regulations. Violations of the provisions of this chapter by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a civil infraction. Any person who violates this chapter or fails to comply with any of its requirements shall be subject to the enforcement procedures of this code per OCMC 1.20 Civil Infractions and 1.24 Code Enforcement. Nothing herein contained shall prevent the city from taking such other lawful action as is necessary to prevent or remedy.

17.42.050 Abrogation and interpretation.

This chapter is not intended to repeal, abrogate or impair any existing easements, covenants or deed restrictions. All provisions shall be considered as minimum requirements and liberally construed in favor of the governing body. Where this chapter and another section, easement, covenant or deed restriction conflict or overlap, whichever imposes the more stringent restriction shall prevail.

17.42.060 Warning and disclaimer of liability.

The degree of flood protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This chapter does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flooding damages. This chapter shall not create liability on the part of the city, any officer or employee thereof, or the Federal Insurance Administration for any flood damages that result from reliance on this chapter or any administrative decision lawfully made thereunder.

17.42.070 Severability.

The provisions of this chapter are severable. If any section, clause or phrase of this chapter is adjudged to be invalid by a court of competent jurisdiction, the decision of that court shall not affect the validity of the remaining portions of this chapter.

17.42.080 Administration.

This chapter establishes a flood management overlay district, which is delineated on the water quality and flood management areas map attached and incorporated by reference as a part of this document.
A. The following maps and studies are adopted and declared to be a part of this chapter. These maps are on file in the office of the city recorder:
1. The Water Quality and Flood Management Areas Map, dated June 7, 1999;
2. The Federal Insurance Administration, Flood Insurance Rate Maps for Clackamas County, Oregon and Incorporated Areas dated June 17, 2008;

B. Applicants are required to provide the city with a delineation of the flood management areas on the subject property as part of any application. An application shall not be complete until this delineation is submitted to the city.
C. The city shall review the water quality and flood management areas maps during periodic review as required by ORS 197.633 (1997).
D. Development Permit.
1. A development permit shall be obtained before construction or development begins within any portion of the flood management overlay district. The permit shall be for all structures, including manufactured homes and all other development, including fill and other activities, as set forth in Chapter 17.04 (Definitions).
2. Application for a development permit shall be made on forms furnished by the community development department. Requirements may include, but are not limited to: plans in duplicate drawn to scale showing the nature, location, dimensions and elevations of the area in question; existing or proposed structures, fill, storage materials, drainage facilities; and the location of the foregoing.
3. The following information is specifically required:
a. Elevation in relation to mean sea level of the lowest floor (including basement) of all structures;
b. Elevation in relation to mean sea level to which any structure has been floodproofed;
c. Certification by a registered professional engineer or architect that the floodproofing methods for any nonresidential structure meet the floodproofing criteria in Section 17.42.170(E)(5); and
d. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

17.42.090 Building official--Duties and responsibilities.

A. The city building official, defined as the local floodplain administrator, is appointed to administer and implement this chapter by granting or denying development permit applications in accordance with its provisions.
B. Duties of the building official shall include, but not be limited to those listed in this chapter.
C. The building official shall:
   1. Review all development permits to determine that the permit requirements of this title have been satisfied;
   2. Review all development permits to determine that all necessary permits have been obtained from those federal, state or local governmental agencies from which prior approval is required; and
   3. Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the encroachment provisions of Section 17.42.200 are met.

17.42.100 Use of other base flood data.

When base flood elevation data has not been provided in accordance with Section 17.42.030, the building official shall obtain, review and reasonably utilize any base flood elevation and floodway data available from a federal, state or other source, in order to administer Sections 17.42.160 and 17.42.200.

17.42.110 Information to be obtained and maintained.

The building official shall:

A. Where base flood elevation data is provided through the flood insurance study, FIRM or required as in Section 17.42.100, obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structures, and whether or not the structure contains a basement.

B. For all new or substantially improved floodproofed structures where base flood elevation data is provided through the flood insurance study, FIRM, or as required in Section 17.42.080:
   1. Verify and record the actual elevation (in relation to mean sea level); and
   2. Maintain the floodproofing certifications required in Section 17.42.080(C)(3);
   3. Maintain for public inspection all records pertinent to the provisions of this chapter.

17.42.120 Alteration of watercourses.

A. Notify adjacent communities and the department of land conservation and development prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administration.

B. Require that maintenance is provided within the altered or relocated portion of the watercourse so that the flood-carrying capacity is not diminished.

17.42.130 Map administration.

A. The purpose of this section is to provide a process for interpreting and amending the water quality and flood management areas map to clarify and correct the location of flood management overlay district.

B. Interpretation of Map Boundaries. The building official shall make interpretations, where needed, as to exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in Section 17.42.150.

C. Map corrections shall be processed pursuant to the requirements of Chapter 17.68:
   1. Within ninety days of receiving information establishing a possible error in the existence or location of the flood management overlay district, the city shall provide notice to interested parties of a public hearing at which the city will review the information.
   2. The city shall amend the water quality and flood management areas map if the information demonstrates that the boundaries of the flood management overlay district have changed since adoption of the water quality and flood management areas map by Metro (June 18, 1998) provided that, in the case of a boundary established by FEMA, a letter of map amendment (LOMA) or letter of map revision is obtained from FEMA by the applicant prior to any map change.

17.42.140 Appeals and variance procedure.

A. The purpose of this section is to ensure that compliance with this chapter does not cause unreasonable hardship. To avoid such instances, the requirements of this chapter may be

varied. Variances are also allowed when strict application of this chapter would deprive an owner of all economically viable use of land.

B. This section applies to requests to vary from the standards of this chapter only. Requests to vary from other standards of this title shall be subject to the requirements of Chapter 17.60.
1. Variance applications made pursuant to this section shall follow the variance procedures outlined in Chapter 17.50.
2. In addition to the public notice requirements outlined in Section 17.50.090, Metro shall be notified within fourteen days of the city receiving an application to vary the requirements of this section and within fourteen days of a decision on the variance.
3. The requirements of Section 17.60.020 (Variances--Grounds) do not apply to requests to vary from the standards of Chapter 17.42.
4. If an application to vary from the standards of Chapter 17.42 is made in conjunction with an application to vary from other standards of this chapter, the variances may be processed as one application, provided the standards applicable to each variance requested must be met before the requested variance may be granted.

C. Hardship Variance. Variances to avoid unreasonable hardship caused by the strict application of this chapter are permitted subject to the criteria set forth in this section. To vary from the requirements of this chapter, the applicant must demonstrate the following:
1. The variance is the minimum necessary to allow the proposed use or activity;
2. The variance will not increase danger to life and property due to flooding or erosion;
3. The impact of the increase in flood hazard which will result from the variance will not prevent the city from meeting the requirements of this chapter. In support of this criteria the applicant shall have a qualified professional engineer document the expected height, velocity and duration of floodwaters, and estimate the rate of increase in sediment transport of the floodwaters expected both downstream and upstream as a result of the variance;
4. The variance will not increase the cost of providing and maintaining public services during and after flood conditions so as to unduly burden public agencies and taxpayers; and
5. The proposed use complies with the standards of the base zone.

D. The planning commission shall hear and decide appeals and requests for variances when it is alleged there is an error in any requirement, decision or determination made by the building official in the enforcement or administration of these regulations, or that enforcement of this district would result in exceptional hardship. In passing upon such applications, the planning commission shall consider all technical evaluations, all relevant factors, standards specified in other sections of this title, and:
1. The danger that materials may be swept onto other lands to the injury of others;
2. The danger to life and property due to flooding or erosion damage;
3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
4. The importance of the services provided by the proposed facility to the community;
5. The necessity to the facility of a waterfront location, where applicable;
6. The availability of alternative locations for the proposed use, which are not subject to flooding or erosion damage;
7. The compatibility of the proposed use with existing and anticipated development;
8. The relationship of the proposed use to the comprehensive plan and floodplain management program for that area;
9. The safety of access to the property in times of flood for ordinary and emergency vehicles;
10. The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site; and
11. The cost of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water systems, and streets and bridges.

E. Upon consideration of the factors listed in subsection D of this section and the purposes of this district, the planning commission may attach such conditions to the granting of variances as it deems necessary to meet the purposes of this district.
F. The city recorder shall maintain the records of all appeal actions and the building official shall report any granted variances to the Federal Insurance Administration upon request.

17.42.150 Conditions for variances.

The planning commission, pursuant to Chapter 17.60, may impose such conditions as are deemed necessary to limit any adverse impacts that may result from granting relief. If a variance is granted pursuant to Section 17.42.140, the variance shall be subject to the conditions set out in this section. In addition to other standards listed in Section 17.42.160, the following conditions must be met:

A. Variances may be issued for the reconstruction, rehabilitation or restoration of structures listed on the National Register or identified as a locally designated historic structure and without regard to the procedures set forth in the remainder of this chapter.
B. Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.
C. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
D. Variances shall only be issued upon a showing of good and sufficient cause.
E. A determination that failure to grant the variance would result in exceptional hardship to the applicant.
F. Variances as interpreted in the national flood insurance program are based on the general zoning law principle that they pertain to a physical piece or property; they are not personal in nature and do not pertain to the structure, its inhabitants, economic or financial circumstances. They primarily address small lots in densely populated residential neighborhoods. As such, variances from the flood elevations should be quite rare.
G. Variances may be issued for nonresidential buildings in very limited circumstances to allow a lesser degree of floodproofing than watertight or dry-floodproofing, where it can be determined that such action will have low damage potential, complies with all other variance criteria as set forth in this chapter.
H. A variance from the elevation standard may only be issued for new construction, and substantial improvements to be erected on a lot of one-half acre or less in size, that are to contiguous and surrounded by lots with existing structures constructed below the base flood level. As the lot size increases the technical justification required for issuing the variance increases.
I. Variances shall not result in increased flood heights, additional threats to public safety, extraordinary public expenses, cause nuisances, cause fraud on or victimization of the public or conflict with existing laws or ordinances.
J. Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with the lowest flood elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

17.42.160 Flood management area standards.

A. Uses Permitted Outright:
   1. Excavation and fill required to plant any new trees or vegetation.
   2. Restoration or enhancement of floodplains, riparian areas, wetland, upland and streams that

meet federal and state standards provided that any restoration project which encroaches on the floodway complies with the requirements of Section 17.42.190 (Floodways).

B. Provisional Uses.

1. All uses allowed in the base zone or existing flood hazard overlay zone are allowed in the flood management overlay district subject to compliance with the development standards of this section.

C. Prohibited Uses.

1. Any use prohibited in the base zone;

2. Uncontained areas of hazardous materials as defined by the Department of Environmental Quality.

D. Site Development Standards. All development in the floodplain shall conform to the following balanced cut and fill standards:

1. This subsection does not apply to work necessary to protect, repair, maintain or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies provided that, after the emergency has passed, adverse impacts are mitigated in accordance with applicable standards.

2. No net fill in any floodplain is allowed. All fill placed in a floodplain shall be balanced with at least an equal amount of soil material removed. For the purposes of calculating net fill, fill shall include any structure below the design flood elevation that has been floodproofed pursuant to subsection (E)(5) of this section.

3. Any excavation below bankfull stage shall not count toward compensating for fill.

4. Excavation to balance a fill shall be located on the same parcel as the fill unless it is not practicable to do so. In such cases, the excavation shall be located in the same Oregon City floodplain, so long as the proposed excavation and fill will not increase flood impacts for surrounding properties as determined through hydrologic and hydraulic analysis.

5. For excavated areas identified by the city to remain dry in the summer, such as parks or mowed areas, the lowest elevation of the excavated area shall be at least six inches above the winter "low water" elevation, and sloped at a minimum of two percent towards the protected water feature pursuant to Chapter 17.49. One percent slopes will be allowed in smaller areas.

6. For excavated areas identified by the city to remain wet in the summer, such as a constructed wetland, the grade shall be designed not to drain into the protected water feature pursuant to Chapter 17.49.

7. Parking areas in the floodplain shall be accompanied by signs that inform the public that the parking area is located in a flood management area and that care should be taken when the potential for flooding exists.

8. Temporary fills permitted during construction shall be removed at the end of construction, thirty days after subdivision acceptance or completion of the final inspection.

9. New culverts, stream crossings and transportation projects shall be designed as balanced cut and fill projects or designed not to significantly raise the design flood elevation. Such projects shall be designed to minimize the area of fill in flood management areas and to minimize erosive velocities. Stream crossings shall be as close to perpendicular to the stream as practicable. Bridges shall be used instead of culverts wherever practicable.

10. Excavation and fill required for the construction of detention facilities or structures, and other facilities, such as levees, specifically shall be designed to reduce or mitigate flood impacts and improve water quality. Levees shall not be used to create vacant buildable lands.

E. Construction Standards.

1. Anchoring.

a. All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure.

b. All manufactured homes must likewise be anchored to prevent flotation, collapse or lateral movements and shall be installed using methods and practices that minimize flood damage.

Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (reference FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebooks for additional techniques).

2. Construction Materials and Methods.

a. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

b. All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.

c. Electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

3. Utilities.

a. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.

b. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharge from the systems into floodwaters.

c. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

4. Residential Construction.

a. New construction and substantial improvements of any residential structure shall have the lowest floor, including basement, elevated to at least one foot above the design flood elevation.

b. Fully enclosed areas below the lowest floor that are subject to flooding are prohibited unless they are designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:

i. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.

ii. The bottom of all openings shall be no higher than one foot above grade.

iii. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

5. Nonresidential Construction.

a. New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated to at least one foot above base flood elevation; or, together with attendant utility and sanitary facilities, shall:

i. Be floodproofed so that below the design flood level the structure is watertight with walls substantially impermeable to the passage of water provided that the requirements of subsection (D)(2) of this section are met;

ii. Have structured components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;

iii. Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications and plans. Such certifications shall be provided to the official as set forth in Section 17.42.110(B);

iv. Nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in subsection (E)(4)(b) of this section; and

v. Applicants floodproofing nonresidential buildings shall be notified that flood insurance

premiums will be based on rates that are one foot below the floodproofed level (e.g., a building constructed to the design flood level will be rated as one foot below that level).
vi. Manufactured Homes. The following standards apply to all manufactured homes to be placed or substantially improved on sites within Flood Hazard Areas
When manufactured dwellings are installed in flood hazard areas, they shall be elevated and anchored according to the Oregon Residential Specialty Code.

F. Recreational Vehicles. Recreational vehicles placed on sites within Zones A1-30, AH and AE as shown on the flood insurance rate map shall:
1. Be on site for fewer than one hundred eighty consecutive days, and be fully licensed and ready for highway use, on its wheels or jacking system, attached to the site only by quick disconnect type utilities and security devices, and have no permanently attached additions; or
2. Meet the requirements of subsection (E)(6) of this section and the elevation and anchoring requirements for manufactured homes.

G. Below Grade Crawlspaces. Below grade crawlspaces are allowed subject to the following standards. It should be noted that there are potential increased charges to personal insurance costs for below grade crawlspaces.
1. The building shall be designed and adequately anchored to resist flotation, collapse, and lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. Hydrostatic loads and effects of buoyancy can usually be addressed through the required openings stated in section 2 below. Because of hydrodynamic loads, crawlspace construction is not allowed in areas with flood velocities greater than five feet per second unless the design is reviewed by a qualified design professional, such as a registered architect or professional engineer. Other types of foundations are recommended for these areas.
2. The crawlspace is an enclosed area below the base flood elevation (BFE) and, as such, must have openings openings that equalize hydrostatic pressures by allowing the automatic entry and exit of floodwaters. The bottom of each flood vent opening can be no more than one foot above the lowest adjacent exterior grade.
3. Portions of the building below the BFE must be constructed with materials resistant to flood damage. This includes not only the foundation walls of the crawlspace used to elevate the building, but also any joists, insulation, or other materials that extend below the BFE. The recommended construction practice is to elevate the bottom of joists and all insulation above BFE.
4. Any building utility systems within the crawlspace must be elevated above BFE or designed so that floodways cannot enter or accumulate within the system components during flood conditions. Ductwork, in particular, must either be placed above the BFE or sealed from floodwaters. 5. The interior grade of a crawlspace below the BFE must not be more than two feet below the lowest adjacent exterior grade.
6. The height of the below-grade crawlspace, measured from the interior grade of the crawlspace to the top of the crawlspace foundation wall must not exceed four feet at any point. The height limitations is the maximum allowable unsupported wall height according to the engineering analyses and building code requirements for flood hazard areas.
7. There must be an adequate drainage system that removes floodwaters from the interior area of the crawlspace. The enclosed area should be drained within a reasonable time after a flood event. The type of drainage system will vary because of the site gradient and other drainage characteristics, such as soil types. Possible options include natural drainage through porous, well-drained soils and drainage systems such as perforated pipes, drainage tiles or gravel or crushed stone drainage by gravity or mechanical means.

8. The velocity of floodwaters at the site should not exceed five feet per second for any crawlspace. For areas with floodwater velocities in excess of five feet per second, below grade crawlspaces are prohibited.

17.42.170 Review of building permits.

Where elevation data is not available either through the flood insurance study, FIRM or from another authoritative source (Section 17.42.110), application for building permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness shall be made by the building official, considering use of historical data, high water marks, photographs of past floodings, etc., where available, and the provisions of this title. Failure to elevate at least two feet above grade in these zones may result in higher insurance rates.

17.42.180 Subdivision standards.

A. Subdivision Proposals.
1. All subdivision proposals shall be consistent with the need to minimize flood damage.
2. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize or eliminate flood damage.
3. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage.
4. Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least fifty lots or five acres (whichever is less).
5. All structures and site grading developed or conducted in conjunction with a subdivision proposal shall comply with Section 17.42.160, flood management area standards.

B. The purpose of this section is to allow density accruing to portions of a property within the flood management overlay district to be transferred outside the overlay district.
1. Density transfers shall be allowed if the applicant demonstrates compliance with the following standards:
a. The density transfer is proposed as part of a subdivision.
b. Minimum density standards will not increase due to the density transfers.
c. The area of land contained in a flood management area may be excluded from the calculations for determining compliance with minimum density requirements of the zoning code.

17.42.190 Floodways.

Located within areas of special flood hazard established in Section 17.42.030 are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles and erosion potential, the following provisions apply:

A. Encroachments, including fill, new construction, substantial improvements and other development shall be prohibited unless certification by a registered professional engineer or architect is provided demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

B. If subsection A of this section is satisfied, all new construction and substantial improvements shall comply with all applicable flood management area standards of Sections 17.42.160 through 17.42.190.

C. Below-grade crawlspace construction is allowed in the floodplain in accordance with the Oregon Residential Specialty Code and the Oregon State Structural Specialty Code as adopted by local building code.
D. In areas where a regulatory floodway has not been designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE on the community's FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

Oregon City Municipal Code
Chapter 17.44 US – Geologic Hazards

17.44.010 Intent and Purpose.

The intent and purpose of the provisions of this chapter are:

A. To ensure that activities in geologic hazard areas are designed based on detailed knowledge of site conditions in order to reduce the risk of private and public losses;
B. To establish standards and requirements for the use of lands within geologic hazard areas;
C. To provide safeguards to prevent undue hazards to property, the environment, and public health, welfare, and safety in connection with use of lands within geologic hazard areas;
D. To mitigate risk associated with geologic hazard areas, not to act as a guarantee that the hazard risk will be eliminated, nor as a guarantee that there is a higher hazard risk at any location. Unless otherwise provided, the geologic hazards regulations are in addition to generally applicable standards provided elsewhere in the Oregon City Municipal Code.

17.44.025 When Required; Regulated Activities; Permit and Approval Requirements.

No person shall engage in any of the following regulated activities within the adopted Oregon City Geologic Hazards Overlay Zone as defined in section 17.04.515 of the Oregon City Municipal Code without first obtaining permits or approvals as required by this chapter:

A. Installation or construction of an accessory structure greater than 500 square feet in area;
B. Development of land, construction, reconstruction, structural alteration, relocation or enlargement of any building or structure for which permission is required pursuant to the Oregon City Municipal Code;
C. Tree removal on slopes greater than 25% where canopy area removal exceeds 25% of the lot.
D. Excavation which exceeds two feet in depth, or which involves twenty-five or more cubic yards of volume;

The requirements of this chapter are in addition to other provisions of the Oregon City Municipal Code. Where the provisions of this chapter conflict with other provisions of the Oregon City Municipal Code, the provisions that are the more restrictive of regulated development activity shall govern.

17.44.030 Procedures.

No building or site development permit or other authorization for development shall be issued until the plans and other documents required by this chapter have been reviewed and found by the review authority to comply with the requirements of this chapter.

A. Where the development is part of a land use permit application, review shall occur in the manner established in Chapter 17.50 for review of land use decisions.
B. Where the development is part of a limited land use permit application, review shall occur in the manner established in Chapter 17.50 for review of limited land use decisions.
C. Where the development is solely part of a grading permit or building permit, the City Engineer may allow review to occur in the manner established in Title 15, Chapter 15.04 and 15.48 if the application meets 17.44.060 development standards.
D. For any other proposed development not otherwise subject to review as a land use or limited land use permit application, review shall occur in the manner established in Chapter 17.50 for limited land use decisions.

17.44.035 Exemptions.

The following activities, and persons engaging in same, are EXEMPT from the provisions of this chapter.

A. An excavation which is less than two feet in depth, or which involves less than twenty-five cubic yards of volume;
B. A fill which does not exceed two feet in depth or twenty-five cubic yards of volume;
C. Structural alteration of any structure of less than 500 square feet that does not involve grading as defined in this chapter;
D. Installation, construction, reconstruction, or replacement of utility lines in city right-of-way, or public easement, not including electric substations;
E. The removal or control of noxious vegetation;
F. Emergency actions which must be undertaken immediately to prevent an imminent threat to public health or safety, or prevent imminent danger to public or private property. The person undertaking emergency action shall notify the Building Official on all regulated activities associated with any building permit or City Engineer/Public Works Director on all others within one working day following the commencement of the emergency activity. If the City Engineer/Public Works Director or Building Official determine that the action or part of the action taken is beyond the scope of allowed emergency action, enforcement action may be taken.

17.44.050 Development - Application Requirements and Review Procedures and Approvals.

Except as provided by subsection B of this section, the following requirements apply to all development proposals subject to this chapter:

A. A geological assessment and geotechnical report that specifically includes, but is not limited to:
    1) Comprehensive information and data regarding the nature and distribution of underlying geology, the physical and chemical properties of existing soils and groundwater; an opinion of site geologic stability, and conclusions regarding the effect of geologic conditions on the proposed development. In addition to any field reconnaissance or subsurface investigation performed for the site, the following resources, as a minimum, shall be reviewed to obtain this information and data:
        a) The State of Oregon Department of Geology and Mineral Industries (DOGAMI) in Bulletin 99, Geology and Geological Hazards of North Clackamas County, Oregon (1979), or in any subsequent DOGAMI mapping for the Oregon City area;
        b) Portland State University study entitled "Environmental Assessment of Newell Creek Canyon, Oregon City, Oregon" (1992);
        c) Portland State University study, "Landslides in the Portland, Oregon, Metropolitan Area Resulting from the Storm of February 1996: Inventory Map, Database and Evaluation" (Burns and others, 1998);
        d) DOGAMI Open File Report O-06-27, "Map of Landslide Geomorphology of Oregon City, Oregon, and Vicinity Interpreted from LIDAR Imagery and Aerial Photographs" (Madin and Burns, 2006);
        e) "Preliminary Geologic Map of the Oregon City Quadrangle, Clackamas County, Oregon" (Madin, in press);
    2) Information and recommendations regarding existing local drainage, proposed permit activity impacts on local drainage, and mitigation to address adverse impacts;
    3) Comprehensive information about site topography;
    4) Opinion as to the adequacy of the proposed development from an engineering standpoint;
    5) Opinion as to the extent that instability on adjacent properties may adversely affect the project;

6) Description of the field investigation and findings, including logs of subsurface conditions and laboratory testing results;
7) Conclusions regarding the effect of geologic conditions on the proposed development, tree removal, or grading activity;
8) Specific requirements and recommendations for plan modification, corrective grading, and special techniques and systems to facilitate a safe and stable site;
9) Recommendations and types of considerations as appropriate for the type of proposed development:
    a. General earthwork considerations, including recommendations for temporary and permanent cut and fill slopes and placement of structural fill,
    b. Location of residence on lot,
    c. Building setbacks from slopes,
    d. Erosion control techniques applicable to the site,
    e. Surface drainage control to mitigate existing and potential geologic hazards,
    f. Subdrainage and/or management of groundwater seepage,
    g. Foundations,
    h. Embedded/retaining walls,
    i. Management of surface water and irrigation water, and
    j. Impact of the development on the slope stability of the lot and the adjacent properties.
10) Scaled drawings that describe topography and proposed site work, including:
    a. Natural physical features, topography at two or ten-foot contour intervals locations of all test excavations or borings, watercourses both perennial and intermittent, ravines and all existing and manmade structures or features all fully dimensioned, trees six-inch caliper or greater measured four feet from ground level, rock outcroppings and drainage facilities;
    b. All of the features and detail required for the site plan above, but reflecting preliminary finished grades and indicating in cubic yards whether and to what extent there will be a net increase or loss of soil.
    c. A cross-section diagram, indicating depth, extent and approximate volume of all excavation and fills.
12) For properties greater than 1 acre, a preliminary hydrology report, prepared by a suitably qualified and experienced hydrology expert, addressing the effect upon the watershed in which the proposed development is located; the effect upon the immediate area's stormwater drainage pattern of flow, the impact of the proposed development upon downstream areas and upon wetlands and water resources; and the effect upon the groundwater supply.

B. Review Procedures and Approvals require the following:

1) Examination to ensure that:
    a) Required application requirements are completed;
    b) Geologic assessment and geotechnical report procedures and assumptions are generally accepted; and
    c) All conclusions and recommendations are supported and reasonable.
2) Conclusions and recommendations stated in an approved assessment or report shall then be directly incorporated as permit conditions or provide the basis for conditions of approval for the regulated activity.
3) All geologic assessments and geotechnical reports shall be reviewed by an engineer certified for expertise in geology or geologic engineering and geotechnical engineering, respectively, as determined by the City. The City will prepare a list of prequalified consultants for this purpose. The cost of review by independent review shall be paid by the applicant.

C. The city engineer may waive one or more requirements of subsections A and B of this section if the city engineer determines that site conditions, size or type or development of grading

requirements do not warrant such detailed information. If one or more requirements are waived, the city engineer shall, in the staff report or decision, identify the waived provision(s), explain the reasons for the waiver, and state that the waiver may be challenged on appeal and may be denied by a subsequent review authority.

17.44.060 Development Standards.

Notwithstanding any contrary dimensional or density requirements of the underlying zone, the following standards shall apply to the review of any development proposal subject to this chapter. Requirements of this chapter are in addition to other provision of the Oregon City Municipal Code. Where provision of this chapter conflict with other provision of the Oregon City Municipal Code , the provisions that are more restrictive of regulated development activity shall govern.

A. All developments shall be designed to avoid unnecessary disturbance of natural topography, vegetation and soils. To the maximum extent practicable as determined by the review authority, tree and ground cover removal and fill and grading for residential development on individual lots shall be confined to building footprints and driveways, to areas required for utility easements and for slope easements for road construction, and to areas of geotechnical remediation.
B. All grading, drainage improvements, or other land disturbances shall only occur from May 1 to October 31. Erosion control measures shall be installed and functional prior to any disturbances. The City Engineer may allow grading, drainage improvements or other land disturbances to begin before May 1 (but no earlier than March 16) and end after October 31 (but no later than November 30), based upon weather conditions and in consultation with the project geotechnical engineer. The modification of dates shall be the minimum necessary, based upon the evidence provided by the applicant, to accomplish the necessary project goals. Temporary protective fencing shall be established around all trees and vegetation designed for protection prior to the commencement of grading or other soil disturbance.
C. Designs shall minimize the number and size of cuts and fills.
D. Cut and fill slopes, such as those for a street, driveway accesses, or yard area, greater than seven feet in height (as measured vertically) shall be terraced. Faces on a terraced section shall not exceed five feet. Terrace widths shall be a minimum of three feet and shall be vegetated. Total cut and fill slopes shall not exceed a vertical height of fifteen feet. Except in connection with geotechnical remediation plans approved in accordance with the chapter, cuts shall not remove the toe of any slope that contains a known landslide or is greater than twenty-five percent slope. The top of cut or fill slopes not utilizing structural retaining walls shall be located a minimum of one-half the height of the cut slope from the nearest property line.
E. Any structural fill shall be designed by a suitably qualified and experienced civil or geotechnical engineer licensed in Oregon in accordance with standard engineering practice. The applicant's engineer shall certify that the fill has been constructed as designed in accordance with the provisions of this chapter.
F. Retaining walls shall be constructed in accordance with the Oregon Structural Specialty Code adopted by the State of Oregon.
G. Roads shall be the minimum width necessary to provide safe vehicle and emergency access, minimize cut and fill and provide positive drainage control. The review authority may grant a variance from the City's required road standards upon findings that the variance would provide safe vehicle and emergency access and is necessary to comply with the purpose and policy of this chapter.
H. Density shall be determined as follows
    1) For those areas with slopes less than twenty-five percent between grade breaks, the allowed density shall be that permitted by the underlying zoning district;

2) For those areas with slopes of twenty-five to thirty-five percent between grade breaks, the density shall not exceed two dwelling units per acre except as otherwise provided in subsection I of this section;
3) For those areas with slopes over thirty-five percent between grade breaks, development shall be prohibited except as otherwise provided in subsection I 4 of this section.

I. For properties with slopes of twenty-five to thirty-five percent between grade breaks:
1) For those portions of the property with slopes of twenty-five to thirty-five percent, the maximum residential density shall be limited to two dwelling units per acre; provided, however, that where the entire site is less than one-half acre in size, a single dwelling shall be allowed on a lot or parcel existing as of January 1, 1994 and meeting the minimum lot size requirements of the underlying zone;
2) An individual lot or parcel with slopes between twenty-five and thirty-five percent shall have no more than fifty percent or four thousand square feet of the surface area, whichever is smaller, graded or stripped of vegetation or covered with structures or impermeable surfaces.
3) No cut into a slope of twenty-five to thirty-five percent for the placement of a housing unit shall exceed a maximum vertical height of 15 feet for the individual lot or parcel.
4) For those portions of the property with slopes over thirty-five percent between grade breaks:
a. Notwithstanding any other City land use regulation, development other than roads, utilities, public facilities and geotechnical remediation shall be prohibited; provided, however, that the review authority may allow development upon such portions of land upon demonstration by an applicant that failure to permit development would deprive the property owner of all economically beneficial use of the property. This determination shall be made considering the entire parcel in question and contiguous parcels in common ownership on or after January 1, 1994, not just the portion where development is otherwise prohibited by this chapter. Where this showing can be made on residentially zoned land, development shall be allowed and limited to one single-family residence. Any development approved under this chapter shall be subject to compliance with all other applicable City requirements as well as any applicable State, Federal or other requirements;
b. To the maximum extent practicable as determined by the review authority, the applicant shall avoid locating roads, utilities, and public facilities on or across slopes exceeding thirty-five percent.

J. The geotechnical engineer of record shall review final grading, drainage, and foundation plans and specifications and confirm in writing that they are in conformance with the recommendations provided in their report.

K. At the City's discretion, peer review shall be required for the geotechnical evaluation/investigation report submitted for the development and/or lot plans. The peer reviewer shall be selected by the City. The applicant's geotechnical engineer shall respond to written comments provided by the City's peer reviewer prior to issuance of building permit.

L. The review authority shall determine whether the proposed methods of rendering a known or potential hazard site safe for construction, including proposed geotechnical remediation methods, are feasible and adequate to prevent landslides or damage to property and safety. The review authority shall consult with the City's geotechnical engineer in making this determination. Costs for such consultation shall be paid by the applicant. The review authority may allow development in a known or potential hazard area as provided in this chapter if specific findings are made that the specific provisions in the design of the proposed development will prevent landslides or damage. The review authority may impose any conditions, including limits on type or intensity of land use, which it determines are necessary to assure that landslides or property damage will not occur.

17.44.070 Access to Property.

A. Shared private driveways may be required if the city engineer or principal planner determines that their use will result in safer location of the driveway and lesser amounts of land coverage than would result if separate private driveways are used.
B. Innovations in driveway design and road construction shall be permitted in order to keep grading and cuts or fills to a minimum and to achieve the purpose and policy of this chapter.
C. Points of access to arterials and collectors shall be minimized.
D. The city engineer or principal planner shall verify that adequate emergency services can be provided to the site.

17.44.080 Utilities.

All new service utilities, both on-site and off-site, shall be placed underground and under roadbeds where practicable. Every effort shall be made to minimize the impact of utility construction. Underground utilities require the geologic hazards permitting and review prescribed herein.

17.44.090 Stormwater Drainage.

The applicant shall submit a permanent and complete stormwater control plan. The program shall include, but not be limited to the following items as appropriate: curbs, gutters, inlets, catch basins, detention facilities and stabilized outfalls. Detention facilities shall be designed to City standards as set out in the City's drainage master plan and design standards. The review authority may impose conditions to ensure that waters are drained from the development so as to limit degradation of water quality consistent with Oregon City's Title III section of the Oregon City Municipal Code Chapter 17.49 and the Oregon City Public Works Stormwater Management Design Manual and Standards Plan or other adopted standards subsequently adopted by the City Commission. Drainage design shall be approved by the city engineer before construction, including grading or other soil disturbance, has begun.

17.44.100 Construction Standards.

During construction on land subject to this chapter, the following standards shall be implemented by the developer:
A. All development activity shall minimize vegetation removal and soil disturbance and shall provide positive erosion prevention measures in conformance with OCMC Chapter 17.47 – Erosion and Sediment Control.
B. No grading, clearing or excavation of any land shall be initiated prior to approval of the grading plan, except that the city engineer shall authorize the site access, brush to be cleared and the location of the test pit digging prior to approval of such plan to the extent needed to complete preliminary and final engineering and surveying. The grading plan shall be approved by the city engineer as part of the city's review under this chapter. The developer shall be responsible for the proper execution of the approved grading plan.
C. Measures shall be taken to protect against landslides, mudflows, soil slump and erosion. Such measures shall include sediment fences, straw bales, erosion blankets, temporary sedimentation ponds, interceptor dikes and swales, undisturbed buffers, grooving and stair stepping, check dams, etc. The applicant shall comply with the measures described in the Oregon City Public Works Standards for Erosion and Sedimentation Control (Ordinance 99-1013).
D. All disturbed vegetation shall be replanted with suitable vegetation upon completion of the grading of the steep slope area.

E. Existing vegetative cover shall be maintained to the maximum extent practicable. No grading, compaction or change in ground elevation, soil hydrology and/or site drainage shall be permitted within the drip line of trees designated for protection, unless approved by the City.
F. Existing perennial and intermittent watercourses shall not be disturbed unless specifically authorized by the review authority. This includes physical impacts to the stream course as well as siltation and erosion impacts.
G. All soil erosion and sediment control measures shall be maintained during construction and for one year after development is completed, or until soils are stabilized by revegetation or other measures to the satisfaction of the city engineer. Such maintenance shall be the responsibility of the developer. If erosion or sediment control measures are not being properly maintained or are not functioning properly due to faulty installation or neglect, the City may order work to be stopped. (Ord. 03-1014, Att. B3 (part), 2003: Ord. 94-1001 §2(part), 1994)
H. All newly created lots, either by subdivision or partition, shall contain building envelopes with a slope of 35% or less.
I. The applicant's geotechnical engineer shall provide special inspection during construction to confirm that the subsurface conditions and assumptions made as part of their geotechnical evaluation/investigation are appropriate. This will allow for timely design changes if site conditions are encountered that are different from those anticipated.
J. Prior to issuing an occupancy permit, the geotechnical engineer shall prepare a summary letter stating that the soils- and foundation-related project elements were accomplished in substantial conformance with their recommendations.

17.44.110 Approval of Development.

The city engineer shall review the application and verify, based on the applicant's materials and the land use record, whether the proposed development constitutes a hazard to life, property, natural resources or public facilities. If, in the city engineer's opinion, a particular development poses such a hazard, the city engineer shall recommend to the review authority permit conditions designed to reduce or eliminate the hazard. These conditions may include, but are not limited to, prohibitions on construction activities between November 1st and March 31st.

17.44.120 Liability.

Approval of an application for development on land subject to this chapter shall not imply any liability on the part of the city for any subsequent damage due to earth slides. Prior to the issuance of a building permit, a waiver of damages and an indemnity and hold harmless agreement shall be required which releases the City from all liability for any damages resulting from the development approved by the City's decision.

17.44.130 Compliance.

Nothing contained in this chapter shall relieve the developer of the duty to comply with any other provision of law. In the case of a conflict, the more restrictive regulation shall apply.

17.44.140 Appeal.

The review authority's decision may be appealed in the manner set forth in Chapter 17.50.

Oregon City Municipal Code

Chapter 17.49 - Natural Resource Overlay District

17.49.010 Purpose

The Natural Resource Overlay District designation provides a framework for protection of Metro Titles 3 and 13 lands, and Statewide Planning Goal 5 resources within Oregon City. The Natural Resource Overlay District (NROD) implements the Oregon City Comprehensive Plan Natural Resource Goals and Policies, as well as Federal Clean Water Act requirements for shading of streams and reduction of water temperatures, and the recommendations of the Metro ESEE Analysis. It is intended to resolve conflicts between development and conservation of habitat, stream corridors, wetlands, and floodplains identified in the City's maps. The NROD contributes to the following functional values:

A. Protect and restore streams and riparian areas for their ecologic functions and as an open space amenity for the community.
B. Protect floodplains and wetlands, and restore them for improved hydrology, flood protection, aquifer recharge, and habitat functions.
C. Protect upland habitats, and enhance connections between upland and riparian habitat.
D. Maintain and enhance water quality and control erosion and sedimentation through the revegetation of disturbed sites and by placing limits on construction, impervious surfaces, and pollutant discharges.
E. Conserve scenic, recreational, and educational values of significant natural resources.

The NROD ecological functions listed above are planned for integration with existing neighborhoods and new residential and commercial developments. The long-term goal of the NROD is to restore and enhance stream corridors, wetlands, and forests to more natural vegetated conditions, recognizing that existing homes and other existing uses will continue in the district. This chapter does not regulate the development within the identified water resource. Separate permits from the Division of State Lands and the Army Corp of Engineers may be required for work within a stream or wetland.

17.49.020 NROD Identifying Documents

A. The NROD protects as one connected system the habitats and associated functions of the streams, riparian corridors, wetlands and the regulated upland habitats found in Oregon City. These habitats and functions are described in the following documents upon which the NROD is based:
   1. The 1999 Oregon City Local Wetland Inventory
   2. The Oregon City Water Quality Resource Area Map (Ord. 99-1013)
   3. 2004 Oregon City slope data and mapping (LIDAR)
   4. Metro Regionally Significant Habitat Map (Aerial Photos taken 2002)
   5. National Wetland Inventory (published 1992).
   7. Beavercreek Road Concept Plan (adopted September 2008).
   8. Park Place Concept Plan (adopted April 2008).

The NROD provisions apply only to properties within the NROD as shown on the NROD Map, as amended.

The intent of these regulations is to provide applicants the ability to choose a clear and objective review process or a discretionary review process. The NROD provisions do not affect existing uses and development, or the normal maintenance of existing structures, driveways/parking areas, public

facilities, farmland and landscaped areas. New public facilities such as recreation trails, planned road and utility line crossings and stormwater facilities, are allowed within the overlay district under prescribed conditions as described in Section 17.49.090. In addition, provisions to allow a limited portion of the NROD to be developed on existing lots of record that are entirely or mostly covered by the NROD ("highly constrained") are described in Section 17.49.120.

17.49.030 Map as Reference
This chapter applies to all development within the Natural Resources Overlay District as shown on the NROD Map, which is a regulatory boundary mapped 10' beyond the required vegetated corridor width specified in section 17.49.110. The mapped NROD boundary is based on a GIS-supported application of the adopted documents, plans and maps listed in 17.49.020(A)(1)-(8), however the adopted map may not indicate the true location of protected features. Notwithstanding changing field conditions or updated mapping approved by the City (and processed as a Type I Verification per OCMC 17.49.255), the applicant may choose to either accept the adopted NROD boundary or provide a verifiable delineation of the true location of the natural resource feature pursuant to the Type I or Type II procedure in accordance with this Chapter. The NROD boundary shall be shown on all development permit applications and its location shall be verified in the field before development activity (including grading) commences. The official NROD map can only be amended by the City Commission. Verification of the map shall be processed pursuant to Section 17.49.250.

17.49.035 Addition of Wetlands to Map following Adoption
The NROD boundary shall be expanded to include a wetland identified during the course of a development permit review if it is within or partially within the mapped NROD boundary and meets the State of Oregon's definition of a "Locally Significant Wetland". In such cases the entire wetland and its required vegetated corridor as defined in Table 17.49.110 shall be regulated pursuant to the standards of this Chapter. The NROD boundary shall be added to the NROD map by the Community Development Director after the development permit becomes final.

17.49.040 NROD Permit
An NROD permit is required for those uses regulated under Section 17.49.90, Uses Allowed under Prescribed Conditions. An NROD permit shall be processed under the Type II development permit procedure, unless an adjustment of standards pursuant to Section 17.49.200 is requested or the application is being processed in conjunction with a concurrent application or action requiring a Type III or Type IV development permit. Applications for development on properties affected by the NROD shall delineate or verify the exact location of the NROD as part of a Type I or II development review process unless exempted pursuant to section 17.40.080.

17.49.050 Emergencies
The provisions of this ordinance do not apply to work necessary to protect, repair, maintain, or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies. After the emergency has passed, any disturbed native vegetation areas shall be replanted with similar vegetation found in the Oregon City Native Plant List pursuant to the mitigation standards of Section 17.49.180. For purposes of this section emergency shall mean any man-made or natural event or circumstance causing or Threatening loss of life, injury to person or property, and includes, but is not limited to fire, explosion, flood, severe weather, drought, earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

17.49.060 Consistency and Relationship to Other Regulations

A. Where the provisions of the NROD are less restrictive or conflict with comparable provisions of the

Oregon City Municipal Code, other City requirements, regional, state or federal law, the provisions that provides the greater protection of the resource shall govern.

B. Compliance with Federal and State Requirements.

a. If the proposed development requires the approval of any other governmental agency, such as the Division of State Lands or the U.S. Army Corps of Engineers, the applicant shall make application for such approval prior to or simultaneously with the submittal of its development application to the City. The planning division shall coordinate City approvals with those of other agencies to the extent necessary and feasible. Any permit issued by the City pursuant to this chapter shall not become valid until other agency approvals have been obtained or those agencies indicate that such approvals are not required.

b. The requirements of this chapter apply only to areas within the NROD and to locally significant wetlands that may be added to the boundary during the course of development review pursuant to Section 17.49.035. If, in the course of a development review, evidence suggests that a property outside the NROD may contain a wetland or other protected water resource, the provisions of this chapter shall not be applied to that development review. However, the omission shall not excuse the applicant from satisfying any state and federal wetland requirements which are otherwise applicable. Those requirements apply in addition to, and apart from the requirements of the City's comprehensive plan and this code.

Prohibited, Exempted and Regulated Uses

17.49.070 Prohibited Uses

The following development and activities are not allowed within the NROD:

A. Any new gardens, lawns, structures, development, other than those allowed outright (exempted) by the NROD or that is part of a regulated use that is approved under prescribed conditions. Note: Gardens and lawns within the NROD that existed prior to the time the overlay district was applied to a subject property are allowed to continue but cannot expand further into the overlay district.

B. New lots that would have their buildable areas for new development within the NROD are prohibited.

C. The dumping of materials of any kind is prohibited except for placement of fill as provided in (D) below. The outside storage of materials of any kind is prohibited unless they existed before the overlay district was applied to a subject property. Uncontained areas of hazardous materials as defined by the Oregon Department of Environmental Quality (ORS 466.005) are also prohibited.

D. Grading, the placement of fill in amounts greater than ten cubic yards, or any other activity that results in the removal of more than ten percent of the existing native vegetation on any lot within the NROD is prohibited, unless part of an approved development activity.

17.49.080 Uses Allowed Outright (Exempted)

The following uses are allowed within the NROD and do not require the issuance of an NROD permit:

A. Stream, wetland, riparian, and upland restoration or enhancement projects as authorized by the City.

B. Farming practices as defined in ORS 215.203 and farm uses, excluding buildings and structures, as defined in ORS 215.203.

C. Utility service using a single utility pole or where no more than 100 square feet of ground surface is

disturbed outside of the top-of-bank of water bodies and where the disturbed area is restored to the pre-construction conditions.

D. Boundary and topographic surveys leaving no cut scars greater than three inches in diameter on live parts of native plants listed in the Oregon City Native Plant List.

E. Soil tests, borings, test pits, monitor well installations, and other minor excavations necessary for geotechnical, geological or environmental investigation, provided that disturbed areas are restored to pre-existing conditions as approved by the Community Development Director.

F. Trails meeting all of the following:

1. Construction shall take place between May 1 and October 30 with hand held equipment;
2. Widths shall not exceed 48 inches and trail grade shall not exceed 20 percent;
3. Construction shall leave no scars greater than three inches in diameter on live parts of native plants;
4. Located no closer than 25 feet to a wetland or the top of banks of a perennial stream or 10 feet of an intermittent stream;
5. No impervious surfaces; and
6. No native trees greater than one (1) inch in diameter may be removed or cut, unless replaced with an equal number of native trees of at least 2-inch diameter and planted within 10 feet of the trail.

G. Land divisions provided they meet the following standards, and indicate the following on the final plat:

1. Lots shall have their building sites (or buildable areas) entirely located at least 5 feet from the NROD boundary shown on the City's adopted NROD map. For the purpose of this subparagraph, "building site" means an area of at least 3,500 square feet with minimum dimensions of 40 feet wide by 40 feet deep;
2. All public and private utilities (including water lines, sewer lines or drain fields, and stormwater disposal facilities) are located outside the NROD;
3. Streets, driveways and parking areas where all pavement shall be located at least 10 feet from the NROD; and
4. The NROD portions of all lots are protected by:
   a. A conservation easement; or
   b A lot or tract created and dedicated solely for unimproved open space or conservation purposes.

H. Site Plan and Design Review applications where all new construction is located outside of the NROD boundary shown on the City's adopted NROD map, and the NROD area is protected by a conservation easement approved in form by the City.

I. Routine repair and maintenance of existing structures, roadways, driveways and utilities.

J. Replacement, additions, alterations and rehabilitation of existing structures, roadways, utilities, etc., where the ground level impervious surface area is not increased.

K. Measures mandated by the City of Oregon City to remove or abate nuisances or hazardous conditions.

L. Planting of native vegetation and the removal of non-native, invasive vegetation (as identified on the Oregon City Native Plant List), and removal of refuse and fill, provided that:

1. All work is done using hand-held equipment;
2. No existing native vegetation is disturbed or removed; and
3. All work occurs outside of wetlands and the top-of-bank of streams.

17.49.090 Uses Allowed Under Prescribed Conditions

The following uses within the NROD are subject to the applicable standards listed in Sections 17.49.100 through 17.49.190 pursuant to a Type II process:

A. Alteration to existing structures within the NROD when not exempted by Section 17.49.080, subject

to Section 17.49.130.

B. A residence on a highly constrained vacant lot of record that has less than 3,000 square feet of buildable area, with minimum dimensions of 50 feet by 50 feet, remaining outside the NROD portion of the property, subject to the maximum disturbance allowance prescribed in subsection 17.49.120.A.

C. A land division that would create a new lot for an existing residence currently within the NROD, subject to Section 17.49.160.

D. Land divisions when not exempted by Section 17.49.080, subject to the applicable standards of Section 17.49.160.

E. Trails/pedestrian paths when not exempted by Section 17.49.080, subject to Section 17.49.170 (for trails) or Section 17.49.150 (for paved pedestrian paths).

F. New roadways, bridges/creek crossings, utilities or alterations to such facilities when not exempted by Section 17.49.080,

G. Roads, bridges/creek crossings Subject to Section 17.49.150 --

H. Utility lines subject toSection 17.49.140 (

I. Stormwater detention or pre-treatment facilities subject to Section 17.49.155 ().

J. Institutional, Industrial or Commercial development on a vacant lot of record situated in an area designated for such use that has more than 75% of its area covered by the NROD, subject to subsection 17.49.120(B).

K City, county and state capital improvement projects, including sanitary sewer, water and storm water facilities, water stations, and parks and recreation projects.

17.49.100 General Development Standards

The following standards apply to all Uses Allowed under Prescribed Conditions within the NROD with the exception of rights of ways (subject to Section 17.49.150), trails (subject to Section 17.49.170), utility lines (subject to Section 17.49.140), land divisions (subject to Section 17.49.160), and mitigation projects (subject to Section 17.49.180 or 17.49.190):

A. Native trees may be removed only if they occur within 10 feet of any proposed structures or within 5 feet of new driveways or if deemed not wind-safe by a certified arborist. Trees listed on the Oregon City Nuisance Plant List or Prohibited Plant List are exempt from this standard and may be removed. A protective covenant shall be required for any native trees that remain;

B. The Community Development Director may allow the landscaping requirements of the base zone, other than landscaping required for parking lots, to be met by preserving, restoring and permanently protecting habitat on development sites in the Natural Resource Overlay District.

C. All vegetation planted in the NROD shall be native and listed on the Oregon City Native Plant List;

D. Grading is subject to installation of erosion control measures required by the City of Oregon;

E. The minimum front, street, or garage setbacks of the base zone may be reduced to any distance between the base zone minimum and zero in order to minimize the disturbance area within the NROD portion of the lot;

F. Any maximum required setback in any zone, such as for multi-family, commercial or institutional development, may be increased to any distance between the maximum and the distance necessary to minimize the disturbance area within the NROD portion of the lot;

G. Fences are allowed only within the disturbance area;

H. Incandescent lights exceeding 200 watts (or other light types exceeding the brightness of a 200 watt incandescent light) shall be placed or shielded so that they do not shine directly into resource areas;

I. If development will occur within the 100 yr. floodplain, the FEMA floodplain standards of Chapter 17.42 shall be met; and

J. Mitigation of impacts to the regulated buffer is required, subject to Section 17.49.180 or 17.49.190.

17.49.110 Width of Vegetated Corridor

A. Calculation of Vegetated Corridor Width within City Limits. The NROD consists of a vegetated corridor measured from the top of bank or edge of a protected habitat or water feature. The minimum required width is the amount of buffer required on each side of a stream, or on all sides of a feature if non-linear. The width of the vegetated corridor necessary to adequately protect the habitat or water feature is specified in Table 17.49.110.

Table 17.49.110

Protected Water Feature Type (see definitions)	Slope Adjacent to Protected Water Feature	Starting Point for Measurements from Water Feature	Width of Vegetated Corridor (see Note 1)
Anadromous fish-bearing streams	Any slope	• Edge of bankfull flow	200 feet
Intermittent streams with slopes less than 25 percent and which drain less than 100 acres	< 25 percent	• Edge of bankfull flow	15 feet
All other protected water features	< 25 percent	• Edge of bankfull flow • Delineated edge of Title 3 wetland	50 feet
	≥ 25 percent for 150 feet or more (see Note 2)		200 feet
	≥ 25 percent for less than 150 feet (see Note 2)		Distance from starting point of measurement to top of ravine (break in ≥25 percent slope) (See Note 3) plus 50 feet.

Notes:

1. Required width (measured horizontally) of vegetated corridor unless reduced pursuant to the provisions of Section 17.49.050(I).
2. Vegetated corridors in excess of fifty feet apply on steep slopes only in the uphill direction

from the protected water feature.

3. Where the protected water feature is confined by a ravine or gully, the top of the ravine is the break in the ≥ 25 percent slope.

B. Habitat Areas within City Parks. For habitat and water features identified by Metro as regionally significant which are located within city parks, the NROD Boundary shall correspond to the Metro Regionally Significant Habitat Map.

C. Habitat Areas outside city limit / within UGB. For habitat and water features identified by Metro as regionally significant which are located outside of the city limits as of the date of adoption of this ordinance, the minimum corridor width from any non-anadramous fish bearing stream or wetland shall be fifty feet (50').

17.49.120 Maximum Disturbance Allowance for Highly Constrained Lots of Record

In addition to the General Development Standards of Section 17.49.100, the following standards apply to a vacant lot of record that is highly constrained by the NROD, per subsections 17.49.90(B) and 17.49.90(F):

A. Standard for Residential Development. In the NROD where the underlying zone district is zoned Residential (R-10, R-8, R-6, R-5, R-3.5): the maximum disturbance area allowed for new residential development within the NROD area of the lot is 3,000 square feet.

B. Standard for all developments not located in R-10, R-8, R-6, R-5, and R-3.5. For all other underlying zone districts, including R-2 multifamily, the maximum disturbance area allowed for a vacant, constrained lot of record development within the NROD is that square footage which when added to the square footage of the lot lying outside the NROD portion equals 25% of the total lot area.

[1] Lots that are entirely covered by the NROD will be allowed to develop 25% of their area.

[1] Note: This can be determined by (1) Multiplying the total square footage of the lot by .25; (2) Subtracting from that amount the square footage of the lot that is located outside the NROD; (3) The result is the maximum square footage of disturbance to be allowed in the NROD portion of the lot. If the result is < or = to 0, no disturbance is permitted and the building shall be located outside of the boundary.

C. In all areas of Oregon City, the disturbance area of a vacant, highly constrained lot of record within the NROD shall be set back at least 50 feet from the top of bank on Abernethy Creek, Newell Creek, or Livesay Creek or 25 feet from the top of bank of any tributary of the afore-mentioned Creeks, other water body, or from the delineated edge of a wetland located within the NROD area.

D. If the highly constrained lot of record cannot comply with the above standards, a maximum 1500 square foot disturbance within the NROD area may be allowed

17.49.130 Existing Development Standards

In addition to the General Development Standards of Section 17.49.100, the following standards apply to alterations and additions to existing development within the NROD, except for trails, rights of way, utility lines, land divisions and mitigation projects. Replacement, additions, alterations and rehabilitation of existing structures, roadways, utilities, etc., where the ground level impervious surface area is not increased are exempt from review pursuant to Section 17.49.080(J). As of June 1, 2010, applicants for alterations and additions to existing development that are not exempt pursuant to Section 17.49.080(J) shall submit a Type II or Type III application pursuant to this section. The application

shall include a site plan which delineates a permanent disturbance area that includes all existing buildings, parking and loading areas, paved or graveled areas, patios and decks. The same delineated disturbance area shall be shown on every subsequent proposal for alterations and additions meeting this standard.

A. The following alterations and additions to existing development are permitted subject to the following standards.

1. Alterations or additions that cumulatively total up to a maximum of five-hundred (500) square feet of additional disturbance area after June 1, 2010 shall be processed as a Type II permit pursuant to this Chapter. The new disturbance area shall not encroach closer than 1/2 of the distance of the regulated NROD buffer.

2. Alterations or additions that cumulatively exceed five-hundred (500) square feet of additional disturbance area or which propose encroachment closer than 1/2 of the distance of the regulated NROD buffer after June 1, 2010 shall be processed as a Type III permit pursuant to Section 17.49.200, Adjustment from Standards.

B. Mitigation is required, subject to Section 17.49.180 or 17.49.190.

17.49.140 Standards for Utility Lines

The following standards apply to new utilities, private connections to existing or new utility lines, and upgrades of existing utility lines within the NROD:

A. The disturbance area for private connections to utility lines shall be no greater than 10 feet wide;
B. The disturbance area for the upgrade of existing utility lines shall be no greater than 15 feet wide;
C. New utility lines shall be within the right-of-way, unless reviewed under D.
.D. New utility lines that cross above or underneath a drainage way, wetland, stream, or ravine within the NROD but outside of a right-of-way shall be processed as a Type III permit pursuant to Section 17.49.200, Adjustment from Standards.
E. No fill or excavation is allowed within the ordinary high water mark of a stream without the approval of the Division of State Lands and/or the U.S. Army Corps of Engineers;
F. The Division of State Lands must approve any work that requires excavation or fill in a wetland;
G. Native trees more than 10 inches in diameter shall not be removed unless it is shown that there are no feasible alternatives; and
H. Each 6 to 10-inch diameter native tree cut shall be replaced at a ratio of three trees for each one removed. Each 11-inch or greater diameter native tree shall be replaced at a ratio of five trees for each removed. The replacement trees shall be a minimum one-half inch diameter and selected from the Oregon City Native Plant List. All trees shall be planted on the applicant's site. Where a utility line is approximately parallel with the stream channel, at least half of the replacement trees shall be planted between the utility line and the stream channel.
I. Mitigation is required, subject to Section 17.49.180 or 17.49.190.

17.49.150 Standards for Vehicular or Pedestrian Paths and Roads s

The following standards apply to public rights-of-way and private roads within the NROD, including roads, bridges/stream crossings, driveways and pedestrian paths with impervious surfaces:

A. Stream crossings shall be limited to the minimum number and width necessary to ensure safe and convenient pedestrian, bicycle and vehicle connectivity, and shall cross the stream at an angle as close to perpendicular to the stream channel as practicable. Bridges shall be used instead of culverts wherever practicable.

B. Where the right-of-way or private road crosses a stream the crossing shall be by bridge or a bottomless culvert;
C. No fill or excavation shall occur within the ordinary high water mark of a stream without the approval of the Division of State Lands and/or the U.S. Army Corps of Engineers;
D. If the Oregon Department of State Lands (DSL) has jurisdiction over any work that requires excavation or fill in a wetland, required permits or authorization shall be obtained from DSL prior to release of a grading permit;
E. Any work that will take place within the banks of a stream shall be conducted between June 1 and August 31, or shall be approved by the Oregon Department of Fish and Wildlife; and
F. Mitigation is required, subject to Section 17.49.180 or 17.49.190.

17.49.155 Standards for Stormwater Facilities

Approved facilities that infiltrate stormwater on-site in accordance with Public Works Low-Impact Development standards, including but not limited to; vegetated swales, rain gardens, vegetated filter strips, and vegetated infiltration basins, and their associated piping, may be placed within the NROD boundary pursuant to the following standards:
A. The forest canopy within the driplines of existing trees shall not be disturbed.
B. Only vegetation from the Oregon City Native Plant List shall be planted within these facilities.
C. Mitigation is required, subject to Section 17.49.180 or 17.49.190.
D. The storm water facility may encroach up to1/2 the distance of the NROD corridor
E. The stormwater facility shall not impact more than 1,000 square feet of the NROD. Impacts greater than 1,000 square feet shall be process as a Type III application.
F.. The Community Development Director may allow landscaping requirements of the base zone, other than landscaping required for parking lots, to be met by preserving, restoring and permanently protecting habitat on development sites within the Natural Resource Overlay District.

17.49.160 Standards for Land Divisions

Other than those land divisions exempted by Section 17.49.070 (G), new residential lots created within the NROD shall conform to the following standards.

A. For a lot for an existing residence currently within the NROD. This type of lot is allowed within the NROD for a residence that existed before the NROD was applied to a subject property. A new lot for an existing house may be created through a partition or subdivision process when all of the following are met:
1. There is an existing house on the site that is entirely within the NROD area; and
2. The existing house will remain; and
3. The new lot is no larger than required to contain the house, minimum required side setbacks, garage, driveway and a 20-foot deep rear yard, with the remaining NROD area beyond that point protected by a conservation easement, or by dedicating a conservation tract or public open space.

B. Subdivisions.
1. Prior to preliminary plat approval, the NROD area shall be shown either as a separate tract or part of a larger tract that meets the requirements of subsection (3) of this section, which shall not be a part of any parcel used for construction of a dwelling unit.
2. Prior to final plat approval, ownership of the NROD tract shall be identified to distinguish it from lots intended for sale. The tract may be identified as any one of the following:
   a. Private open space held by the owner or a homeowners association; or
   b. For residential land divisions, private open space subject to an easement conveying stormwater

and surface water management rights to the city and preventing the owner of the tract from activities and uses inconsistent with the purpose of this document; or

c. At the owners option, public open space where the tract has been dedicated to the city or other governmental unit; or

d. Any other ownership proposed by the owner and approved by the city.

e. Tracts shall be exempt from minimum frontage requirements.

C. Partitions

1. New partitions shall delineate the NROD area either as a separate tract or conservation easement that meets the requirements of subsection (2) of this section.
2. Prior to final plat approval, ownership and maintenance of the NROD area shall be identified to distinguish it from the buildable areas of the development site. The NROD area may be identified as any one of the following:
   a. A tract of private open space held by the owner or homeowners association; or
   b. For residential land divisions, a tract of private open space subject to an easement conveying stormwater and surface water management rights to the city and preventing the owner of the tract from activities and uses inconsistent with the purpose of this document; or
   c. At the owners option, public open space where the tract has been dedicated to the city or other governmental unit;
   d. Conservation easement area pursuant to subsection 17.49.180(G) and approved in form by the Community Development Director
   e. Any other ownership proposed by the owner and approved by the Community Development Director.
   f. Tracts shall be exempt from minimum frontage requirements.

17.49.170 Standards for Trails

The following standards apply to trails within the NROD:

A. All trails that are not exempt pursuant to Section 17.49.80(F), , except as designated in the Oregon City Parks, Open Space and Trails Master Plans; and

B. Mitigation is required, subject to Section 17.49.180 or 17.49.190.

17.49.180 Mitigation Standards

The following standards (or the alternative standards of Section 17.49.190) apply to required mitigation:

A. Mitigation shall occur at a 2:1 ratio of mitigation area to proposed NROD disturbance area. Mitigation of the removal or encroachment of a wetland or stream shall not be part of this chapter and will be reviewed by the Division of State Lands or the Army Corp of Engineers during a separate review process;

B. Mitigation shall occur on the site where the disturbance occurs, except as follows:
   1. The mitigation is required for disturbance associated with a right-of-way or utility in the right-of-way;
   2. The mitigation shall occur first on the same stream tributary, secondly in the Abernethy, Newell or Livesay Creek or a tributary thereof, or thirdly as close to the impact area as possible within the NROD; and
   3. An easement that allows access to the mitigation site for monitoring and maintenance shall be

provided as part of the mitigation plan.

C. Mitigation shall occur within the NROD area of a site unless it is demonstrated that this is not feasible because of a lack of available and appropriate area. In such cases, the proposed mitigation area shall be contiguous to the existing NROD area so the NROD boundary can be easily extended in the future to include the new resource site.

D. Invasive and nuisance vegetation shall be removed within the mitigation area;

E. Required Mitigation Planting. An applicant shall meet Mitigation Planting Option 1 or 2 below, whichever option results in more tree plantings, except that where the disturbance area is one acre or more, Mitigation Option 2 shall be required. All trees, shrubs and ground cover shall be selected from the Oregon City Native Plant List.

NOTE: Applications on sites where no trees are present or which are predominantly covered with invasive species shall be required to mitigate the site, remove the invasive species and plant trees and native plants pursuant to Option 2.

1. Mitigation Planting Option 1.
   a. Option 1 - Planting Quantity. This option requires mitigation planting based on the number and size of trees that are removed from the site pursuant to Table 17.49.180(E)(1)(a). Conifers shall be replaced with conifers. Bare ground shall be planted or seeded with native grasses and ground cover species.

Table 17.49.180(E)(1)(a) -- Required Planting Option 1

Size of Tree to be Removed (DBH)	**Number of Trees and Shrubs to be Replanted**
6 to 12"	2 trees and 3 shrubs
13 to 18"	3 trees and 6 shrubs
19 to 24"	5 trees and 12 shrubs
25 to 30"	7 trees and 18 shrubs
Over 30"	10 rees and 30 shrubs

   b. Option 1 - Plant Size. Replacement trees shall be at least one-half inch in caliper on average, measured at 6 inches above the ground level for field grown trees or above the soil line for container grown trees. Oak, madrone, ash or alder may be one gallon size. Conifers shall be a minimum of six (6') in height. Shrubs must be in at least 1-gallon container size or the equivalent in ball and burlap, and shall be at least 12 inches in height at the time of planting. All other species shall be a minimum of four-inch pots;
   c. Option 1 - Plant Spacing. Except for the outer edges of mitigation areas, trees and shrubs shall be planted in a non-linear fashion. Plant spacing for new species shall be measured from the driplines of existing trees when present. Trees shall be planted on average between 8 and 12 feet on center, and shrubs shall be planted on average between 4 and 5 feet on center, or clustered in single species groups of no more than four (4) plants, with each cluster planted on average between 8 and 10 feet on center.
   d. Option 1 - Mulching and Irrigation. Mulch new plantings a minimum of three inches in depth and 18 inches in diamters. Water new plantings one inch per week from June 30th to September 15th, for the three years following planting.
   e. Option 1 – Plant Diversity. Shrubs shall consist of at least two (2) different species. If 10 trees or more are planted, no more than one-half of the trees may be of the same genus.

2. Mitigation Planting Option 2.
   a. Option 2 - Planting Quantity. In this option, the mitigation requirement is calculated based on the size of the disturbance area within the NROD. Native trees and shrubs are required to be

planted at a rate of five (5) trees and twenty-five (25) shrubs per every 500 square feet of disturbance area (calculated by dividing the number of square feet of disturbance area by 500, and then multiplying that result times five trees and 25 shrubs, and rounding all fractions to the nearest whole number of trees and shrubs; for example, if there will be 330 square feet of disturbance area, then 330 divided by 500 equals .66, and .66 times five equals 3.3, so three trees must be planted, and .66 times 25 equals 16.5, so 17 shrubs must be planted). Bare ground must be planted or seeded with native grasses or herbs. Non-native sterile wheat grass may also be planted or seeded, in equal or lesser proportion to the native grasses or herbs..

b. Option 2 - Plant Size. Plantings may vary in size dependent on whether they are live cuttings, bare root stock or container stock, however, no initial plantings may be shorter than 12 inches in height.
c. Option 2 - Plant Spacing. Trees shall be planted at average intervals of seven (7) feet on center. Shrubs may be planted in single-species groups of no more than four (4) plants, with clusters planted on average between 8 and 10 feet on center.
d. Option 2 – Mulching and Irrigation shall be applied in the amounts necessary to ensure 80% survival at the end of the required 5-year monitoring period.
e. Option 2 – Plant Diversity. Shrubs shall consist of at least three (3) different species. If 20 trees or more are planted, no more than one-third of the trees may be of the same genus.

An alternative planting plan using native plants may be approved in order to create a new wetland area, if it is part of a wetlands mitigation plan that has been approved by the DSL or the U.S. Army Corps of Engineers (USACE) in conjunction with a wetland joint removal/fill permit application.

F. Monitoring and Maintenance. The mitigation plan shall provide for a 5-year monitoring and maintenance plan with annual reports in a form approved by the Director of Community Development. Monitoring of the mitigation site is the on-going responsibility of the property owner, assign, or designee, who shall submit said annual report to the City's Planning Division, documenting plant survival rates of shrubs and trees on the mitigation site. Photographs shall accompany the report that indicate the progress of the mitigation. A minimum of 80% survival of trees and shrubs of those species planted is required at the end of the 5-year maintenance and monitoring period. Any invasive species shall be removed and plants that die shall be replaced in kind. Bare spots and areas of invasive vegetation larger than ten (10) square feet that remain at the end the 5 year monitoring period shall be replanted or reseeded with native grasses and ground cover species.

G. Covenant or Conservation Easement. Applicant shall record a restrictive covenant or conservation easement, in a form provided by the City, requiring the owners and assigns of properties subject to this section to comply with the applicable mitigation requirements of this section. Said covenant shall run with the land, and permit the City to complete mitigation work in the event of default by the responsible party. Costs borne by the City for such mitigation shall be borne by the owner.

H. Financial Guarantee. A financial guarantee for establishment of the mitigation area, in a form approved by the City, shall be submitted before development within the NROD disturbance area commences. The City will release the guarantee at the end of the five-year monitoring period, or before, upon it's determination that the mitigation plan has been satisfactorily implemented pursuant to this section.

17.49.190 Alternative Mitigation Standards

In lieu of the above mitigation standards of Section 17.49.180, the following standards may be used. Compliance with these standards shall be demonstrated in a mitigation plan report prepared by an environmental professional with experience and academic credentials in one or more natural resource areas such as ecology, wildlife biology, botany, hydrology or forestry. At the applicant's expense, the City may require the report to be reviewed by an environmental consultant.

The report shall document the existing condition of the vegetated corridor as one of the following categories:

Good Existing Corridor:	Combination of trees, shrubs and groundcover are eighty percent present, and there is more than fifty percent tree canopy coverage in the vegetated corridor.
Marginal Existing Vegetated Corridor:	Combination of trees, shrubs and groundcover are eighty percent present, and twenty-five to fifty percent canopy coverage in the vegetated corridor.
Degraded Existing Vegetated Corridor:	Less vegetation and canopy coverage than marginal vegetated corridors, and/or greater than ten percent surface coverage of any non-native species.

B. The proposed mitigation shall occur at a minimum 2:1 ratio of mitigation area to proposed disturbance area;
C. The proposed mitigation shall result in a significant improvement to Good Existing Condition as determined by a qualified environmental professional;
D. There shall be no detrimental impact on resources and functional values in the area designated to be left undisturbed;
E. Where the proposed mitigation includes alteration or replacement of development in a stream channel, wetland, or other water body, there shall be no detrimental impact related to the migration, rearing, feeding or spawning of fish;
F. Mitigation shall occur on the site of the disturbance to the extent practicable. If the proposed mitigation cannot practically occur on the site of the disturbance, then the applicant shall possess a legal instrument, such as an easement, sufficient to carryout and ensure the success of the mitigation.

17.49.200 Adjustment from Standards

If a regulated NROD use cannot meet one or more of the applicable NROD standards then an adjustment may be issued if all of the following criteria are met. Compliance with these criteria shall be demonstrated by the applicant in a written report prepared by an environmental professional with experience and academic credentials in one or more natural resource areas such as ecology, wildlife biology, botany, hydrology or forestry. At the applicant's expense, the City may require the report to be reviewed by an environmental consultant. Such requests shall be processed under the Type III development permit procedure. The applicant shall demonstrate:

A. There are no feasible alternatives for the proposed use or activity to be located outside the NROD area or to be located inside the NROD area and to be designed in a way that will meet all of the applicable NROD development standards;
B. The proposal has fewer adverse impacts on significant resources and resource functions found in the local NROD area than actions that would meet the applicable environmental development standards;
C. The proposed use or activity proposes the minimum intrusion into the NROD area that is necessary to meet development objectives;
D. Fish and wildlife passage will not be impeded;
E. With the exception of the standard(s) subject to the adjustment request, all other applicable NROD standards can be met; and
F. The applicant has proposed adequate mitigation to offset the impact of the adjustment.

Application Requirements

17.49.210 Type II Development Permit Application

Unless otherwise directed by the NROD standards, proposed development within the NROD shall be processed as a Type II development permit application. All applications shall include the items required for a complete application by Sections 17.49.220-230, and Section 17.50.080 of the Oregon City Municipal Code as well as a discussion of how the proposal meets all of the applicable NROD development standards 17.49.100-170.

17.49.220 Required Site Plans

Site plans showing the following required items shall be part of the application:

A. For the entire subject property (NROD and non-NROD areas):
   1. The NROD district boundary. This may be scaled in relation to property lines from the NROD Map;
   2. 100 year floodplain and floodway boundary (if determined by FEMA);
   3. Creeks and other waterbodies;
   4. Any wetlands, with the boundary of the wetland that will be adjacent to the proposed development determined in a wetlands delineation report prepared by a professional wetland specialist and following the Oregon Division of State Lands wetlands delineation procedures;
   5. Topography shown by contour lines of 2 or 1 foot intervals for slopes less than 15% and by 10 foot intervals for slopes 15% or greater;
   6. Existing improvements such as structures or buildings, utility lines, fences, driveways, parking areas, etc.
   7. Extent of the required Vegetated Corridor required by Table 17.49.110.

B. Within the NROD area of the subject property:
   1. The distribution outline of shrubs and ground covers, with a list of most abundant species;
   2. Trees 6 inches or greater in diameter, identified by species. When trees are located in clusters they may be described by the approximate number of trees, the diameter range, and a listing of dominant species;
   3. An outline of the disturbance area that identifies the vegetation that will be removed. All trees to be removed with a diameter of 6 inches or greater shall be specifically identified as to number, trunk diameters and species;
   4. If grading will occur within the NROD, a grading plan showing the proposed alteration of the ground at 2 foot vertical contours in areas of slopes less than 15% and at 5 foot vertical contours of slopes 15% or greater.

C. A construction management plan including:
   1. Location of site access and egress that construction equipment will use;
   2. Equipment and material staging and stockpile areas;
   3. Erosion control measures that conform to City of Oregon City erosion control standards;
   4. Measures to protect trees and other vegetation located outside the disturbance area.

D. A mitigation site plan demonstrating compliance with Section 17.49.180 or 17.49.190, including:
   1. Dams, weirs or other in-water features;
   2. Distribution, species composition, and percent cover of ground covers to be planted or seeded;
   3. Distribution, species composition, size, and spacing of shrubs to be planted;
   4. Location, species and size of each tree to be planted;
   5. Stormwater management features, including retention, infiltration, detention, discharges and outfalls;
   6. Water bodies or wetlands to be created, including depth;

7. Water sources to be used for irrigation of plantings or for a water source for a proposed wetland.

17.49.230 Mitigation Plan Report

A mitigation plan report that accompanies the above mitigation site plan is also required. The report shall be prepared by an environmental professional with experience and academic credentials in one or more natural resource areas such as ecology, wildlife biology, botany, hydrology or forestry. The mitigation plan report shall, at a minimum, discuss:

A. Written responses to each applicable Mitigation Standard 17.49.180 or 17.49.190 indicating how the proposed development complies with the mitigation standards;
B. The resources and functional values to be restored, created, or enhanced through the mitigation plan;
C. Documentation of coordination with appropriate local, regional, state and federal regulatory/resource agencies such as the Oregon Department of State Lands (DSL) and the United States Army Corps of Engineers (USACE);
D. Construction timetables;
E. Monitoring and Maintenance practices pursuant to Section 17.49.230 (F) and a contingency plan for undertaking remedial actions that might be needed to correct unsuccessful mitigation actions during the first 5 years of the mitigation area establishment.

17.49.240 Density Transfer

The NROD allocates urban densities to the non-NROD portions of properties located partially within the NROD, generally resulting in a substantial increase in net development potential.

For lots of record that are located within the NROD, additional density transfer credits are allowed, subject to the following provisions:

A. Density may be transferred from the NROD to non-NROD portions of the same property or of contiguous properties within the same development site;
B. The residential transfer credit shall be as follows: for new residential partitions and subdivisions, 1/3 of the area of the NROD tract or conservation easement area may be added to the net developable area outside of the tract or conservation easement area within the boundary of the development site in order to calculate the allowable number of lots.
C. Permitted Modifications to Residential Dimensional Standards. In order to allow for a transfer of density pursuant to (B) above, the dimensional standards of the base zone may be modified in order minimize disturbance to the NROD. The permissible reductions are specified in Tables 17.49.240(C-D).
D. The applicant shall demonstrate that the minimum lot size of the underlying zone has been met. The area of the NROD in B above that is used to transfer density may be included in the calculation of the average minimum lot size.
E. The applicant may choose to make the adjustments over as many lots as required. For example, the lot reduction could be spread across all the remaining lots in the proposed subdivision or partition or could be applied to only those needed to incorporate the areas of the NROD Tract.

Table 17.49.240 A
Lot Size Reduction

ZONE	Min. Lot Size (%)	Min. Lot Width	Min. Lot Depth
R-10	5,000 sq. feet	50'	65'
R-8	4,000 sq. feet	45'	60'
R-6	3,500 sq. feet	35'	55'
R-5	3,000 sq. feet	30'	50'
R-3.5	1,800 sq. feet	20'	45'

Table 17.49.240 B
Reduced Dimensional Standards for Detached Single-Family Residential Units

Size of Reduced Lot	Front Yard Setback	Rear Yard Setback	Side yard Setback	Corner Side	Lot Coverage
8,000-9,999 square feet	15 feet	20 feet	7/9 feet	15 feet	40%
6,000-7,999 square feet	10 feet	15 feet	5/7 feet	15 feet	40%
4,000-5,999 square feet	10 feet	15 feet	5/5 feet	10 feet	40%
1,800-3,999 square feet	5 feet	15 feet	5/5 feet	10 feet	55%

Table 17.49.240 C
Reduced Dimensional Standards for Single-Family Attached or Two-Family Residential Units

Size of Reduced Lot	Front Yard Setback	Rear Yard Setback	Side yard Setback	Corner Side	Lot Coverage
3,500-7,000 square feet	10 feet	15 feet	5/0* feet	10 feet	40%
1,800-3,499 square feet	5 feet	15 feet	5/0* feet	10 feet	55%

*0 foot setback is only allowed on single-family attached units

F. Transfers for properties zoned Commercial, Institutional, Industrial or Multi-Family uses the transfer credit is 10,000 sq. ft. per acre of land within the NROD;
G. The area of land contained in the NROD area may be excluded from the calculations for determining compliance with minimum density requirements of the land division code.
H. The owner of the transferring property shall execute a covenant with the City that records the transfer of density. The covenant shall be found to meet the requirements of this section and be recorded before building permits are issued; and
I. All other applicable development standards, including setbacks, building heights, and maximum lot coverage shall continue to apply when a density transfer occurs.

17.49.250 Verification of NROD Boundary

The NROD boundary may have to be verified occasionally to determine the true location of a resource and its functional values on a site. This may through a site specific environmental survey or, in those cases where existing information demonstrates that the NROD significance rating does not apply to a site-specific area. Applications for development on a site located in the NROD area may request a determination that the subject site is not in an NROD area and therefore is not subject to the standards

of Section 17.49.100. Verifications shall be processed as either a Type I or Type II process.

17.49.255 Type I Verification.

A. Applicants for a determination under this section shall submit a site plan meeting the requirements of 17.49.220, as applicable.
B. Alternatively, an applicant may request a Type I Verification determination by the Community Development Director by making an application therefore and paying to the City a fee as set by resolution of the City Commission. Such requests may be approved provided that there is evidence substantiating that all the requirements of this chapter relative to the proposed use are satisfied and demonstrates that the property also satisfies the following criteria, as applicable:
   1. No soil, vegetation, hydrologic features have been disturbed;
   2. No hydrologic features have been changed;
   3. There are no man-made drainage features, water marks, swash lines, drift lines present on trees or shrubs, sediment deposits on plants, or any other evidence of sustained inundation.
   4. The property does not contain a wetland as identified by the City's local wetland inventory or water quality and flood management areas map.
   5. There is no evidence of a perennial or intermittent stream system or other protected water feature. This does not include established irrigation ditches currently under active farm use, canals or manmade storm or surface water runoff structures or artificial water collection devices.
   6. Evidence of prior land use approvals that conform to the City's existing Water Quality Resource Area Overlay District.

   There is an existing physical barrier between the site and a protected water feature, including:
   a. streets, driveways, alleys, parking lots or other approved impervious areas wider than 15 feet and which includes drainage improvements that are connected to the City storm sewer system, as approved by the City.
   b. Walls, buildings, drainages, culverts or other structures and which form a physical barrier between the site and the protected water features, as approved by the City.
C. If a the City is not able to clearly determine, through the Type I verification process that the applicable criteria (B)1-6 above are met the verification application shall be denied. An applicant may then opt to apply for an verification through the Type II process defined below.

17.49.260. Type II Verification

Verifications of the NROD which cannot be determined pursuant to the standards of 17.49.255may be processed under the Type II permit procedure.

A. Applicants for a determination under this section shall submit a site plan meeting the requirements of 17.49.220 as applicable.
B. Such requests may be approved provided that there is evidence that demonstrates in an environmental report prepared by one or more qualified professionals with experience and credentials in natural resource areas, including wildlife biology, ecology, hydrology and forestry, that a resource function(s) and/or land feature(s) does not apply to a site-specific area.
C. Verification to remove a recently developed area from the NROD shall show that all of the following have been met:
   1. All approved development in the NROD has been completed;
   2. All mitigation required for the approved development, located within the NROD, has been successful; and
   3. The previously identified resources and functional values on the developed site no longer exist or have been subject to a significant detrimental impact.

17.49.265 Corrections to Violations

For correcting violations, the violator shall submit a remediation plan that meets all of the applicable standards of the NROD. The remediation plan shall be prepared by one or more qualified professionals with experience and credentials in natural resource areas, including wildlife biology, ecology, hydrology and forestry. If one or more of these standards cannot be met then the applicant's remediation plan shall demonstrate that there will be:

A. No permanent loss of any type of resource or functional value listed in section 17.49.10, as determined by a qualified environmental professional;
B. A significant improvement of at least one functional value listed in section 17.49.10, as determined by a qualified environmental professional; and
C. There will be minimal loss of resources and functional values during the remediation action until it is fully established.

Oregon City Municipal Code

Chapter 17.50 Administration and Procedures

17.50.010 Purpose.

This chapter provides the procedures by which Oregon City reviews and decides upon applications for all permits relating to the use of land authorized by ORS Chapters 92, 197 and 227. These permits include all form of land divisions, land use, limited land use and expedited land division and legislative enactments and amendments to the Oregon City comprehensive plan and Titles 16 and 17 of this code. Pursuant to ORS 227.175, any applicant may elect to consolidate applications for two or more related permits needed for a single development project. Any grading activity associated with development shall be subject to preliminary review as part of the review process for the underlying development. It is the express policy of the City that development review not be segmented into discrete parts in a manner that precludes a comprehensive review of the entire development and its cumulative impacts.

17.50.030 Summary of the City's Decision-Making Processes.

The following decision-making processes chart shall control the City's review of the indicated permits:

Table 17.50.030
PERMIT APPROVAL PROCESS

PERMIT TYPE	I	II	III	IV	Expedited Land Division
Compatibility Review	X				
Code Interpretation			X		
General Development Plan			X		
Conditional Use			X		
Detailed Development Plan[1]		X	X		
Extension		X			
Final Plat	X				
Geologic Hazards		X			
Historic Review			X		
Lot Line Adjustment and Abandonment	X				
Major Modification to a Prior Approval[2]	X	X	X	X	X
Minor Modification to a prior Approval	X				
Minor Partition		X			
Nonconforming Use, Structure and Lots Review	X	X			
Reconsideration	X				

[1] If any provision or element of the master plan requires a deferred Type III procedure, the detailed development plan shall be processed through a Type III procedure.

[2] A major modification to a prior approval shall be considered using the same process as would be applicable to the initial approval.

Revocation				X	
Site Plan and Design Review		X			
Subdivision		X			X
Variance		X	X		
Zone Change & Plan Amendment				X	
Zone Change Upon Annexation with No Discretion	X			X	
Zone Change Upon Annexation with Discretion				X	
Natural Resource Exemption	X				
Natural Resource Review		X			

A. Type I decisions do not require interpretation or the exercise of policy or legal judgment in evaluating approval criteria. . Because no discretion is involved, Type I decisions do not qualify as a land use, or limited land use, decision. The decision-making process requires no notice to any party other than the applicant. The Community Development Director's decision is final and not appealable by any party through the normal City land use process.

B. Type II decisions involve the exercise of limited interpretation and discretion in evaluating approval criteria, similar to the limited land use decision-making process under state law. Applications evaluated through this process are assumed to be allowable in the underlying zone, and the inquiry typically focuses on what form the use will take or how it will look. Notice of application and an invitation to comment is mailed to the applicant, recognized active neighborhood association(s) and property owners within three hundred feet. The Community Development Director accepts comments for a minimum of fourteen days and renders a decision. The Community Development Director's decision is appealable to the City Commission with notice to the Planning Commission, by any party with standing (i.e., applicant and any party who submitted comments during the commentperiod). The City Commission decision is the City's final decision and is appealable to the Land Use Board of Appeals (LUBA) within twenty-one days of when it becomes final.

C. Type III decisions involve the greatest amount of discretion and evaluation of subjective approval standards, yet are not required to be heard by the City Commission, except upon appeal. In the event that any decision is not classified, it shall be treated as a Type III decision. The process for these land use decisions is controlled by ORS 197.763. Notice of the application and the Planning Commission or the Historic Review Board hearing is published and mailed to the applicant, recognized neighborhood association(s) and property owners within three hundred feet. Notice must be issued at least twenty days pre-hearing, and the staff report must be available at least seven days pre-hearing. At the evidentiary hearing held before the Planning Commission or the Historic Review Board, all issues are addressed. The decision of the Planning Commission or Historic Review Board is appealable to the City Commission, on the record. The City Commission decision on appeal from the Historic Review Board or the Planning Commission is the City's final decision and is appealable to LUBA within twenty-one days of when it becomes final.

D. Type IV decisions include only quasi-judicial plan amendments and zone changes. These applications involve the greatest amount of discretion and evaluation of subjective approval standards and must be heard by the City Commission for final action. The process for these land use decisions is controlled by ORS 197.763. Notice of the application and Planning Commission hearing is published and mailed to the applicant, recognized neighborhood association(s) and property owners within three hundred feet. Notice must be issued at least twenty days pre-hearing, and the staff report must be available at least seven days pre-hearing. At the evidentiary hearing held before the Planning Commission, all issues are addressed. If the Planning Commission denies the application, any party with standing (i.e.,

anyone who appeared before the Planning Commission either in person or in writing within the comment period) may appeal the Planning Commission denial to the City Commission. If the Planning Commission denies the application and no appeal has been received within ten days of the issuance of the final decision then the action of the Planning Commission becomes the final decision of the City. If the Planning Commission votes to approve the application, that decision is forwarded as a recommendation to the City Commission for final consideration. In either case, any review by the City Commission is on the record and only issues raised before the Planning Commission may be raised before the City Commission. The City Commission decision is the City's final decision and is appealable to the Land Use Board of Appeals (LUBA) within twenty-one days of when it becomes final.

E. The expedited land division (ELD) process is set forth in ORS 197.360 to 197.380. To qualify for this type of process, the development must meet the basic criteria in ORS 197.360(1)(a) or (b). While the decision-making process is controlled by state law, the approval criteria are found in this code. The Community Development Director has twenty-one days within which to determine whether an application is complete. Once deemed complete, the Community Development Director has sixty-three days within which to issue a decision. Notice of application and opportunity to comment is mailed to the applicant, recognized neighborhood association and property owners within one hundred feet of the subject site. The Community Development Director will accept written comments on the application for fourteen days and then issues a decision. State law prohibits a hearing. Any party who submitted comments may call for an appeal of the Community Development Director's decision before a hearings referee. The referee need not hold a hearing; the only requirement is that the determination be based on the evidentiary record established by the Community Development Director and that the process be "fair." The referee applies the city's approval standards, and has forty-two days within which to issue a decision on the appeal. The referee is charged with the general objective to identify means by which the application can satisfy the applicable requirements without reducing density. The referee's decision is appealable only to the court of appeals pursuant to ORS 197.375(8) and 36.355(1).

17.50.040 Development Review in Overlay Districts and for Erosion Control.

For any development subject to regulation of Geologic Hazards under city code Chapter 17.44; Natural Resource under Chapter 17.49; Willamette River Greenway under Chapter 17.48; and erosion control under Chapter 17.47, compliance with the requirements of these chapters shall be reviewed as part of the review process required for the underlying development for the site.

17.50.050 Preapplication Conference

A Preapplication Conference. Prior to submitting an application for any form of permit, the applicant shall schedule and attend a preapplication conference with City staff to discuss the proposal. To schedule a preapplication conference, the applicant shall contact the Planning Division, submit the required materials, and pay the appropriate conference fee. At a minimum, an applicant should submit a short narrative describing the proposal and a proposed site plan, drawn to a scale acceptable to the City, which identifies the proposed land uses, traffic circulation, and public rights-of-way and all other required plans. The purpose of the preapplication conference is to provide an opportunity for staff to provide the applicant with information on the likely impacts, limitations, requirements, approval standards, fees and other information that may affect the proposal. The Planning Division shall provide the applicant(s) with the identity and contact persons for all affected neighborhood associations as well as a written summary of the preapplication conference. Notwithstanding any representations by City staff at a preapplication conference, staff is not authorized to waive any

requirements of this code, and any omission or failure by staff to recite to an applicant all relevant applicable land use requirements shall not constitute a waiver by the City of any standard or requirement.

B. A preapplication conference shall be valid for a period of six months from the date it is held. If no application is filed within six months of the conference or meeting, the applicant must schedule and attend another conference before the City will accept a permit application. The Community Development Director may waive the preapplication requirement if, in the Director's opinion, the development does not warrant this step. In no case shall a preapplication conference be valid for more than one year.

17.50.055 Neighborhood Association Meeting

A. Neighborhood Association Meeting. The purpose of the meeting with the recognized neighborhood association is to inform the affected neighborhood association about the proposed development and to receive the preliminary responses and suggestions from the neighborhood association and the member residents.
   1. Applicants applying for Annexations, Zone Change, Comprehensive Plan Amendments, Conditional Use, Planning Commission Variances, Subdivision, or Site Plan and Design Review (excluding Minor Site Plan and Design Review), General Development Master Plans or Detailed Development Plans applications shall schedule and attend a meeting with the city-recognized neighborhood association in whose territory the application is proposed. Although not required for other projects than those identified above, a meeting with the neighborhood association is highly recommended.
   2. The applicant shall send, by certified mail, return receipt requested letter to the chairperson of the neighborhood association and the Citizen Involvement Committee describing the proposed project. Other communication methods may be used if approved by the Neighborhood Association.
   3. A meeting shall be scheduled within 30 days of the notice. A meeting may be scheduled later than 30 days if by mutual agreement of the applicant and the neighborhood association. If the neighborhood association does not want to, or cannot meet within 30 days, the applicant shall hold their own meeting after 6pm or on the weekend, with notice to the neighborhood association, Citizen Involvement Committee, and all property owners within 300 feet. If the applicant holds their own meeting, a copy of the certified letter requesting a neighborhood association meeting shall be required for a complete application. The meeting held by the applicant shall be held within the boundaries of the neighborhood association or in a City facility.
   4. If the Neighborhood Association is not currently recognized by the city, is inactive, or does not exist, the applicant shall request a meeting with the Citizen Involvement Committee.
   5. To show compliance with this section, the applicant shall submit a sign-in sheet of meeting attendees, a summary of issues discussed, and letter from the Neighborhood Association or Citizen Involvement Committee indicating that a neighborhood meeting was held. If the applicant held a separately noticed meeting, the applicant shall submit a copy of the meeting flyer, a sign in sheet of attendees and a summary of issues discussed.

17.50.060 Application Requirements.

A permit application may only be initiated by the record property owner or contract purchaser, the City Commission or Planning Commission. If there is more than one record owner, then the City will not accept an application without signed authorization from all record owners. All permit applications must

be submitted on the form provided by the City, along with the appropriate fee and all necessary supporting documentation and information, sufficient to demonstrate compliance with all applicable approval criteria. The applicant has the burden of demonstrating, with evidence, that all applicable approval criteria are, or can be, met.

17.50.070 Completeness Review and 120-day Rule.

A. Upon submission, the Community Development Director shall date stamp the application form and verify that the appropriate application fee has been submitted. The Community Development Director will then review the application and all information submitted with it and evaluate whether the application is complete enough to process. Within thirty days of receipt of the application, the Community Development Director shall complete this initial review and issue to the applicant a written statement indicating whether the application is complete enough to process, and if not, what information must be submitted to make the application complete.

B. The applicant has 180 days from the date the application was made to submit the missing information or, on the 181st day, the application shall be rejected and all materials (except one copy of the application) and the unused portion of the application fee returned to the applicant. If the applicant submits the requested information within the 180-day period, the Community Development Director shall again verify whether the application, as augmented, is complete. Each such review and verification shall follow the procedure in subsection A of this section.

   The application will be deemed complete for the purpose of this section upon receipt by the Community Development Division of:

   1.All the missing information;

   2. Some of the missing information and written notice from the applicant that no other information will be provided; or

   3. Written notice from the applicant that none of the missing information will be provided.

C. Once the Community Development Director determines the application is complete enough to process, or the applicant refuses to submit any more information, the City shall declare the application complete. Pursuant to ORS 227.178, the City will reach a final decision on an application within 120 calendar days from the date that the application is determined to be or deemed complete unless the applicant agrees to suspend the 120 calendar day time line or unless State law provides otherwise. The 120-day period, however, does not apply in the following situations:

   1. Any hearing continuance or other process delay requested by the applicant shall be deemed an extension or waiver, as appropriate, of the 120-day period.
   2. Any delay in the decision-making process necessitated because the applicant provided an incomplete set of mailing labels for the record property owners within three hundred feet of the subject property shall extend the 120-day period for the amount of time required to correct the notice defect.
   3. The 120-day period does not apply to any application for a permit that is not wholly within the city's authority and control.
   4. The 120-day period does not apply to any application for an amendment to the City's Comprehensive Plan or land use regulations nor to any application for a permit, the approval of which depends upon a plan amendment.

D. The 120-day period specified in Section 17.50.070.C may be extended for a specified period of time at the written request of the applicant. The total of all extensions may not exceed 245 calendar days..

E. The approval standards that control the City's review and decision on a complete application are those which were in effect on the date the application was first submitted.

17.50.080 Complete Application--Required Information.

Unless stated elsewhere in City code Titles 16 or 17, a complete application includes all the materials listed in this subsection. The Community Development Director may waive the submission of any of these materials if not deemed to be applicable to the specific review sought. Likewise, within thirty days of when the application is first submitted, the Community Development Director may require additional information, beyond that listed in this subsection or elsewhere in Titles 16 or 17, such as a traffic study or other report prepared by an appropriate expert. In any event, the applicant is responsible for the completeness and accuracy of the application and all of the supporting documentation, and the city will not deem the application complete until all information required by the Community Development Director is submitted. At a minimum, the applicant must submit the following:

A. One copy of a completed city application form that includes the following information:
   1. An accurate legal description, tax account number(s), map and location of all properties that are the subject of the application,
   2. Name, address, telephone number and authorization signature of all record property owners or contract owners, and the name, address and telephone number of the applicant, if different from the property owner(s);

B. A complete list of the permit approvals sought by the applicant;

C. A current preliminary title report for the subject property(ies);

D. A complete and detailed narrative description of the proposed development that describes existing site conditions, existing buildings, public facilities and services, presence of wetlands, steep slopes and other natural features, a discussion of the approval criteria for all permits required for approval of the development proposal that explains how the criteria are or can be met, and any other information indicated by staff at the preapplication conference as being required;

E. Up to twenty-one legible copies of all reports, plans, site plans and other documents required by the section of this code corresponding to the specific approval(s) sought;

F. At least one copy of the site plan and all related drawings shall be in a readable/legible eight and one-half by eleven inch format for inclusion into the city's bound record of the application;

G. Mailing labels for notice to all parties entitled under Section 17.50.090 to receive mailed notice of the application. The applicant shall use the names and addresses of property owners within the notice area indicated on the most recent property tax rolls;

H. All required application fees;

I. Annexation agreements (if applicable);

J. Additional documentation as needed by the Community Development Director.

17.50.090 Public Notices.

17.50.090 Public notices.

All public notices issued by the city with regard to a land use matter, announcing applications or public hearings of quasi-judicial or legislative actions, shall comply with the requirements of this section.

A. Notice of Type II Applications. Once the planning manager has deemed a Type II application complete, the city shall prepare and send notice of the application, by first class mail, to all record owners of property within three hundred feet of the subject property and to any city-recognized neighborhood association whose territory includes the subject property. Pursuant to Section 17.50.080(G), the applicant is responsible for providing an accurate and complete set of mailing labels for these property owners and for posting the subject property with the city-prepared notice in accordance with Section 17.50.100. The city's Type II notice shall include the following information:

   1. Street address or other easily understood location of the subject property and city-assigned planning file number;
   2. A description of the applicant's proposal, along with citations of the approval criteria that the city will use to evaluate the proposal;

3. A statement that any interested party may submit to the city written comments on the application during a fourteen-day comment period prior to the city's deciding the application, along with instructions on where to send the comments and the deadline of the fourteen-day comment period;
4. A statement that any issue which is intended to provide a basis for an appeal must be raised in writing during the fourteen-day comment period with sufficient specificity to enable the city to respond to the issue;
5. A statement that the application and all supporting materials may be inspected, and copied at cost, at City Hall during normal business hours;
6. The name and telephone number of the planning staff person assigned to the application or is otherwise available to answer questions about the application.
7. The notice shall state that a city-recognized neighborhood association requesting an appeal fee waiver pursuant to 17.50.290(C) must officially approve the request through a vote of its general membership or board at a duly announced meeting prior to the filing of an appeal.

B. Notice of Public Hearing on a Type III or IV Quasi-Judicial Application. Notice for all public hearings concerning a quasi-judicial application shall conform to the requirements of this subsection. At least twenty days prior to the hearing, the city shall prepare and send, by first class mail, notice of the hearing to all record owners of property within three hundred feet of the subject property and to any city-recognized neighborhood association whose territory includes the subject property. The city shall also publish the notice in a newspaper of general circulation within the city at least twenty days prior to the hearing. Pursuant to Section 17.50.080(H), the applicant is responsible for providing an accurate and complete set of mailing labels for these property owners and for posting the subject property with the city-prepared notice in accordance with Section 17.50.100. Notice of the application hearing shall include the following information:

1. The time, date and location of the public hearing;
2. Street address or other easily understood location of the subject property and city-assigned planning file number;
3. A description of the applicant's proposal, along with a list of citations of the approval criteria that the city will use to evaluate the proposal;
4. A statement that any interested party may testify at the hearing or submit written comments on the proposal at or prior to the hearing and that a staff report will be prepared and made available to the public at least seven days prior to the hearing;
5. A statement that any issue which is intended to provide a basis for an appeal to the city commission must be raised before the close of the public record. Issues must be raised and accompanied by statements or evidence sufficient to afford the city and all parties to respond to the issue;
6. The notice shall state that a city-recognized neighborhood association requesting an appeal fee waiver pursuant to 17.50.290(C) must officially approve the request through a vote of its general membership or board at a duly announced meeting prior to the filing of an appeal.
7. A statement that the application and all supporting materials and evidence submitted in support of the application may be inspected at no charge and that copies may be obtained at reasonable cost at City Hall during normal business hours; and
8. The name and telephone number of the planning staff person responsible for the application or is otherwise available to answer questions about the application.

C. Notice of Public Hearing on a Legislative Proposal. At least twenty days prior to a public hearing at which a legislative proposal to amend or adopt the city's land use regulations or comprehensive plan is to be considered, the planning manager shall issue a public notice that conforms to the requirements of this subsection. Notice shall be sent to affected governmental entities, special districts, providers of urban services, including Tri-Met, Oregon Department of Transportation and Metro, any affected recognized neighborhood associations and any party who has requested in writing such notice. Notice shall also be

published in a newspaper of general circulation within the city. Notice issued under this subsection shall include the following information:

1. The time, date and location of the public hearing;
2. The city-assigned planning file number and title of the proposal;
3. A description of the proposal in sufficient detail for people to determine the nature of the change being proposed;
4. A statement that any interested party may testify at the hearing or submit written comments on the proposal at or prior to the hearing; and
5. The name and telephone number of the planning staff person responsible for the proposal and who interested people may contact for further information.

17.50.100 Notice Posting Requirements.

Where this chapter requires notice of a pending or proposed permit application or hearing to be posted on the subject property, the requirements of this section shall apply.

A. City Guidance and the Applicant's Responsibility. The City shall supply all of the notices which the applicant is required to post on the subject property and shall specify the dates the notices are to be posted and the earliest date on which they may be removed. The City shall also provide a statement to be signed and returned by the applicant certifying that the notice(s) were posted at the correct time and that if there is any delay in the City's land use process caused by the applicant's failure to correctly post the subject property for the required period of time and in the correct location, the applicant agrees to extend the one-hundred-twenty-day period in a timely manner.

B. Number and Location. The applicant must place the notices on each frontage of the subject property. If the property's frontage exceeds six hundred feet, the applicant shall post one copy of the notice for each six hundred feet or fraction thereof. Notices do not have to be posted adjacent to alleys or unconstructed right-of-way. Notices shall be posted within ten feet of the street and shall be visible to pedestrians and motorists. Notices shall not be posted within the public right-of-way or on trees. The applicant shall remove all signs within ten days following the event announced in the notice.

17.50.110 Assignment of Decision-Makers.

The following City entity or official shall decide the following types of applications:

A. Type I Decisions. The Community Development Director shall render all Type I decisions. The Community Development Director's decision is the City's final decision on a Type I application.

B. Type II Decisions. The Community Development Director shall render the City's decision on all Type II permit applications which are appealable to the City Commission with notice to the Planning Commission. The City Commission decision is appealable to LUBA.

C. Type III Decisions. The Planning Commission or Historic Review Board, as applicable, shall render all Type III decisions. Such decision is appealable to the City Commission, on the record. The City Commission's decision is the City's final decision and is appealable to LUBA within twenty-one days of when it becomes final.

D. Type IV Decisions. The Planning Commission shall render the initial decision on all Type IV permit applications. If the Planning Commission denies the Type IV application, that decision is final unless appealed to the City Commission in accordance with Section 17.50.190. If the Planning Commission recommends approval of the application, that recommendation is forwarded to the City Commission. The City Commission decision is the City's final decision on a Type IV application and is appealable to LUBA.

E. ELD. The Community Development Director shall render the initial decision on all ELD applications. The Community Development Director's decision is the City's final decision unless appealed in

accordance to ORS 197.375 to a City-appointed hearings referee. The hearings referee decision is the City's final decision which is appealable to the Oregon Court of Appeals.

17.50.120 Quasi-Judicial Hearing Process.

All public hearings pertaining to quasi-judicial permits, whether before the Planning Commission, Historic Review Board, or City Commission, shall comply with the procedures of this section. In addition, all public hearings held pursuant to this chapter shall comply with the Oregon Public Meetings Law, the applicable provisions of ORS 197.763 and any other applicable law.

A. Once the Community Development Director determines that an application for a Type III or IV decision is complete, the Planning Division shall schedule a hearing before the Planning Commission or Historic Review Board, as applicable. Once the Community Development Director determines that an appeal of a Type II, Type III or Type IV decision has been properly filed under Section 17.50.190, the planning division shall schedule a hearing before the City Commission.
B. Notice of the Type III or IV hearing shall be issued at least twenty days prior to the hearing in accordance with Section 17.50.090(B).
C. Written notice of an appeal hearing before the City Commission shall be sent by regular mail no later than 14 days prior to the date of the hearing to the appellant, the applicant if different from the appellant, the property owner(s) of the subject site, all persons who testified either orally or in writing before the hearing body and all persons that requested in writing to be notified.
D. The Community Development Director shall prepare a staff report on the application which lists the applicable approval criteria, describes the application and the applicant's development proposal, summarizes all relevant city department, agency and public comments, describes all other pertinent facts as they relate to the application and the approval criteria and makes a recommendation as to whether each of the approval criteria are met.
E. At the beginning of the initial public hearing at which any quasi-judicial application or appeal is reviewed, a statement describing the following shall be announced to those in attendance:
    1. That the hearing will proceed in the following general order: staff report, applicant's presentation, testimony in favor of the application, testimony in opposition to the application, rebuttal, record closes, commission deliberation and decision;
    2. That all testimony and evidence submitted, orally or in writing, must be directed toward the applicable approval criteria. If any person believes that other criteria apply in addition to those addressed in the staff report, those criteria must be listed and discussed on the record. The meeting chairperson may reasonably limit oral presentations in length or content depending upon time constraints. Any party may submit written materials of any length while the public record is open;
    3. Failure to raise an issue on the record with sufficient specificity and accompanied by statements or evidence sufficient to afford the city and all parties to respond to the issue, will preclude appeal on that issue to the state land use board of appeals;
    4. Any party wishing a continuance or to keep open the record must make that request while the record is still open; and
    5. That the Commission chair shall call for any ex-parte contacts, conflicts of interest or bias before the beginning of each hearing item.
    6. For appeal hearings, only those persons who participated either orally or in writing in the decision or review will be allowed to participate either orally or in writing on the appeal.
F. Requests for continuance and to keep open the record: The hearing may be continued to allow the submission of additional information or for deliberation without additional information. New notice of a continued hearing need not be given so long as a time-certain and location is established for the continued hearing. Similarly, hearing may be closed but the record kept open for the submission of additional written material or other documents and exhibits. The chairperson may limit the factual and legal issues that may be addressed in any continued hearing or open-record period.

17.50.130 Conditions of Approval and Notice of Decision.

A. All City decision-makers have the authority to impose reasonable conditions of approval designed to ensure that all applicable approval standards are, or can be, met.
B. Failure to comply with any condition of approval shall be grounds for revocation of the permit(s) and grounds for instituting code enforcement proceedings pursuant to Chapter 1.20 of this code and ORS 30.315.
C. Notice of Decision. The City shall send, by first class mail, a notice of all decisions rendered under this chapter to all persons with standing, i.e., the applicant, all others who participated either orally or in writing before the close of the public record and those who specifically requested notice of the decision. The notice of decision shall include the following information:
   1. The file number and date of decision;
   2. The name of the applicant, owner and appellant (if different);
   3. The street address or other easily understood location of the subject property;
   4. A brief summary of the decision, and if an approval, a description of the permit approved;
   5. A statement that the decision is final unless appealed and description of the requirements for perfecting an appeal;
   6. The contact person, address and a telephone number whereby a copy of the final decision may be inspected or copies obtained.
D. Modification of Conditions. Any request to modify a condition of permit approval is to be considered either minor modification or a major modification. A minor modification shall be processed as a Type I. A major modification shall be processed in the same manner and shall be subject to the same standards as was the original application. However, the decision-maker may at their sole discretion, consider a modification request and limit its review of the approval criteria to those issues or aspects of the application that are proposed to be changed from what was originally approved.

17.50.140 Performance Guarantees.

When conditions of permit approval require a permitee to construct certain improvements, the city may, in its discretion, allow the permitee to submit a performance guarantee in lieu of actual construction of the improvement. Performance guarantees shall be governed by this section.

A. Form of Guarantee. Performance Guarantees shall be in a form approved by the city attorney Approvable methods of performance guarantee include irrevocable standby letters of credit to the benefit of the city issued by a recognized lending institution, certified checks, dedicated bank accounts or allocations of construction loans held in reserve by the lending institution for the benefit of the city. The form of guarantee shall be specified by the City Engineer and, prior to execution and acceptance by the city shall be reviewed and approved by the City Attorney. The guarantee shall be filed with the City Engineer.
B. Timing of Gurantee. A permittee shall be required to provide a performance guarantee as follows.
   1. After Final Approved Design By The City: A permitee may request the option of submitting a performance guarantee when prepared for temporary/final occupancy. The guarantee shall be one hundred twenty percent of the estimated cost of constructing the remaining public improvements as submitted by the permittee's engineer. The engineer's estimated costs shall be supported by a verified engineering estimate and approved by the City Engineer.
   2. Before Complete Design Approval And Established Engineered Cost Estimate: A permitee may request the option of submitting a performance guarantee before public improvements are designed and completed. The guarantee shall be one hundred fifty percent of the estimated cost of constructing the public improvements as submitted by the permittee's engineer and approved by the City Engineer. The engineer's estimated costs shall be supported by a verified engineering estimate and approved by the City Engineer. This scenario applies for a fee-in-lieu situation to

ensure adequate funds for the future work involved in design, bid, contracting, and construction management and contract closeout. In this case, the fee-in-lieu must be submitted as cash, certified check, or other negotiable instrument as approved to form by the City Attorney.

C. Duration of the Guarantee. The guarantee shall remain in effect until the improvement is actually constructed and accepted by the city. Once the city has inspected and accepted the improvement, the city shall release the guarantee to the permittee. If the improvement is not completed to the city's satisfaction within the time limits specified in the permit approval, the City Engineer may, at their discretion, draw upon the guarantee and use the proceeds to construct or complete construction of the improvement and for any related administrative and legal costs incurred by the city in completing the construction, including any costs incurred in attempting to have the permittee complete the improvement. Once constructed and approved by the city, any remaining funds shall be refunded to the permittee. The City shall not allow a permittee to defer construction of improvements by using a performance guarantee, unless the permittee agrees to construct those improvements upon written notification by the city, or at some other mutually agreed-to time. If the permittee fails to commence construction of the required improvements within six months of being instructed to do so, the city may, without further notice, undertake the construction of the improvements and draw upon the permittee's performance guarantee to pay those costs.

17.50.150 Covenant with the City.

A. The City may impose as a condition of final approval of a quasi-judicial permit, the requirement that the applicant execute a covenant with the City agreeing to comply with all conditions of approval. Any such covenant shall include the following elements:
   1. An agreement that the applicant will comply with all applicable code requirements, conditions of approval and any representations made to the City by the applicant or the applicant's agents during the application review process, in writing. This commitment shall be binding on the applicant and all of the applicant's successors, heirs and assigns;
   2. If the owner fails to perform under the covenant, the City may immediately institute revocation of the approval or any other enforcement action available under state law or this code. The covenant may also provide for payment of attorney fees and other costs associated with any such enforcement action; and
   3. Where the development rights of one site are dependent on the performance of conditions by the owner of another property (such as joint access), the covenants are judicially enforceable by the owner of one site against the owner of another.

B. Adopting the covenant: The form of all covenants shall be approved by the City attorney. The covenant shall run with the land and shall be placed in the county deed records prior to the issuance of any permits or development activity pursuant to the approval. Proof of recording shall be made prior to the issuance of any permits and filed with the Planning Division. Recording shall be at the applicant's expense. Any covenant required under this section shall be properly signed and executed within thirty days after permit approval with conditions; provided, however, that the Community Development Director may grant reasonable extensions, not to exceed an additional thirty days, in cases of practical difficulty. Failure to sign and record the covenant within the prescribed period shall require a new application for any use of the subject property.

17.50.160 Ex parte Contact, Conflict of Interest and Bias.

The following rules shall govern any challenges to a decision-maker's participation in a quasi-judicial or legislative action:

A. Ex parte Contacts. Any factual information obtained by a decision-maker outside the context of a quasi-judicial hearing shall be deemed an ex parte contact. Prior to the close of the record in any

particular matter, any decision-maker that has obtained any materially factual information through an ex parte contact shall declare the content of that contact and allow any interested party to rebut the substance of that contact. This rule does not apply to legislative proceedings.

B. Conflict of Interest. Whenever a decision-maker, or any member of a decision-makers's immediate family or household, has a financial interest in the outcome of a particular quasi-judicial or legislative matter, that decision-maker shall not participate in the deliberation or decision on that matter.

C. Bias. All decisions in quasi-judicial matters shall be fair, impartial and based on the applicable approval standards and the evidence in the record. Any decision-maker who is unable to render a decision on this basis in any particular matter shall refrain from participating in the deliberation or decision on that matter. This rule does not apply to legislative proceedings.

17.50.170 Legislative Hearing Process.

A. Purpose. Legislative actions involve the adoption or amendment of the City's land use regulations, comprehensive plan, maps, inventories and other policy documents that affect the entire city or large portions of it. Legislative actions which affect land use must begin with a public hearing before the planning commission.

B. Planning Commission Review.

1. Hearing Required. The Planning Commission shall hold at least one public hearing before recommending action on a legislative proposal. Any interested person may appear and provide written or oral testimony on the proposal at or prior to the hearing. The Community Development Director shall notify the Oregon Department of Land Conservation and Development (DLCD) as required by the post-acknowledgment procedures of ORS 197.610 to 197.625, as applicable.
2. The Community Development Director's Report. Once the Planning Commission hearing has been scheduled and noticed in accordance with Section 17.50.090(C) and any other applicable laws, the Community Development Director shall prepare and make available a report on the legislative proposal at least seven days prior to the hearing.
3. Planning Commission Recommendation. At the conclusion of the hearing, the Planning Commission shall adopt a recommendation on the proposal to the City Commission. The Planning Commission shall make a report and recommendation to the City Commission on all legislative proposals. If the Planning Commission recommends adoption of some form of the proposal, the Planning Commission shall prepare and forward to the City Commission a report and recommendation to that effect.

C. City Commission Review.

1. City Commission Action. Upon a recommendation from the Planning Commission on a legislative action, the city commission shall hold at least one public hearing on the proposal. Any interested person may provide written or oral testimony on the proposal at or prior to the hearing. At the conclusion of the hearing, the City Commission may adopt, modify or reject the legislative proposal, or it may remand the matter to the Planning Commission for further consideration. If the decision is to adopt at least some form of the proposal, and thereby amend the City's land use regulations, Comprehensive Plan, official zoning maps or some component of any of these documents, the City Commission decision shall be enacted as an ordinance.
2. Notice of Final Decision. Not later than five days following the City Commission final decision, the Community Development Director shall mail notice of the decision to DLCD in accordance with ORS 197.615(2).

17.50.180 Objections to Procedure.

Any party who objects to the procedure followed in any particular matter, including bias, conflict of interest and undisclosed ex parte contacts, must make a procedural objection prior to the city rendering a final decision. Procedural objections may be raised at any time prior to a final decision, after which they

are deemed waived. In making a procedural objection, the objecting party must identify the procedural requirement that was not properly followed and identify how the alleged procedural error harmed that person's substantial rights.

17.50.190 Appeals.

Appeals of any non-final decisions by the city must comply with the requirements of this section.

A. Type I decisions by the planning manager are not appealable to any other decision-maker within the city.

B. A notice of appeal of any Type II, III or IV decision must be received in writing by the planning division within –fourteen calendar days from the date notice of the challenged decision is provided to those entitled to notice. Late filing of any appeal shall be deemed a jurisdictional defect and will result in the automatic rejection of any appeal so filed.

C. The following must be included as part of the notice of appeal:

1. The city planning file number and date the decision to be appealed was rendered;
2. The name, mailing address and daytime telephone number for each appellant;
3. A statement of how each appellant has an interest in the matter and standing to appeal;
4. A statement of the specific grounds for the appeal;
5. The appropriate appeal fee. Failure to include the appeal fee within appeal period is deemed to be a jurisdictional defect and will result in the automatic rejection of any appeal so filed. If a City-recognized neighborhood association with standing to appeal has voted to request a fee waiver pursuant to 17.50.290(C), no appeal fee shall be required for an appeal filed by that association. In lieu of the appeal fee, the neighborhood association shall provide a duly adopted resolution of the general membership or board approving the request for fee waiver.

D. Standing to Appeal. The following rules prescribe who has standing to appeal:

1. For Type II decisions, only those persons or recognized Neighborhood Associations who have submitted written comments within the fourteen-day comment period have standing to appeal a planning manager decision. Grounds for appeal are limited to those issues raised in writing during the fourteen-day comment period in filing an appeal to the city commission.
2. For Type III and IV decisions, only those persons or recognized Neighborhood Associations who have participated either orally or in writing have standing to appeal the decision of the planning commission or historic review board, as applicable. Grounds for appeal are limited to those issues raised either orally or in writing before the close of the public record.

E. Notice of the Appeal Hearing. The planning division shall issue notice of the appeal hearing to all parties who participated either orally or in writing before the close of the public record in accordance with Section 17.50.090(B). Notice of the appeal hearing shall contain the following information:

1. The file number and date of the decision being appealed;
2. The time, date and location of the public hearing;
3. The name of the applicant, owner and appellant (if different);
4. The street address or other easily understood location of the subject property;
5. A description of the permit requested and the applicant's development proposal;
6. A brief summary of the decision being appealed and the grounds for appeal listed in the notice of appeal;
7. A statement that the appeal hearing is confined to the issues raised in the notice of appeal;
8. A general explanation of the requirements for participation and the city's hearing procedures.

F. Appeal Hearing--Scope of Review. Appeal hearings shall comply with the procedural requirements of Section 17.50.120. Appeal hearings shall be conducted by the city commission or a planning commission or historic review board, as applicable, the decision shall be on the record and the issues under consideration shall be limited to those listed in the notice of appeal.

17.50.200 Expiration of an Approval.

A. When approvals become void: All Type I-IV approvals, except for zone changes,, comprehensive plan map amendments, conditional uses and master plans automatically become void if any of the following events occur:
   1. If, within two years of the date of the final decision, a building permit has not been issued 2. If, within two years of the date of the final decision for all land divisions, the activity approved in the permit has not commenced or, in situations involving only the creation of lots, the public improvements and conditions of approval have not been completed or financial guarantee (surety) provided.
   3. Annexations become void if a vote of the citizens rejects the application.

B. New application required: Expiration of an approval shall require a new application for any use on the subject property that is not otherwise allowed outright.

C. Deferral of the expiration period due to appeals: If a permit decision is appealed beyond the jurisdiction of the City, the expiration period shall not begin until review before the Land Use Board of Appeals and the appellate courts has been completed, including any remand proceedings before the City. The expiration period provided for in this section will begin to run on the date of final disposition of the case (the date when an appeal may no longer be filed).

17.50.210 Extension of an Approval.

A. The Community Development Director may extend, prior to its expiration, any approved permit for a period of one year- provided- that the applicant has provided evidence of implementation of the permit. Any request for an extension shall be reviewed and decided upon by the Community Development Director as a Type I- decision.

B. Substantial implementation of a permit shall require at a minimum, demonstrable evidence in a written application showing:
   1. The permit holder has applied for the permits required as a condition of the land use or limited land use permit;
   2. 3. The request for an extension is not sought for purposes of avoiding any responsibility imposed by this code or the permit or any condition thereunder; and
   4. There have been no changes in circumstances or the law likely to necessitate significant modifications of the development approval or conditions of approval.

17.50.220 Reapplication Limited.

If the application is denied or withdrawn following the close of the public hearing, no reapplication for the same or substantially similar proposal may be made for one year following the date of final decision denying the permit.

17.50.230 Interpretation.

Where a provision of Title 16 or Title 17 conflicts with another city ordinance or requirement, the provision or requirement that is more restrictive or specific shall control.

17.50.240 Conformity of Permits.

The City shall not accept any application for a permit, certificate or other approval, including building permit applications, for any property that is not in full compliance with all applicable provisions of Title 16 and Title 17 and any permit approvals previously issued by the city.

17.50.260 Reconsideration of a Final Decision.

Under this section, parties with standing may seek reconsideration of a final decision rendered pursuant to a Type II, Type III, or Type IV process. Reconsideration is warranted where the City's decision indicates the decision-maker failed to understand or consider certain relevant facts in the record or misinterpreted the application in some material way. Any request for reconsideration must be received by the Planning Division within ten days of when the decision in question was rendered and must specifically describe the alleged misunderstanding or misinterpretation. A request for reconsideration shall not stay the effectiveness of the City's final decision, nor shall it affect any applicable appeal deadlines to the land use board of appeals. If the request is granted, the Community Development Director shall notify all affected parties that the decision will be reconsidered. Any request for reconsideration by the applicant shall be deemed a waiver of the one-hundred-twenty-day deadline under Section 17.50.070.

17.50.270 Revocation of a Previously Approved Permit.

In the event an applicant, or the applicant's successor in interest, fails to fully comply with all conditions of permit approval or otherwise does not comply fully with the City's approval, the City may institute a revocation or modification proceeding under this section.

A. Situations when Permit Approvals May Be Revoked or Modified. All quasi-judicial permits may be revoked or modified if the Planning Commission determines a substantial likelihood that any of the following situations exists:
   1. One or more conditions of the approval have not been implemented or have been violated;
   2. The activities of the use, or the use itself, are substantially different from what was approved; or
   3. The use is subject to the nonconforming use regulations, the applicant has not obtained approval, and has substantially changed its activities or substantially increased the intensity of its operations since the use became nonconforming.

B. Process for Revocation and Modification. Revocation or modification shall be processed as a Type IV decision. The Planning Division or any private complaining party shall have the burden of proving, based on substantial evidence in the whole record, that the applicant or the applicant's successor has in some way violated the City's approval.

C. Possible Actions at the Revocation Hearing. Depending on the situation, the Planning Commission may take any of the actions described below. The Planning Commission may not approve the new use or a use that is more intense than originally approved unless the possibility of this change has been stated in the public notice. Uses or development which are alleged to have not fulfilled conditions, violate conditions or the use is not consistent with the City's approval may be subject to the following actions:
   1. The Planning Commission may find that the use or development is complying with the conditions of the approval. In this case, the use or development shall be allowed to continue.
   2. The Planning Commission may modify the approval if it finds that the use or development does not meet the standards for revocation and that the use can comply with the original approval criteria if certain conditions are met. In this case, the Planning Commission may modify the existing conditions, add new conditions to ensure compliance with the approval criteria, or refer the case to the code compliance officer for enforcement of the existing conditions.
   3. The Planning Commission may revoke the approval if it finds there are substantial violations of conditions or failure to implement conditions of prior land use decisions, such that the original approval criteria for the use or development are not being met.

D. Effect of Revocation. In the event permit approval is revoked, the use or development becomes illegal. The use or development shall be terminated within thirty days of the date the revocation final order is approved by the Planning Commission, unless the decision provides otherwise. In the event the decision-maker's decision on a revocation request is appealed, the revocation action shall be stayed pending a final, unappealed decision.

17.50.280 Transfer of Approval Rights.

Unless otherwise stated in the City's permit decision, any approval granted under Title 16 or Title 17 of this code runs with the land and is transferred with ownership of the land. Any conditions, time limits or other restrictions imposed with a permit approval shall bind all subsequent owners of the property for which the permit was granted.

17.50.290 Fees.

The City may adopt by resolution, and revise from time to time, a schedule of fees for applications and appeals. Fees shall be based upon the City's actual or average cost of processing the application or conducting the appeal process. The only exception shall be the appeal fee for a Type II decision, which shall be limited by ORS 227.175(10)(b). The requirements of this section shall govern the payment, refund and reimbursement of fees.

A. Payment. All fees shall be due and payable at the time the application or appeal is submitted. No application or appeal shall be accepted without the proper fee being paid.

B. Refunds. Fees will only be refunded as provided in this subsection:
   1. When a fee is paid for an application which is later found to not be required, the city shall refund the fee.
   2. Errors. When an error is made in calculating a fee, overpayment will be refunded.
   3. Refund upon Withdrawal of an Application. In the event an applicant withdraws an application, the planning department shall refund the unused portion of the fee. In this case, the planning department will deduct from the fee the city's actual costs incurred in processing the application prior to withdrawal.

C. Fee Waivers. The Planning Division may waive all or any portion of an application fee if, in the opinion of the director, a particular application must be resubmitted because of an error made by the City. Appeal fees may be waived, wholly or in part, by the City Commission, if the City Commission finds that, considering fairness to the applicant and to opposing parties, a full or partial waiver of the appeal fee is warranted. Appeal fees shall not be charged for an appeal filed by a city-recognized neighborhood association, so long as the appeal has been officially approved by the general membership or board of the neighborhood association at a duly announced meeting.

Oregon City Municipal Code
Chapter 17.52 Off-Street Parking and Loading

17.52.010 Applicability.
The construction of a new structure or parking lot, or alterations to the size or use of an existing structure, parking lot or property use shall require site plan review approval and compliance with this chapter. This chapter does not apply to single- and two-family residential dwellings.

17.52.020 Number of Automobile Spaces Required.

A. The number of parking spaces shall comply with the minimum and maximum standards listed in Table 17.52.020. The parking requirements are based on spaces per 1,000 square feet gross leasable area unless otherwise stated.

Table 17.52.020 LAND USE	PARKING REQUIREMENTS	
	MINIMUM	MAXIMUM
Single-Family Dwelling	1.00 per unit	
Multi-Family: Studio	1.00 per unit	1.5 per unit
Multi-Family: 1 bedroom	1.25 per unit	2.00 per unit
Multi-Family: 2 bedroom	1.5 per unit	2.00 per unit
Multi-Family: 3 bedroom	1.75 per unit	2.50 per unit
Hotel/Motel	1.0 per guest room	1.25 per guest room
Welfare/Correctional Institution	1 per 7 beds	1 per 5 beds
Senior housing, including congregate care, residential care and assisted living facilities; nursing homes and other types of group homes;	1 per 7 beds	1 per 5 beds
Hospital	2.00	4.00
Religious Assembly Building	0.25 per seat	0.5 per seat
Preschool Nursery/ Kindergarten	2.00	3.00
Elementary/Middle School	1 per classroom	1 per classroom + 1 per administrative employee + 0.25 per seat in auditorium/assembly room/stadium
High School/College/Commercial School for Adults	0.20 per # staff and students	0.30 per # staff and students
Auditorium/Meeting Room/Stadium	.25	0.5 per seat
Retail Store/ Shopping Center/	4.10	5.00

Restaurants		
Office	2.70	3.33
Medical or Dental Clinic	2.70	3.33
Sports Club/ Recreation Facilities	Case Specific	5.40
Storage Warehouse/ Freight Terminal	0.30 per gross sq-ft	0.40 per gross sq-ft
Manufacturing/ Wholesale Establishment	1.60 per gross sq-ft	1.67 per gross sq-ft
Light Industrial/ Industrial Park	1.3	1.60

1. Multiple Uses. In the event several uses occupy a single structure or parcel of land, the total requirements for off-street parking shall be the sum of the requirements of the several uses computed separately.
2. Requirements for types of buildings and uses not specifically listed herein shall be determined by the Community Development Director, based upon the requirements of comparable uses listed.
3. Where calculation in accordance with the following list results in a fractional space, any fraction less than one-half shall be disregarded and any fraction of one-half or more shall require one space.
4. The minimum required parking spaces shall be available for the parking of operable passenger automobiles of residents, customers, patrons and employees only, and shall not be used for storage of vehicles or materials or for the parking of trucks used in conducting the business or use.
5. A Change in Use within an existing building located in the MUD Design District is exempt from additional parking requirements. Additions to an existing building or new construction in the District are required to meet the minimum parking requirements in Table 17.52.020.

B. Reduction of the Number of Automobile Spaces Required. The required number of parking stalls may be reduced if one or more of the following is met:

1. Transit Oriented Development. The Community Development Director may reduce the required number of parking stalls up to 10% when it is determined that a commercial business center or multi-family project is adjacent to or within 1,000 feet of an existing or planned public transit. Also, if a commercial center is within 1,000 feet of a multi-family project, with over 80 units and pedestrian access, the parking requirements may be reduced by10%
2. Transportation Demand Management. The Community Development Director may reduce the required number of parking stalls up to 10% when a parking-traffic study prepared by a traffic engineer demonstrates:
   a. Alternative modes of transportation, including transit, bicycles, and walking, and/or special characteristics of the customer, client, employee or resident population will reduce expected vehicle use and parking space demand for this development, as compared to standard Institute of Transportation Engineers vehicle trip generation rates and minimum city parking requirements.
   b. A Transportation Demand Management (TDM) Program has been developed for approval by the City Engineer. The plan will contain strategies for reducing vehicle use and parking demand generated by the development and will be measured annually. If, at the annual assessment, the City determines the plan is not successful, the plan may be revised.

If the City determines that no good-faith effort has been made to implement the plan, the City may take enforcement actions.

3. Shared Parking. The Community Development Director may reduce the required number of parking stalls up to 50% for:
   a. Mixed uses. If more than one type of land use occupies a single structure or parcel of land, the total requirements for off-street automobile parking shall be the sum of the requirements for all uses, unless it can be shown that the peak parking demands are actually less (i.e., the uses operate on different days or at different times of the day). In that case, the total requirements shall be reduced accordingly, up to a maximum reduction of 50%, as determined by the Community Development Director.
   b. Shared parking. Required parking facilities for two or more uses, structures, or parcels of land may be satisfied by the same parking facilities used jointly, to the extent that the owners or operators show that the need for parking facilities does not materially overlay (e.g., uses primarily of a daytime versus nighttime nature), that the shared parking facility is within 1,000 feet of the potential uses, and provided that the right of joint use is evidenced by a recorded deed, lease, contract, or similar written instrument establishing the joint use.
4. Reduction in Parking for Tree Preservation. The Community Development Director may grant an adjustment to any standard provided that the adjustment preserves a regulated tree or grove so that the reduction in the amount of required pavement can help preserve existing healthy trees in an undisturbed, natural condition. The amount of reduction can be determined only after taking into consideration any unique site conditions and the impact of the reduction on parking needs for the use, and must be approved by the Community Development Director. This reduction is discretionary and subject to the approval of the Community Development Director.
5. On-Street Parking. On-street parking for commercial, multifamily, industrial and institutional, uses shall conform to the following standards:
   1. Dimensions. The following constitutes one on-street parking space:
      a. Parallel parking, each [22] feet of uninterrupted and available curb;
      b. [45/60] degree diagonal, each with [12] feet of curb;
      c. 90 degree (perpendicular) parking, each with [12] feet of curb.
   2. Location. Parking may be counted toward the minimum standards in the Parking Requirement Table below when it is on the block abutting the subject land use. An on-street parking space must not obstruct a required clear vision area and it must not violate any law or street standard.
   3. Public Use Required for Credit. On-street parking spaces counted toward meeting the parking requirements of a specific use may not be used exclusively by that use, but shall be available for general public use at all times. Signs or other actions that limit general public use of on-street spaces are prohibited.

17.52.030 Standards for Automobile Parking.

A. Access. Ingress and egress locations on public thoroughfares shall be located in the interests of public traffic safety. Groups of more than four parking spaces shall be so located and served by driveways so that their use will require no backing movements or other maneuvering within a street right-of-way other than an alley. No driveway with a slope of greater than fifteen percent shall be permitted without approval of the city engineer.

B. Surfacing. Required off-street parking spaces and access aisles shall have paved surfaces adequately maintained. The use of pervious asphalt/concrete and alternative designs that reduce storm water runoff and improve water quality pursuant to the city's Stormwater and Low Impact Development Design Standards are encouraged.

C. Drainage. Drainage shall be designed in accordance with the requirements of Chapter 13.12 and the city public works stormwater and grading design standards.

D. Dimensional Standards.

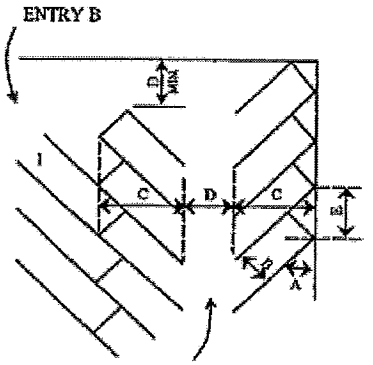
1. Requirements for parking developed at varying angles are according to the table included in this section. A parking space shall not be less than seven feet in height when within a building or structure, and shall have access by an all-weather surface to a street or alley. Parking stalls in compliance with the American with Disabilities Act may vary in size in order to comply with the Building Division requirements. Up to 35% of the minimum required parking may be compact, while the remaining required parking stalls are designed to standard dimensions. The Community Development Director may approve alternative dimensions for parking stalls in excess of the minimum requirement which comply with the intent of this chapter.
2. Alternative parking/ plan. Any applicant may propose an alternative parking plan. Such plans are often proposed to address physically constrained or smaller sites, however innovative designs for larger sites may also be considered. In such situations, the Community Development Director may approve an alternative parking lot plan with variations to parking dimensions of this section.The alternative shall be consistent with the intent of this chapter and shall create a safe space for automobiles and pedestrians while providing landscaping to the quantity and quality found within parking lot landscaping requirements.

PARKING STANDARD
PARKING ANGLE SPACE DIMENSIONS

A Parking Angle		**B Stall Width**	**C Stall to Curb**	**D Aisle Width**	**E Curb Length**	**F Overhang**
0 degrees		8.5	9.0	12	20	0
30 degrees	Standard Compact	9' 8'	17.3' 14.9'	11' 11'	18' 16'	
45 degrees	Standard Compact	8.5 8.5	19.8' 17.0'	13' 13'	12.7' 11.3'	1.4
60 degrees	Standard Compact	9' 8'	21' 17.9'	18' 16'	10.4' 9.2'	1.7
90 degrees	Standard Compact	9' 8'	19.0' 16.0'	24' 22'	9' 8'	1.5

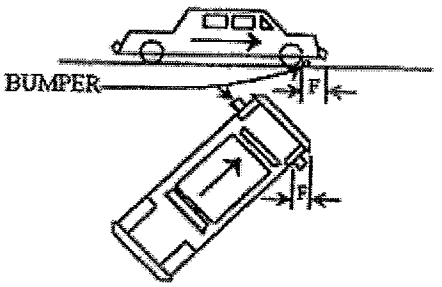
All dimensions are to the nearest tenth of a foot.

TYPICAL PARKING LAYOUT



ENTRY A

NOTE: SPACE 1 CONTINGENT UPON ENTRY B



OVERHANG
NOTE: Overhang dimensions are intended to indicate possible location from parking area edge for location of bumpers.

E. Carpool and Vanpool Parking. New office and industrial developments with seventy-five or more parking spaces, and new hospitals, government offices, nursing and retirement homes, schools and transit park-and-ride facilities with fifty or more parking spaces, shall identify the spaces available for employee, student and commuter parking and designate at least 5%, but not fewer than two, of those spaces for exclusive carpool and vanpool parking. Carpool and vanpool parking spaces shall be located closer to the main employee, student or commuter entrance than all other employee, student or commuter parking spaces with the exception of handicapped parking spaces. The carpool/vanpool spaces shall be clearly marked "Reserved - Carpool/Vanpool Only."

17.52.040 Bicycle Parking Standards-

A. Purpose-Applicability. To encourage bicycle transportation to help reduce principal reliance on the automobile, and to ensure bicycle safety and security, bicycle parking shall be provided in conjunction with all uses other than single-family dwellings or duplexes.

B. Number of Bicycle Spaces Required. For any use not specifically mentioned in Table A, the bicycle parking requirements shall be the same as the use which, as determined by the Community Development Director is most similar to the use not specifically mentioned. Calculation of the number of bicycle parking spaces required shall be determined in the manner established in Section 17.52.020 for determining automobile parking space requirements.

TABLE A Required Bicycle Parking Spaces*	
USE	**BICYCLE PARKING**
Residential	
Multiple family (three or more units)	1 per unit
Commercial Residential	
Hotel and Motel	1 per 10 guest rooms
Rooming or boarding houses	1 per 10 guest rooms
Bed and breakfast inns	1 per 10 guest rooms
Club/lodge	1 per 20 auto spaces
Institutional	
Welfare institution	1 per 20 auto spaces
Correctional institution	1 per 30 auto spaces
Nursing home, care facility, sanitarium	1 per 30 auto spaces
Hospital	1 per 20 auto spaces
Park-and-ride lot	5 per acre, at least one of which is a locker
Transit center	5 per center, at least one of which is a locker
Parks and open space	1 per 10 auto spaces
Public parking lots	1 per 20 auto spaces
Automobile parking structures	1 per 20 auto spaces
Places of Public Assembly	
Religious institutions	1 per 20 auto spaces
Libraries, museums	1 per 10 auto spaces
Preschool, nursery, kindergarten	2 spaces
Elementary, junior high	4 per classroom
High school	2 per classroom
College, business/commercial schools	2 per classroom
Other auditorium/meeting room	1 per 20 auto spaces
Commercial Amusement	
Stadium, arena, theater	1 per 20 auto spaces
Bowling alley, skating rink, dance hall	1 per 15 auto spaces
Commercial	
Retail stores and shopping centers	1 per 20 auto spaces
Retail stores handling exclusively bulky merchandise such as automobile, boat or trailer sales or rental	1 per 40 auto spaces

Bank, office	1 per 20 auto spaces
Medical and dental clinic	1 per 20 auto spaces
Convenience food store	1 per 10 auto spaces
Furniture and appliance stores	1 per 40 auto spaces
Eating and drinking establishment,	1 per 20 auto spaces
Auto repair garage and gasoline service station	2 spaces
Mortuaries	not applicable
Swimming pools, gymnasiums, ball courts	1 per 10 auto spaces
Industrial	
Storage warehouse a	1 per 50 auto spaces
Manufacturing	1 per 40 auto spaces

C. Location of Bicycle Parking

1. Bicycle parking shall be located on-site, in one or more convenient, secure and accessible location. The City Engineer and the Community Development Director may permit the bicycle parking to be provided within the public right-of-way. If sites have more than one building, bicycle parking shall be distributed as appropriate to serve all buildings. If a building has two or more main building entrances, the review authority may require bicycle parking to be distributed to serve all main building entrances, as it deems appropriate.
2. Bicycle parking areas shall be clearly marked or visible from on-site buildings or the street. If a bicycle parking area is not plainly visible from the street or main building entrance, a sign must be posted indicating the location of the bicycle parking area. Indoor bicycle parking areas shall not require stairs to access the space unless approved by the Community Development Director.
3. All bicycle parking areas shall be located to avoid conflicts with pedestrian and motor vehicle movement.
   a. Bicycle parking areas shall be separated from motor vehicle parking and maneuvering areas and from arterial streets by a barrier or a minimum of five feet.
   b. Bicycle parking areas shall not obstruct pedestrian walkways; provided, however, that the review authority may allow bicycle parking in the public sidewalk where this does not conflict with pedestrian accessibility.
4. Accessibility.
   a. Outdoor bicycle areas shall be connected to main building entrances by pedestrian accessible walks.
   b. Outdoor bicycle parking areas shall have direct access to a public right-of-way.

D. Bicycle parking facilities shall offer security in the form of either a lockable enclosure in which the bicycle can be stored or a stationary rack to which the bicycle can be locked. All bicycle racks and lockers shall be securely anchored to the ground or to a structure. Bicycle racks shall be designed so that bicycles may be securely locked to them without undue inconvenience.

17.52.060 Parking Lot Landscaping.

Purpose. The purpose of this code section includes the following:

1. To enhance and soften the appearance of parking lots;
2. To limit the visual impact of parking lots from sidewalks, streets and particularly from residential areas;
3. To shade and cool parking areas;
4. To reduce air and water pollution;
5. To reduce storm water impacts and improve water quality; and
6. To establish parking lots that are more inviting to pedestrians and bicyclists.

A. Development Standards

1. The landscaping shall be located in defined landscaped areas that are uniformly distributed throughout the parking or loading area.
2. All areas in a parking lot not used for parking, maneuvering, or circulation shall be landscaped.
3. Parking lot trees shall be a mix of deciduous shade trees and coniferous trees. The trees shall be evenly distributed throughout the parking lot as both interior and perimeter landscaping to provide shade.
4. Required landscaping trees shall be of a minimum two-inch minimum caliper size (though it may not be standard for some tree types to be distinguished by caliper), planted according to American Nurseryman Standards, and selected from the Oregon City Street Tree List;
5. Landscaped areas shall include irrigation systems unless an alternate plan is submitted, and approved by the Community Development Director, that can demonstrate adequate maintenance
6. All plant materials, including trees, shrubbery and ground cover should be selected for their appropriateness to the site, drought tolerance, year-round greenery and coverage and staggered flowering periods. Species found on the Oregon City Native Plant List are strongly encouraged and species found on the Oregon City Nuisance Plant List are prohibited.
7. The landscaping in parking areas shall not obstruct lines of sight for safe traffic operation and shall comply with all requirements of Chapter 10.32, Traffic Sight Obstructions.
8. Landscaping shall incorporate design standards in accordance with Chapter 13.12, Stormwater Management.

B. Perimeter Parking Lot Landscaping and Parking Lot Entryway/Right-of-Way Screening. Parking lots shall include a 5-foot wide landscaped buffer where the parking lot abuts the right-of-way and/or adjoining properties. In order to provide connectivity between non-single-family sites, the Community Development Director may approve an interruption in the perimeter parking lot landscaping for a single driveway where the parking lot abuts property designated as multi-family, commercial or industrial. Shared driveways and parking aisles that straddle a lot line do not need to meet perimeter landscaping requirements.

1. The perimeter parking lot are shall include:
   a. Trees spaced a maximum of thirty-five feet apart (minimum of one tree on either side of the entryway is required). When the parking lot is adjacent to a public right-of-way, the parking lot trees shall be offset from the street trees;
   b. Ground cover, such as wild flowers, spaced a maximum of 16-inches on center covering one hundred percent of the exposed ground within 3 years. No bark mulch shall be allowed except under the canopy of shrubs and within two feet of the base of trees; and

c. An evergreen hedge screen of thirty to forty-two inches high or shrubs spaced no more than four feet apart on average. The hedge/shrubs shall be parallel to and not nearer than two feet from the right-of-way line. The required screening shall be designed to allow for free access to the site and sidewalk by pedestrians. Visual breaks, no more than five feet in width, shall be provided every thirty feet within evergreen hedges abutting public right-of-ways.

C. Parking Area/Building Buffer. Parking areas shall be separated from the exterior wall of a structure, exclusive of pedestrian entranceways or loading areas, by one of the following:

1. Minimum five-foot wide landscaped planter strip (excluding areas for pedestrian connection) abutting either side of a parking lot sidewalk with:
   a. Trees spaced a maximum of thirty-five feet apart;
   b. Ground cover such as wild flowers, spaced a maximum of 16-inches on center covering one hundred percent of the exposed ground within three years. No bark mulch shall be allowed except under the canopy of shrubs and within two feet of the base of trees; and
   c. An evergreen hedge of thirty to forty-two inches or shrubs placed no more than four feet apart on average; or
2. Seven-foot sidewalks with shade trees spaced a maximum of thirty-five feet apart in three-foot by five-foot tree wells.

D. Interior Parking Lot Landscaping. Surface parking lots shall have a minimum ten percent of the interior of the gross area of the parking lot devoted to landscaping to improve the water quality, reduce storm water runoff, and provide pavement shade. Interior parking lot landscaping shall not be counted toward the fifteen percent minimum total site landscaping required by Section 17.62.050(1) unless otherwise permitted by the dimensional standards of the underlying zone district. Pedestrian walkways or any impervious surface in the landscaped areas are not to be counted in the percentage. Interior parking lot landscaping shall include:

   a. A minimum of one tree per six parking spaces.
   b. Ground cover, such as wild flowers, spaced a maximum of 16-inches on center covering one hundred percent of the exposed ground within three years. No bark mulch shall be allowed except under the canopy of shrubs and within two feet of the base of trees.
   c. Shrubs spaced no more than four feet apart on average.
   d. No more than eight contiguous parking spaces shall be created without providing an interior landscape strip between them. Landscape strips shall be provided between rows of parking shall be a minimum of six feet in width and a minimum of 10 feet in length.
   e. Pedestrian walkways shall have shade trees spaced a maximum of every thirty-five feet in a minimum three-foot by five-foot tree wells; or
      Trees spaced every thirty-five feet, shrubs spaced no more than four feet apart on average, and ground cover covering one hundred percent of the exposed ground. No bark mulch shall be allowed except under the canopy of shrubs and within two feet of the base of trees.

E. Installation.

1. All landscaping shall be installed according to accepted planting procedures, according to American Nurseryman Standards.
2. The site, soils and proposed irrigation systems shall be appropriate for the healthy and long-term maintenance of the proposed plant species.

3. Certificates of occupancy shall not be issued unless the landscaping requirements have been met or other arrangements have been made and approved by the city, such as the posting of a surety.

17.52.070. Alternative landscaping plan.

Any applicant may propose an alternative landscaping plan. Such plans are often proposed to address physically constrained or smaller sites, however innovative designs for larger sites may also be considered. Alternative plans may include the use of low impact development techniques and minimized landscaping requirements. In such situations, the Community Development Director may approve variations to the landscaping standards of section 17.52.060.

A. General Review Standard. The alternative shall be meet or exceed the intent of this chapter and shall create a safe space for automobiles and pedestrians. The alternative landscaping plan shall be prepared by a licensed landscape architect.

B. Credit for Pervious / Low Impact Development. The Community Development Director may count up to 50% of the square footage of any pervious hardscaped landscape material within a parking lot that is designed and approved pursuant to the City's adopted Stormwater and Low Impact Development Design Standards toward minimum landscaping requirements for the site. (This includes porous pavement detention, open celled block pavers, porous asphalt, porous concrete pavement, porous turf, porous gravel, etc).

17.52.080. Maintenance.

The owner, tenant and their agent, if any, shall be jointly and severally responsible for the maintenance of the site including but not limited to the off-street parking and loading spaces, bicycle parking and all landscaping which shall be maintained in good condition so as to present a healthy, neat and orderly appearance and shall be kept free from refuse and debris.

All plant growth in interior landscaped areas shall be controlled by pruning, trimming, or otherwise so that:

a. It will not interfere with the maintenance or repair of any public utility;
b. It will not restrict pedestrian or vehicular access; and
c. It will not constitute a traffic hazard due to reduced visibility.

Oregon City Municipal Code
Chapter 17.54 Supplemental Zoning Regulations and Exceptions

17.54.010 Accessory Buildings and Uses.

Accessory buildings and uses shall comply with all requirements for the principal use except where specifically modified by this title and shall comply with the following limitations:

A. Signs. Signs shall be permitted as provided in Chapter 15.28.

B. Accessory Buildings Dimensional Requirements. The following setbacks and other dimensional requirements shall apply to all accessory buildings and uses:

1. Building Footprint Less than Two Hundred Square Feet. An interior side or rear yard setback behind the front building line may be reduced to three feet for any detached accessory structure with a building footprint which is less than two hundred square feet in area and does not exceed a height of fourteen feet (measured from the average grade on the front of the structure to the midpoint of the roof). No portion of any such structure shall project across a lot line and the accessory structure shall be located behind the front building line of the primary structure. A building permit is required for accessory buildings over 10 feet in height (measured from the interior floor to the midpoint of the roof) or over 200 square feet in size.
2. Building Footprint from Two Hundred to Six Hundred Square Feet. The accessory building must be constructed with the same exterior building materials as that of the primary structure, or an acceptable substitute to be approved by the planning division. The accessory structure shall be located behind the front building line of the primary structure. The interior side and rear yard setbacks may be reduced to three feet for one accessory structure, and its projections, within this category provided the structure and its projections:
   a. Are detached and separated from other structures by at least three feet;
   b. Do not exceed a height of fourteen feet;
3. Building Footprint Over Six Hundred Square Feet. One accessory structure with a building footprint in excess of six hundred square feet may be approved by the planning division. An accessory structure footprint in excess of six hundred square feet must meet the setback requirements of the district in which it is located, and must also meet the following provisions:
   a. The accessory building must be compatible with the primary structure and constructed with the same exterior building materials as that of the primary structure, or an acceptable substitute to be approved by the planning division.
   b. The lot must be in excess of twenty thousand square feet.
   c. The building footprint of the accessory structure shall not exceed the building footprint of the primary structure. In no case may the accessory building footprint exceed eight hundred square feet.
   d. The accessory structure shall not exceed the height of the primary structure and shall be located behind the front building line of the primary structure.
4. Membrane or Fabric Covered Storage Area. All membrane and fabric structures:
   a. Shall be located behind the front building line of the primary structure.
   b. Shall not be visible from the abutting Right-of-Way when viewed at pedestrian level.
   c. Exceptions to these standards may be made by the Community Development Director for temporary storage of materials as long as the membrane or fabric covered storage area is removed within 10 days, is not erected for more than 20 days in one calendar year and is not seen as a nuisance to the city.
   d. This section shall be effective on January 1, 2011. This section shall apply to all membrane or fabric covered storage areas in place before, on, or after the effective date of this section.
   e. This prohibition does not apply to membrane covered areas displayed for garden or other active outdoor uses.

C. Private Stable. A private stable may be permitted on a lot having a minimum area of twenty thousand square feet. The capacity of a stable shall not exceed one horse or other domestic hoofed animal for each twenty thousand square feet of lot area. A stable shall be located not less than twenty-five feet from any street line.
D. Swimming Pools. In-ground and above-ground swimming pools shall be constructed not less than three feet from the side or rear yard lines. Swimming pools shall comply with the front yard requirement for the principal building. A pool must be surrounded by a fence no less than four feet in height or a suitable alternative such as a locked or electric cover, approved by the Building Official

17.54.020 Projections from Buildings.

Ordinary building projections such as cornices, eaves, overhangs, canopies, sunshades, gutters, chimneys, flues, sills or similar architectural features may project into the required yards up to twenty-four inches.

17.54.030 Setback Exceptions.

Through lots having a frontage on two streets shall provide the required front yard on each street. The required rear yard is not necessary. (Prior code §11-4-3)

17.54.060 Seasonal Sales.

The following standards shall apply to seasonal outdoor sales which are limited to:
A. Fireworks Sales. The annual season for fireworks sales shall commence no sooner than June 23 and continue

no longer than July 5.A business license shall be required pursuant to Title 5 of this code.

B. Christmas Tree and Wreath Sales. The annual season for Christmas tree and wreath sales shall commence no sooner than the day after Thanksgiving and shall continue no later than December 26.
A business license shall be required pursuant to Title 5 of this code.

17.54.090- Accessory Dwelling Units.

An accessory dwelling unit (ADU) is defined as a self-contained residential dwelling unit located on the same lot as a single-family dwelling, but is not a recreational vehicle. The habitable living unit provides basic living requirements including permanent cooking, and toilet facilities. It may be located either within the same building as the single-family dwelling unit or in a detached building.

A. The purpose of allowing an ADU is to:
   1. Provide homeowners with a means of obtaining, through tenants in the ADU or the principle dwelling unit, rental income, companionship, security, and services.
   2. Add affordable housing units to the existing housing inventory.
   3. Make housing units available to moderate-income people who might otherwise have difficulty finding homes within the City.
   4. Develop housing units in single-family neighborhoods that are appropriate for people at a variety of stages in the life cycle.
   5. Protect neighborhood stability, property values, and the single-family residential appearance of the neighborhood by ensuring that ADUs are installed under the conditions of this Section.
B. Standards and Criteria
An ADU shall meet the following standards and criteria:

1. The design and size of the ADU shall conform to all applicable standards in the building, plumbing, electrical, mechanical, fire, health, and any other applicable codes.
2. Any additions to the existing dwelling unit shall not encroach into the existing setbacks in the underlying zone. However, access structures (e.g. stairs or ramps) may be allowed within the setback if no access can be provided to the unit without encroaching into the setback area.
3. The ADU may be attached to, or detached from, the principle dwelling unit.
4. Only one ADU may be created per lot or parcel.
5. The installation of an ADU shall be allowed in single-family zones subject to the specific development, design, and owner-occupancy standards in this section. ADUs are not permitted on the same lot as a nonconforming use.
6. The ADU shall not exceed the height of the principle dwelling unit.
7. The property owner, which shall include title holders and contract purchasers, must occupy either the principle dwelling unit or the ADU as their permanent residence, for at least 7 months out of the year, and at no time receive rent for the owner-occupied unit.
8. In no case shall an ADU:
    a. Be more than 40 percent of the principle dwelling unit's total floor area; nor
    b. Be more than 800 square feet; nor
    c. Be less than 300 square feet; nor
    d. Have more than 2 sleeping areas.
9. Detached ADUs:
    a. shall comply with the requirements OCMC Chapter 17.54.010 – Accessory Buildings and Uses including building footprint, height, placement, exterior building materials, etc.
    b. in the historic overlay district pursuant to OCMC chapter 17.40, shall be subject to the Design Guidelines for New Construction in Historic Districts.
10. The ADU shall be compatible with the principle dwelling unit, specifically in:
    a. Exterior finish materials.
        1. The exterior finish material must be the same as the principle dwelling unit; or
        2. Visually match in type, size and placement the exterior finish material of the principle dwelling unit.
    b. Trim must be the same in type, size, and location as the trim used on the principle dwelling unit
    c. Windows must match those in the principle dwelling unit in proportion (relationship of width to height) and orientation (horizontal or vertical).
    d. Eaves must project from the building walls at the same proportion as the eaves on the principle dwelling unit.
11. Parking.
    a. Purpose. The parking requirements balance the need to provide adequate parking while maintaining the character of single-dwelling neighborhoods and reducing the amount of impervious surface on a site.
    b. The following parking requirements apply to accessory dwelling units.
        1. No additional parking space is required for the accessory dwelling unit if it is created on a site with a principle dwelling unit and the roadway for at least one abutting street is at least 28 feet wide.
        2. One additional parking space is required for the accessory dwelling unit as follows:
        i. When none of the roadways in abutting streets are at least 28 feet wide; or
        ii. When the accessory dwelling unit is created at the same time as the Principle Dwelling Unit.

C. Application Procedure

Application for a building permit for an ADU shall be made to the building official in accordance with the permit procedures established in OCMC 15.12, and shall include:

1. A letter of application from the owner(s) stating that the owner(s) shall occupy one of the dwelling units on the premises, except for bona fide temporary absences, for 7 months out of each year.

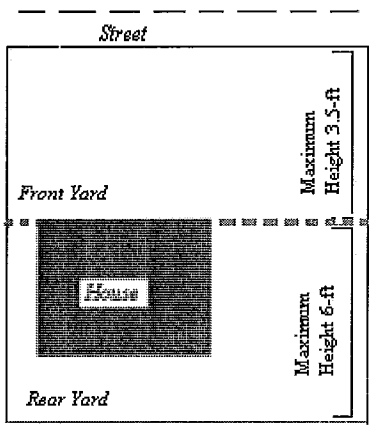
2. The registration application or other forms as required by the building official shall be filed as a deed restriction with Clackamas County Records Division to indicate the presence of the ADU, the requirement of owner-occupancy, and other standards for maintaining the unit as described above.
3. The building official shall report annually to the Community Development Director on ADU registration with the number of units and distribution throughout the City.
4. Cancellation of an ADU's registration may be accomplished by the owner filing a certificate with the building official for recording at the Clackamas County Records Division, or may occur as a result of enforcement action.

17.54.100 Fences.

Fence, Setback and Height Limitations
A fence may be located on the property or in a yard setback area subject to the following:

Any fence, hedge or wall located in front of your home may be up to 3.5-feet in total height.

fence, hedge or wall located next to and behind your home may be up to 6-feet in total height.



A. Generally. Fence, hedge, or wall.
   1. Fences and walls – Fences and walls over 42 inches shall not be located in front of the front faced or within 40 feet of the public right-of-way, whichever is less. All other fences (including fences along the side and rear of a property) shall not exceed 6 feet in total height unless as permitted in 17.54.100, Section (B).
   2. Hedges shall not be more than 42-inches in the underlying front yard setback
   3. Property owners shall ensure compliance with the Traffic Sight Obstruction requirements in Chapter 10.32 of the Oregon City Municipal Code.
   4. It is unlawful for any person to erect any electric fence or any fence constructed in whole or in part of barbed wire or to use barbed wire, except as erected in connection with security installations at a minimum height of six feet, providing further that prior written approval has been granted by the City Manager.
B. Exception. Fence, hedge, wall, or other obstructing vegetation on retaining wall. When a fence, hedge, wall, or other obstructing vegetation is built on a retaining wall or an artificial berm that is not adjacent to or abutting a public right-of-way, the following standards shall apply:
   1. When the retaining wall or artificial berm is 30 inches or less in height from the finished grade, the maximum fence or wall height on top of the retaining wall shall be six feet.
   2. When the retaining wall or earth berm is greater than 30 inches in height, the combined height of the retaining wall and fence or, wallfrom finished grade shall not exceed 8 ½ feet.
   3. Fences, hedges or walls located on top of retaining walls or earth bermsin excess of 8 ½ feet in height shall be setback a minimum of 2 feet from the edge of the retaining wall or earth berm below and shall not exceed a combined height of 8 ½ feet.

4. An alternative height or location requirement may be approved within a land use process for all non-single-family and two-family residential properties. The fence, hedge or wall shall be compatible with the adjacent neighborhood and achieve the same intent of the zoning designation and applicable Site Plan and Design Review process. In no case may the fence, hedge or wall exceed 8 feet in height without approval of a variance.

17.54.105 Live/Work Units.

Live/work units provide important flexibility by combining residential and commercial uses and allowing for commercial uses on the ground floor when the market is ready to support them. These standards apply to all new live/work units. Live/work units that conform to the standards will be approved as a Type II Decision and a Live/work Permit will be granted for the property. For all zones were live/work units are permitted, the following standards shall apply. Conditions of approval may be implemented to ensure compliance with the standards.

A. The ground floor business has visibility, signage and access from the primary street. The building in which the live work dwelling is located shall architecturally differentiate the ground floor commercial/office space from the rest of the building by meet the following requirements:

1. The main front elevation shall provide at least fifty percent transparency at the pedestrian level through the use of a storefront system. The transparency is measured in lineal fashion (For example, a twenty-five foot long building elevation shall have at least twelve a half feet (50% of 25 feet) of transparency in length).
2. Windows shall begin 13 to 30 inches above the sidewalk rather than continue down to street level. Large single paned windows over 10 feet in width shall be divided into multiple panes to add human scale by dividing the vertical plane into smaller parts.
3. Highly reflective or glare-producing glass with a reflective factor of .25 or greater is prohibited on all building facades. Any glazing materials shall have a maximum fifteen (15) percent outside visual light reflectivity value. No exception shall be made for reflective glass styles that appear transparent when internally illuminated.

B. A live/work dwelling is allowed instead of, or in addition to, a home occupation as defined by OCMC 17.04. The business portion of the dwelling shall be limited to the ground floor and may not exceed 50 percent of the square footage of the entire dwelling, excluding the garage or 1000 square feet whichever is the smaller number.

C. The primary entrance to the business must be located on the primary street frontage. Alley access is required to provide refuse and recycling service and residential parking. If alley access cannot be provided an alternative parking and refuse and recycling service plan may be approved by the Community Development Director if it meets the intent of the standards.

D. The applicant must show that there is adequate on street or off-street parking for the proposed use. One parking space is required for every 500 square feet of commercial, personal service, or office use or a portion thereof. For example, 700 square feet of commercial use requires 2 parking spaces. Adequate parking can be shown by meeting one of the following:

1. Shared Parking. Required parking may be satisfied by the same parking facilities used jointly, to the extent that the owners or operators show that the need for parking facilities does not materially overlap (e.g., uses primarily of a daytime versus nighttime nature) or the live/work use is utilizing a parking space that is above the minimum parking requirement of the shared use, and that the shared parking facility is within 1,000 feet of the potential uses, and provided that the right of joint use is evidenced by a recorded deed, lease, contract, or similar written instrument establishing the joint use.
2. On-Street Parking. On-street parking dimensions for livework units shall conform to the standards set forth in OCMC 17.52010C
3. Onsite Parking. Parking spaces are provided onsite and meet the requirements of OCMC 17.52.-Offstreet Parking and Loading.

E. The number of employees permitted onsite for employment purposes shall be limited to 5 persons at one time.
F. The location of lots where live/work dwellings may be sited shall be specified on the subdivision plat (if applicable) and a deed restriction shall be placed on all units describing the restrictions placed upon these units These include, but are not limited to, the following:
    1. The work use shall not generate noise exceeding 55-decibel level as measured at the lot line of the lot containing the live/work dwelling.
    2. No outside storage of materials or goods related to the work occupation or business shall be permitted. Solid waste associated with the work use shall be stored inside the building and can be set out no more than 4 hours before the solid waste pickup.
    3. No dust or noxious odor shall be evident off the premises.
    4. If the business is open to the public, public access must be through the front door and the business may not be open to clients or the public before 7:00 a.m. or after 8:00 p.m.

Oregon City Municipal Code
Chapter 17.62 SITE PLAN & DESIGN REVIEW

17.62.010 Purpose.

The purposes of site plan and design review are to: encourage site planning in advance of construction; protect lives and property from potential adverse impacts of development; consider natural or man-made hazards which may impose limitations on development; conserve the city's natural beauty and visual character and minimize adverse impacts of development on the natural environment as much as is reasonably practicable; assure that development is supported with necessary public facilities and services; ensure that structures and other improvements are properly related to their sites and to surrounding sites and structure; and implement the city's comprehensive plan and land use regulations with respect to development standards and policies.

17.62.015 Modifications That Will Better Meet Design Review Requirements.

The review body may consider modification of site-related development standards. These modifications are done as part of design review and are not required to go through the Variance process pursuant to section 17.60.020. Adjustments to use-related development standards (such as floor area ratios, intensity of use, size of the use, number of units, or concentration of uses) are required to go through the Variance process pursuant to section 17.60.020. Modifications that are denied through design review may be requested as Variance through the Variance process pursuant to section 17.60.020. The review body may approve requested modifications if it finds that the applicant has shown that the following approval criteria are met:

A. The modification will result in a development that better meets design guidelines; and

B. The modification meets the intent of the standard. On balance, the proposal will be consistent with the purpose of the standard for which a modification is requested.

17.62.030 When Required.

Site plan and design review shall be required for all development of real property in all zones except the R-10, R-8, R-6, R-5 and R-3.5 zoning districts, unless otherwise provided for by this title or as a condition of approval of a permit. Site plan and design review shall also apply to all conditional uses, cottage housing development, multi-family and non-residential uses in all zones. No building permit or other permit authorization for development shall be issued prior to site plan and design review approval. Parking lots and parking areas accessory to uses regulated by this chapter also shall require site plan and

design review approval. Site plan and design review shall not alter the type and category of uses permitted in zoning districts.

17.62.035 Minor Site Plan and Design Review.

This section provides for a minor site plan and design review process. Minor Site Plan Review is a Type II decision subject to administrative proceedings described in OCMC 17.50 section and may be utilized as the appropriate review process only when authorized by the Community Development Director. The purpose of this type of review is to expedite design review standards for uses and activities that require only a minimal amount of review, typical of minor modifications and/or changes to existing uses or buildings.

A. Generally. Minor site plan and design review applies to the following uses and activities:

1. Modification of an office, commercial, industrial, institutional, public or multi-family structure for the purpose of enhancing the aesthetics of the building and not increasing the interior usable space (for example covered walkways or entryways, addition of unoccupied features such as clock tower, etc.).

2. Modification to parking lot layout and landscaping or the addition of up to 5 parking spaces.

3. A maximum addition of up to one thousand square feet to a commercial, office, institutional, public, multi-family, or industrial building provided that the addition is not more than thirty-five percent of the original building square footage.

4. Other land uses and activities may be added if the Community Development Director makes written findings that the activity/use will not increase off-site impacts and is consistent with the type and/or scale of activities/uses listed above.

B. Application. The application for the minor site plan and design review shall contain the following elements:

1. The submittal requirements of Chapter 17.50.

2. A narrative explaining all aspects of the proposal in detail and addressing each of the criteria listed in Section 17.62.035(C) below.

3. Site plan drawings showing existing conditions/uses and proposed conditions/uses.

4. Architectural drawings, including building elevations and envelopes, if architectural work is proposed.

5. Additional submittal material may be required by the Community Development Director on a case-by-case basis.

C. Development Standards for Minor Site Plan and Design Review.

1. All development shall comply with Section 17.62.050(1-7and 8-15 and 20-22) when deemed applicable by the Community Development Director. Other sections may apply, as directed by the Community Development Director when applicable, in order to show compliance with this chapter, such as the commercial and institutional standards of section 17.62.055

17.62.040 Plans Required.

A complete application for site plan and design review shall be submitted. Except as otherwise in subsection I of this section, the application shall include the following plans and information:

A. A site plan or plans, to scale, containing the following:

1. Vicinity information showing streets and access points, pedestrian and bicycle pathways, transit stops and utility locations;

2. The site size, dimensions, and zoning, including dimensions and gross area of each lot or parcel and tax lot and assessor map designations for the proposed site and immediately adjoining properties;

3. Contour lines at two foot contour intervals for grades zero to ten percent, and five-foot intervals for grades over ten percent;

4. The location of natural hazard areas on and within one hundred feet of the boundaries of the site, including:

   a. Areas indicated on floodplain maps as being within the one hundred-year floodplain,

   b. Unstable slopes, as defined in Section 17.44.020,

   c. Areas identified on the seismic conditions map in the comprehensive plan as subject to earthquake and seismic conditions;

5. The location of natural resource areas on and within one hundred feet of the boundaries of the site, including fish and wildlife habitat, existing trees (six inches or greater in caliper measured four feet above ground level), wetlands, streams, natural areas, wooded areas, areas of significant trees or vegetation, and areas designated as being within the natural resources overlay district;

6. The location of inventoried historic or cultural resources on and within one hundred feet of the boundaries of the site;

7. The location, dimensions, and setback distances of all existing permanent structures, improvements and utilities on or within twenty-five feet of the site, and the current or proposed uses of the structures;

8. The location, dimensions, square footage, building orientation and setback distances of proposed structures, improvements and utilities, and the proposed uses of the structures by square footage;

9. The location, dimension and names, as appropriate, of all existing and platted streets, other public ways, sidewalks, bike routes and bikeways, pedestrian/bicycle accessways and other pedestrian and bicycle ways, transit street and facilities, neighborhood activity centers, and easements on and within two hundred fifty feet of the boundaries of the site;

10. The location, dimension and names, as appropriate, of all proposed streets, other public ways, sidewalks, bike routes and bikeways, pedestrian/bicycle accessways and other pedestrian and bicycle ways, transit streets and facilities, neighborhood activity centers, and easements on and within two hundred fifty feet of the boundaries of the site;

11. All parking, circulation, loading and servicing areas, including the locations of all carpool, vanpool and bicycle parking spaces as required in Chapter 52 of this title;

12. Site access points for automobiles, pedestrians, bicycles and transit;

13. On-site pedestrian and bicycle circulation;

14. Outdoor common areas proposed as open space;

15. Total impervious surface created (including buildings and hard ground surfaces).

16. The proposed location, dimensions and materials of fences and walls.

B. A landscaping plan, drawn to scale, showing the location and types of existing trees (six inches or greater in caliper measured four feet above ground level) and vegetation proposed to be removed and to be retained on the site, the location and design of landscaped areas, the varieties, sizes and spacings of trees and plant materials to be planted on the site, other pertinent landscape features, and irrigation systems required to maintain plant materials.

C. Architectural drawings or sketches, drawn to scale and showing floor plans, elevations accurately reflected to grade, and exterior materials of all proposed structures and other improvements as they will appear on completion of construction.

D. A materials board, no larger size than eleven inches by seventeen inches clearly depicting all building materials with specifications as to type, color and texture of exterior materials of proposed structures. An electronic version may be accepted as an alternative if approved by the Community Development Director.

E. An erosion/sedimentation control plan, in accordance with the requirements of Chapter 17.47 and the Public Works Erosion and Sediment Control Standards, and a drainage plan developed in accordance with city drainage master plan requirements, Chapter 13.12 and the Public Works Stormwater and Grading Design Standards. The drainage plan shall identify the location of drainage patterns and drainage courses on and within one hundred feet of the boundaries of the site. Where development is proposed within an identified hazard area, these plans shall reflect concerns identified in the hydrological/geological/ geotechnical development impact statement.

F. The legal description of the site.

G. An exterior lighting plan, drawn to scale, showing type, height, and area of illumination.

H. Archeological Monitoring Recommendation. For all projects that will involve ground disturbance, the applicant shall provide,

1. A letter or email from the Oregon State Historic Preservation Office Archaeological Division indicating the level of recommended archeological monitoring on-site, or demonstrate that the applicant had notified the Oregon State Historic Preservation Office and that the Oregon State Historic Preservation Office had not commented within 45 days of notification by the applicant; and

2. A letter or email from the applicable tribal cultural resource representative of the Confederated Tribes of the Grand Ronde, Confederated Tribes of the Siletz, Confederated Tribes of the Umatilla, Confederated Tribes of the Warm Springs and the Confederated Tribes of the Yakama Nation indicating the level of recommended archeological monitoring on-site, or demonstrate that the applicant had notified the applicable tribal cultural resource representative and that the applicable tribal cultural resource representative had not commented within 45 days of notification by the applicant.

If, after 45 days notice from the applicant, the Oregon State Historic Preservation Office or the applicable tribal cultural resource representative fails to provide comment, the city will not require the letter or email as part of the completeness review. For the purpose of this section, ground disturbance is defined as the movement of native soils.

I. Such special studies or reports as the Community Development Director may require to obtain information to ensure that the proposed development does not adversely affect the surrounding community or identified natural resource areas or create hazardous conditions for persons or improvements on the site. The Community Development Director shall require an applicant to submit one or more development impact statements, as described in Section 16.12.050, upon determination that (1) there is a reasonable likelihood that traffic safety or capacity improvements may be required; (2) the proposal could have significant adverse impacts on identified natural resource areas, including areas designated as being within the natural resources overlay district; or (3) the proposal would be located on or could have significant adverse impacts on natural hazard areas, including the geologic hazard and flood plain overlay districts. The Community Development Director shall determine which types of development impact statements are necessary and provide written reasons for requiring the statement(s). The development impact statements shall include the information described in Sections 16.12.070, 16.12.080, and 16.12.120. 17.62.040

J. The Community Development Director may waive the submission of information for specific requirements of this section or may require information in addition to that required by a specific provision of this section, as follows:

1. The Community Development Director may waive the submission of information for a specific requirement upon determination either that specific information is not necessary to evaluate the

application properly, or that a specific approval standard is not applicable to the application. If submission of information is waived, the Community Development Director shall, in the decision, identify the waived requirements, explain the reasons for the waiver, and state that the waiver may be challenged on appeal and may be denied by a subsequent review authority. If the matter is forwarded to the planning commission for initial review, the information required by this paragraph shall be included in the staff report;

2. The Community Development Director may require information in addition to that required by a specific provision of this section upon determination that the information is needed to evaluate the application properly and that the need can be justified on the basis of a special or unforseen circumstance. If additional information is required, the Community Development Director shall, in the decision, explain the reasons for requiring the additional information.

K.. If the applicant has not already done so as some other part of the land use review process, the applicant shall submit an erosion control plan that complies with the applicable requirements of Chapter 17.74 of this code.

17.62.050 Standards.

A. All development shall comply with the following standards:

1. Landscaping, A minimum of fifteen percent of the lot shall be landscaped. Existing native vegetation shall be retained to the maximum extent practicable. All plants listed on the Oregon City Nuisance Plant List shall be removed from the site prior to issuance of a final occupancy permit for the building.

a. Except as allowed elsewhere in the Zoning and Land Division Chapters of this code, all areas to be credited towards landscaping must be installed with growing plant materials. A reduction of up to 25% of the overall required landscaping may be approved by the Community Development Director if the same or greater amount of pervious material is incorporated in the non-parking lot portion of the site plan (pervious material within parking lots are regulated in OCMC 17.52.070) .
b. Pursuant to Chapter 17.49, landscaping requirements within the Natural Resource Overlay District, other than landscaping required for parking lots, may be met by preserving, restoring and permanently protecting native vegetation and habitat on development sites.
c. The landscaping plan shall be prepared by a registered landscape architect and include a mix of vertical (trees and shrubs) and horizontal elements (grass, groundcover, etc.) that within 3 years will cover 100% of the Landscape area. No mulch, bark chips, or similar materials shall be allowed at the time of landscape installation except under the canopy of shrubs and within two feet of the base of trees. The Community Development Department shall maintain a list of trees, shrubs and vegetation acceptable for landscaping.
d. For properties within the Downtown Design District, or for major remodeling in all zones subject to this chapter, landscaping shall be required to the extent practicable up to the ten percent requirement.
e. Landscaping shall be visible from public thoroughfares to the extent practicable.
f. Interior parking lot landscaping shall not be counted toward the fifteen percent minimum, unless otherwise permitted by the dimensional standards of the underlying zone district.

2. Vehicular Access and Connectivity
a. Parking areas shall be located behind buildings, below buildings, or on one or both sides of buildings.
b. Ingress and egress locations on public thoroughfares shall be located in the interest of public safety. Access for emergency services (fire and police) shall be provided.
c. Alleys or vehicular access easements shall be provided in the following Districts: R-2, MUC-1, MUC-2, MUD and NC zones unless other permanent provisions for access to off-street parking and loading facilities are approved by the decision-maker. The corners of alley intersections shall have a radius of not less than ten feet.
d. Sites abutting an alley shall be required to gain vehicular access from the alley unless deemed impracticable by the Community Development Director.

e. Where no alley access is available, the development shall be configured to allow only one driveway per frontage. On corner lots, the driveway(s) shall be located off of the side street (unless the side street is an arterial) and away from the street intersection. Shared driveways shall be required as needed to accomplish the requirements of this section. The location and design of pedestrian access from the public sidewalk shall be emphasized so as to be clearly visible and distinguishable from the vehicular access to the site. Special landscaping, paving, lighting, and architectural treatments may be required to accomplish this requirement

f. Development shall be required to provide existing or future connections to adjacent sites through the use of a vehicular and pedestrian access easements where applicable.

g.Parking garage entries (both individual, private and shared parking garages) shall not dominate the streetscape. They shall be designed and situated to be ancillary to the use and architecture of the ground floor. This standard applies to both public garages and any individual private garages, whether they front on a street or private interior access road.
h. Buildings containing above-grade structured parking shall screen such parking areas with landscaping or landscaped berms, or incorporate contextual architectural elements that

complement adjacent buildings or buildings in the area. Upper level parking garages shall use articulation or fenestration treatments that break up the massing of the garage and/or add visual interest.

3. Building structures shall be complimentary to the surrounding area. All exterior surfaces shall present a finished appearance. All sides of the building shall include materials and design characteristics consistent with those on the front. Use of inferior or lesser quality materials for side or rear facades or decking shall be prohibited.

    a. Alterations, additions and new construction located within the McLoughlin Conservation District, Canemah National Register District, and the Downtown Design District and when abutting a designated Historic Landmark shall utilize materials and a design that incorporates the architecture of the subject building as well as the surrounding district or abutting Historic Landmark. Historic materials such as doors, windows and siding shall be retained or replaced with in kind materials unless the Community Development Director determines that the materials cannot be retained and the new design and materials are compatible with the subject building, and District or Landmark. The Community Development Director may utilize the Historic Review Board's Guidelines for New Constriction (2006) to develop findings to show compliance with this section.
    b. In historic areas and where development could have a significant visual impact, the review authority may request the advisory opinions of appropriate experts designated by the Community Development Director from the design fields of architecture, landscaping and urban planning. The applicant shall pay the costs associated with obtaining such independent professional advice; provided, however, that the review authority shall seek to minimize those costs to the extent practicable.

4. Grading shall be in accordance with the requirements of Chapter 15.48 and the public works stormwater and grading design standards.

5. Development subject to the requirements of the Geologic Hazard overlay district shall comply with the requirements of that district.

6. Drainage shall be provided in accordance with city's drainage master plan, Chapter 13.12, and the public works stormwater and grading design standards.

7. Parking, including carpool, vanpool and bicycle parking, shall comply with city off-street parking standards, Chapter 17.52.

8. Sidewalks and curbs shall be provided in accordance with the city's transportation master plan and street design standards. Upon application, the Community Development Director may waive this requirement in whole or in part in those locations where there is no probable need, or comparable alternative location provisions for pedestrians are made.

9. A well-marked, continuous and protected on-site pedestrian circulation system meeting the following standards shall be provided:

    a. Pathways between all building entrances and the street are required. Pathways between the street and buildings fronting on the street shall be direct. Exceptions may be allowed by the Director where steep slopes or protected natural resources prevent a direct connection or where an indirect route would enhance the design and/or use of a common open space.

b. The pedestrian circulation system shall connect all main entrances on the site. For buildings fronting on the street, the sidewalk may be used to meet this standard. Pedestrian connections to other areas of the site, such as parking areas, recreational areas, common outdoor areas, and any pedestrian amenities shall be required.
c. Elevated external stairways or walkways, that provide pedestrian access to multiple dwelling units located above the ground floor of any building are prohibited. The Community Development Director may allow exceptions for external stairways or walkways located in, or facing interior courtyard areas provided they do not compromise visual access from dwelling units into the courtyard.
d. The pedestrian circulation system shall connect the main entrances of adjacent buildings on the same site.
e. The pedestrian circulation system shall connect the principal building entrance to those of buildings on adjacent commercial and residential sites where practicable. Walkway linkages to adjacent developments shall not be required within industrial developments or to industrial developments or to vacant industrially-zoned land.
f. On-site pedestrian walkways shall be hard surfaced, well drained and at least five feet wide. Surface material shall contrast visually to adjoining surfaces. When bordering parking spaces other than spaces for parallel parking, pedestrian walkways shall be a minimum of seven feet in width unless curb stops are provided. When the pedestrian circulation system is parallel and adjacent to an auto travel lane, the walkway shall be raised or separated from the auto travel lane by a raised curb, bollards, landscaping or other physical barrier. If a raised walkway is used, the ends of the raised portions shall be equipped with curb ramps for each direction of travel. Pedestrian walkways that cross drive isles or other vehicular circulation areas shall utilize a change in textual material or height to alert the driver of the pedestrian crossing area.

10. There shall be provided adequate means to ensure continued maintenance and necessary normal replacement of private common facilities and areas, drainage ditches, streets and other ways, structures, recreational facilities, landscaping, fill and excavation areas, screening and fencing, groundcover, garbage storage areas and other facilities not subject to periodic maintenance by the city or other public agency.

11. Site planning shall conform to the requirements of OCMC Chapter 17.41 Tree Protection

12. Development shall be planned, designed, constructed and maintained to protect water resources and habitat conservation areas in accordance with the requirements of the city's Natural Resources Overlay District, Chapter 17.49, as applicable.

13. All development shall maintain continuous compliance with applicable federal, state, and city standards pertaining to air and water quality, odor, heat, glare, noise and vibrations, outdoor storage, radioactive materials, toxic or noxious matter, and electromagnetic interference. Prior to issuance of a building permit, the Community Development Director or building official may require submission of evidence demonstrating compliance with such standards and receipt of necessary permits. The review authority may regulate the hours of construction or operation to minimize adverse impacts on adjoining residences, businesses or neighborhoods. The emission of odorous gases or other matter in such quantity as to be readily detectable at any point beyond the property line of the use creating the odors or matter is prohibited.

14. Adequate public water and sanitary sewer facilities sufficient to serve the proposed or permitted level of development shall be provided. The applicant shall demonstrate that adequate facilities

and services are presently available or can be made available concurrent with development. Service providers shall be presumed correct in the evidence, which they submit. All facilities shall be designated to city standards as set out in the city's facility master plans and public works design standards. A development may be required to modify or replace existing offsite systems if necessary to provide adequate public facilities. The city may require over sizing of facilities where necessary to meet standards in the city's facility master plan or to allow for the orderly and efficient provision of public facilities and services. Where over sizing is required, the developer may request reimbursement from the city for over sizing based on the city's reimbursement policy and fund availability, or provide for recovery of costs from intervening properties as they develop.

15. Adequate right-of-way and improvements to streets, pedestrian ways, bike routes and bikeways, and transit facilities shall be provided and be consistent with the city's transportation master plan and design standards and this title. Consideration shall be given to the need for street widening and other improvements in the area of the proposed development impacted by traffic generated by the proposed development. This shall include, but not be limited to, improvements to the right-of-way, such as installation of lighting, signalization, turn lanes, median and parking strips, traffic islands, paving, curbs and gutters, sidewalks, bikeways, street drainage facilities and other facilities needed because of anticipated vehicular and pedestrian traffic generation.

    When approving land use actions, Oregon City requires all relevant intersections to be maintained at the minimum acceptable level of service (LOS) upon full build-out of the proposed land use action. The minimum acceptable LOS standards are as follows:

    a. For signalized intersection areas of the city that are located outside the Regional Center boundaries a LOS of "D" or better for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of critical movements.

    b. For signalized intersections within the Regional Center boundaries a LOS "D" can be exceeded during the peak hour; however, during the second peak hour, LOS "D" or better will be required as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0.

    c. For unsignalized intersection throughout the city a LOS "E" or better for the poorest approach and with no movement serving more than twenty peak hour vehicles operating at worse than LOS "F" will be tolerated for minor movements during a peak hour.

16. If Tri-Met, upon review of an application for an industrial, institutional, retail or office development, recommends that a bus stop, bus turnout lane, bus shelter, bus landing pad or transit stop connection be constructed at the time of development, the review authority shall require such improvement, using designs supportive of transit use

17. All utility lines shall be placed underground.

18. Access and facilities for physically handicapped people shall be incorporated into the site and building design consistent with applicable federal and state requirements, with particular attention to providing continuous, uninterrupted access routes.

19. For a residential development, site layout shall achieve at least eighty percent of the maximum density of the base zone for the net developable area. Net developable area excludes all areas for required right-of-way dedication, land protected from development through Natural Resource or Geologic Hazards protection, and required open space or park dedication.

20. Screening of Mechanical Equipment:
    a. Rooftop mechanical equipment, including HVAC equipment and utility equipment that serves the structure, shall be screened. Screening shall be accomplished through the use of parapet walls or a sight-obscuring enclosure around the equipment constructed of one of the primary materials used on the primary facades of the structure, and that is an integral part of the building's architectural design. The parapet or screen shall completely surround the rooftop mechanical equipment to an elevation equal to or greater than the highest portion of the rooftop mechanical equipment being screened. In the event such parapet wall does not fully screen all rooftop equipment, then the rooftop equipment shall be enclosed by a screen constructed of one of the primary materials used on the primary facade of the building so as to achieve complete screening.
    b. Wall-mounted mechanical equipment shall not be placed on the front facade of a building or on a facade that faces a right-of-way. Wall-mounted mechanical equipment, including air conditioning or HVAC equipment and groups of multiple utility meters, that extends six inches or more from the outer building wall shall be screened from view from streets; from residential, public, and institutional properties; and from public areas of the site or adjacent sites through the use of (a) sight-obscuring enclosures constructed of one of the primary materials used on the primary facade of the structure, (b) sight-obscuring fences, or (c) trees or shrubs that block at least 80 percent of the equipment from view or (d) painting the units to match the building. Wall-mounted mechanical equipment that extends six inches or less from the outer building wall shall be designed to blend in with the color and architectural design of the subject building.
    c. Ground-mounted above-grade mechanical equipment shall be screened by ornamental fences, screening enclosures, trees, or shrubs that block at least 80 percent of the viewl. Placement and type of screening shall be determined by the Community Development Director..
    d. All mechanical equipment shall comply with the standards in this section. If mechanical equipment is installed outside of the Site Plan and Design Review process, planning staff shall review the plans to determine if additional screening is required. If the proposed screening meets this section, no additional Planning review is required.
    e. This section shall not apply to the installation of solar energy panels, photovoltaic equipment or wind power generating equipment.

21. Building Materials

a. Preferred building materials. Building exteriors shall be constructed from high quality, durable materials. Preferred exterior building materials that reflect the City's desired traditional character are as follows:

    i. Brick.
    ii. Basalt stone or basalt veneer
    iii. Narrow horizontal wood or composite siding (generally 5 inches wide or less); wider siding will be considered where there is a historic precedent.
    iv. Board and baton siding
    v. Other materials subject to approval by the Community Development Director.

vi. Plywood with battens or fiber/composite panels with concealed fasteners and contagious aluminum sections at each joint that are either horizontally or vertically aligned.
vii. Stucco shall be trimmed in wood, masonry, or other approved materials and shall be sheltered from extreme weather by roof overhangs or other methods.

b. Prohibited materials. The following materials shall be prohibited in visible locations unless an exception is granted by the Community Development Director based on the integration of the material into the overall design of the structure.

i. Vinyl or plywood siding(including T-111 or similar plywood).
ii. Glass block or highly tinted, reflected, translucent or mirrored glass (except stained glass) as more than 10 percent of the building façade
iii. Corrugated fiberglass.
iv. Chain link fencing (except for temporary purposes such as a construction site or as a
v. gate for a refuse enclosure).
vi. Crushed colored rock/crushed tumbled glass.
vii. Non-corrugated and highly reflective sheet metal.

c. Special material standards: The following materials are allowed if they comply with the requirements found below:

1. Concrete block. When used for the front façade of any building, concrete blocks shall be split, rock- or ground-faced and shall not be the prominent material of the elevation. Plain concrete block or plain concrete may be used as foundation material if the foundation material is not revealed more than 3 feet above the finished grade level adjacent to the foundation wall.
2. Metal siding. Metal siding shall have visible corner moldings and trim and incorporate masonry or other similar durable/permanent material near the ground level (first two feet above ground level).
3. Exterior Insulation and Finish System (EIFS) and similar troweled finishes shall be trimmed in wood, masonry, or other approved materials and shall be sheltered from extreme weather by roof overhangs or other methods.
4. Building surfaces shall be maintained in a clean condition and painted surfaces shall be maintained to prevent or repair peeling, blistered or cracking paint.

22. Conditions of Approval. The review authority may impose such conditions as it deems necessary to ensure compliance with these standards and other applicable review criteria, including standards set out in city overlay districts, the city's master plans, and city public works design standards. Such conditions shall apply as described in Sections 17.50.310, 17.50.320 and 17.50.330. The review authority may require a property owner to sign a waiver of remonstrance against the formation of and participation in a local improvement district where it deems such a waiver necessary to provide needed improvements reasonably related to the impacts created by the proposed development. To ensure compliance with this chapter, the review authority may require an applicant to sign or accept a legal and enforceable covenant, contract, dedication, easement, performance guarantee, or other document, which shall be approved in form by the city attorney.

17.62.055 Institutional and Commercial Building Standards.

A. Purpose. The primary objective of the regulations contained in this section is to provide a range of design choices that promote creative, functional, and cohesive development that is compatible with surrounding areas. Buildings approved through this process are intended to serve multiple tenants over the life of the building, and are not intended for a one-time occupant. The standards encourage people to spend time in the area, which also provides safety though informal surveillance. Finally, this section is intended to promote the design of an urban environment that is built to human scale by creating buildings and streets that are attractive to pedestrians, create a sense of enclosure, provide activity and interest at the intersection of the public and private spaces , while also accommodating vehicular movement.

B. Applicability. In addition to Section 17.62.050 requirements, institutional and commercial buildings shall comply with design standards contained in this section.

C. Relationship between zoning district design standards and requirements of this section.

1. Building design shall contribute to the uniqueness of the underlying zoning district by applying appropriate materials, elements, features, color range and activity areas tailored specifically to the site and its context.

2. A standardized prototype or franchise design shall be modified if necessary to meet the provisions of this section.

3. In the case of a multiple building development, each individual building shall include predominant characteristics, architectural vocabulary and massing shared by all buildings in the development so that the development forms a cohesive place within the underlying zoning district or community.

4. With the exception of standards for building orientation and building front setbacks, in the event of a conflict between a design standard in this section and a standard or requirement contained in the underlying zoning district, the standard in the zoning district shall prevail.

5. On sites with 100 feet or more of frontage at least 60 percent of the site frontage width shall be occupied by buildings placed within five feet of the property line, unless a greater setback is accepted under the provisions of 17.62.055(D). For sites with less than 100 feet of street frontage, at least 50 percent of the site frontage width shall be occupied by buildings placed within five feet of the property line unless a greater setback is accepted under the provisions of 17.62.055(D),

D. Relationship of Buildings to Streets and Parking.

1. Buildings shall be placed no farther than five feet from the front property line. A larger front yard setback may be approved through site plan and design review if the setback area incorporates at least one element from the following list for every 5 feet of increased setback requested:
   a. Tables, benches or other approved seating area
   b. Cobbled, patterned or paved stone or enhanced concrete
   c. Pedestrian scale lighting
   d. Sculpture / public art

e. Fountains / Water feature
f. At least 20 square feet of landscaping or planter boxes for each tenant façade fronting on the activity area
g. Outdoor cafe
h. Enhanced landscaping or additional landscaping.
i. Other elements, as approved by the Community Development Director, that can meet the intent of this section.

2. The front most architecturally significant façade shall be oriented toward the street and shall be accessed from a public sidewalk. Primary building entrances shall be clearly defined and recessed or framed by a sheltering element such as an awning, arcade or portico in order to provide shelter from the summer sun and winter weather.

3. Entryways. The primary entranceway for each commercial or retail establishment shall face the major street. The entrance may be recessed behind the property line a maximum of five feet unless a larger setback is approved pursuant to Section17.62.055.D.1 and shall be accessed from a public sidewalk. Primary building entrances shall be clearly defined, highly visible and recessed or framed by a sheltering element including at least four of the following elements, listed below.

a. Canopies or porticos;
b. Overhangs;
c. Recesses/projections;
d. Arcades;
e. Raised corniced parapets over the door;
f. Peaked roof forms;
g. Arches;
h. Outdoor patios;
i. Display windows;
j. Architectural details such as tile work and moldings which are integrated into the building structure and design;
k. Integral planters or wing walls that incorporate landscaped areas and/or places for sitting.
l. Planter boxes and street furniture placed in the right-of-way shall be approved for use according to materials, scale and type.

4. Where additional stores will be located in the large retail establishment, each such store shall have at least one exterior customer entrance, which shall conform to the same requirements. (Ord. 01-1002 §2, 2001)

5. Trellises, canopies and fabric awnings may project up to five feet into front setbacks and public rights-of-way, provided that the base is not less than eight feet at the lowest point and no higher than ten feet above the sidewalk. Awnings shall be no longer than a single storefront.

E. Corner Lots.

For buildings located at the corner of intersections, the primary entrance of the building shall be located at the corner of the building or within 25 feet of the corner of the building. Additionally, one of the following treatments shall be required:

1. Incorporate prominent architectural elements, such as increased building height or massing, cupola, turrets, or pitched roof, at the corner of the building or within 25 feet of the corner of the building.

2. Chamfer the corner of the building (i.e. cut the corner at a 45-degree angle and a minimum of 10 feet from the corner) and incorporate extended weather protection (arcade or awning), special paving materials, street furnishings, or plantings in the chamfered area.

F. Commercial First Floor Frontage.

In order to ensure that the ground floor of structures have adequate height to function efficiently for retail uses, the first floor height to finished ceiling of new infill buildings in the mixed use and neighborhood commercial districts shall be no lower than 14feet floor to floor Where appropriate, the exterior façade at the ceiling level of new structures shall include banding, a change of materials or relief which responds to the cornice lines and window location of existing buildings that abut new structures.

G. Variation in Massing

1. A single, large, dominant building mass shall be avoided in new buildings and, to the extent reasonably feasible, in development projects involving changes to the mass of existing buildings.

2. Horizontal masses shall not exceed a height: width ratio of 1:3 without substantial variation in massing that includes a change in height and projecting or recessed elements.

3. Changes in mass shall be related to entrances, the integral structure and/or the organization of interior spaces and activities and not merely for cosmetic effect.

H. Minimum Wall Articulation.

1. Facades shall add architectural interest and variety and avoid the effect of a single, long or massive wall with no relation to human size. No wall that faces a street or connecting walkway shall have a blank, uninterrupted length exceeding thirty feet without including, but not be limited to, at least two of the following:

i. Change in plane,

ii. Change in texture or masonry pattern or color,

iii. Windows, treillage with landscaping appropriate for establishment on a trellis.

iv. An equivalent element that subdivides the wall into human scale proportions.

2. Facades greater than one hundred feet in length, measured horizontally, shall incorporate wall plane projections or recesses having a depth of at least three percent of the length of the facade and extending at least twenty percent of the length of the facade. No uninterrupted length of any facade shall exceed one hundred horizontal feet.

3. Ground floor facades that face public streets shall have arcades, display windows, entry areas, awnings or other such features along no less than sixty percent of their horizontal length.

4. Building facades must include a repeating pattern that includes any one or more of the following elements:

a. Color change;

b. Texture change;

c. Material module change.

5. Facades shall have an expression of architectural or structural bays through a change in plane no less than twelve inches in width, such as an offset, reveal or projecting rib.

6. Facades shall have at least one of elements subsections (H) 4 or 5 of this section repeat horizontally. All elements shall repeat at intervals of no more than thirty feet, either horizontally or vertically.

I. Façade Transparency.

1. Transparent windows or doors facing the street are required. The main front elevation shall provide at least sixty percent (60%) windows or transparency at the pedestrian level. Facades on corner lots shall provide at least sixty percent (60%) windows or transparency on all corner-side façades. All other side elevations shall provide at least thirty percent (30%) transparency. The transparency is measured in lineal fashion. For example, a one-hundred-foot long building elevation shall have at least sixty feet (60% of 100 feet) of transparency in length. Reflective, glazed, mirrored or tinted glass is limited to ten percent (10%) of the lineal footage of windows on the street facing façade. Highly reflective or glare-producing glass with a reflective factor of .25 or greater is prohibited on all building facades. Any glazing materials shall have a maximum fifteen (15) percent outside visual light reflectivity value. No exception shall be made for reflective glass styles that appear transparent when internally illuminated.

2. Side or rear walls that face walkways may include false windows and door openings only when actual doors and windows are not feasible because of the nature of the use of the interior use of the building. False windows located within 20 feet of a Right of Way shall be utilized as display windows with a minimum display depth of 36 inches.

J. Roof Treatments.

1. All facades shall have a recognizable "top" consisting of, but not limited to:

a. Cornice treatments, other than just colored "stripes" or "bands," with integrally textured materials such as stone or other masonry or differently colored materials; or

b. Sloping roof with overhangs and brackets; or

c. Stepped parapets;

d. Special architectural features, such as bay windows, decorative roofs and entry features may project up to three feet into street rights-of-way, provided that they are not less than nine feet above the sidewalk.

2. Mixed use buildings: For flat roofs or facades with a horizontal eave, fascia, or parapet, the minimum vertical dimension of roofline modulation is the greater of two feet or 0.1 multiplied by the wall height (finish grade to top of wall). The maximum length of any continuous roofline shall be 75 feet.

3 Other roof forms consistent with the design standards herein may satisfy this standard if the individual segments of the roof with no change in slope or discontinuity are less than 40 feet in width (measured horizontally).

K. Drive-through facilities shall:
1. Be located at the side or rear of the building
2. Be designed to maximize queue storage on site.

17.62.056 Additional Standards for Large Retail Establishments.

A. This section is intended to ensure that large retail building development is compatible with its surrounding area.

B. Large retail establishment shall mean a retail building occupying more than ten thousand gross square feet of floor area.

C. In addition to Sections 17.62.050 and 17.62.055 requirements, large retail buildings shall comply with design standards contained in this section.

D. Development Standards.

1. Roofs. Roofs shall include at least two of the following features:

a. Parapets concealing flat roofs and rooftop equipment from public view. The average height of such parapets shall not exceed fifteen percent of the height of the supporting wall and such parapets shall not at any point exceed one-third of the height of the supporting wall. Such parapets shall feature three-dimensional cornice treatment;

b. Overhanging eaves, extending no less than three feet past the supporting walls;

c. Sloping roofs that do not exceed the average height of the supporting walls, with an average slope greater than or equal to one foot of vertical rise for every three feet of horizontal run and less than or equal to one foot of vertical rise for every one foot of horizontal run;

d. Three or more roof slope planes.

2. Site Design and Relationship to Surrounding Community. Retail buildings occupying more than twenty-five thousand gross square feet of floor area shall contribute to the establishment or enhancement of community and public spaces by providing at least two of the following:

a. Patio/seating area;

b. Pedestrian plaza with benches;

c. Transportation center;

d. Window shopping walkway;

e. Outdoor playground area;

f. Kiosk area, water feature;

g. Clock tower;

h. Or other such deliberately shaped area and/or a focal feature or amenity that, in the judgment of the appropriate decision maker, adequately enhances such community and public spaces.Any such areas shall have direct access to the public sidewalk network and such features shall not be constructed of materials that are inferior to the principal materials of the building and landscape.

17.62.057 Multi Family Standards

A. Purpose. The standards of this section are intended to promote high-quality multi-family residential development and construction; encourage visual variety and architectural compatibility; and promote an integrated character with Oregon City's existing neighborhoods. Specifically, the standards shall:

1. Promote architectural variety that adds visual interest to the neighborhood.
2. Reduce the apparent bulk and scale of large buildings.
3. Provide for a variety of housing types for a range of households and age groups.
4. Enhance public safety, residential streetscape and the pedestrian environment by diminishing the prominence of garages and parking areas.
5. Improve the compatibility of multi-family residential development with the residential character of surrounding neighborhoods.
6. Promote the use of durable materials that which are appropriate for multi-family residential use and which reduce long-term maintenance costs and depreciation.

B. Applicability. In addition to Section 17.62.050 requirements, all multi-family buildings shall comply with the design standards contained in this section. Cottage Housing Development shall follow OCMC 17.62.58 instead of this section.

C. Setbacks-Multi-family developments shall be placed no farther than twenty feet from the front property line. A deeper front yard setback may be approved through site plan and design review if the setback area incorporates enhanced pedestrian spaces and amenities, including but not limited to, street furniture, public art or other such deliberately shaped area and/or a feature or amenity that, in the judgment of the Community Development Director, integrates well with adjoining areas. Setbacks may also be increased in order to protect wildlife habitat and water resources pursuant to section 17.49.100(F), and trees and tree groves pursuant to and 17.41.120(A).

D. Entrances- Every building abutting a street shall have a street facing front façade. The facade shall be oriented to the street and include windows, doorways, and a structured transition from public to private areas using built elements such as porch features, arbors, low walls, trellis work and/or similar elements integrated with planting.

E. Percentage of Frontage - On sites with 100 ft. or more of street frontage at least 50 percent of the site frontage width shall be occupied by buildings placed within 20 feet from the property line, unless a greater setback is accepted under the provisions of section 17.62.057C. For sites with less than 100 ft. of street frontage, at least 40 percent of the site frontage width shall be occupied by buildings placed within 20 feet of the property line, unless a greater setback is accepted under the provisions of section 17.62.056D

F. Pedestrian Circulation

1. Pathways between dwelling units entrances and the street are required. Such pathways between the street and buildings fronting on the street shall be in a straight line. Exceptions may be allowed by the Director where steep slopes prevent a direct connection or where an indirect route would enhance the design and/or use of a common open space.

2. The pedestrian circulation system shall connect all main entrances on the site. For townhouses or other residential units fronting on the street, the sidewalk may be used to meet this standard. For multiple-family developments, pedestrian connections to other areas of the site, such as parking areas, recreational areas, common outdoor areas, and any pedestrian amenities shall be required.

3. Elevated external stairways or walkways, which provide pedestrian access to dwelling units located above the ground floor are *prohibited.* The Community Development Director may allow exceptions for external stairways or walkways located in, or facing interior *courtyard* areas provided they do not compromise visual access from dwelling units into the courtyard.

G. Architectural and Material Standards. Building articulation and modulation - multifamily residential buildings and residential portions of mixed-use buildings. An alternative to the standards in subsection G. below may be approved by the Community Development Director if the design is consistent with the intent of the standards and a specific architectural or building use exists that prohibits the full implementation of the standard.

1. Articulation and modulation of buildings is essential in providing the ability for new buildings to be compatible with the surrounding commercial and residential development. All residential buildings and residential portions of mixed-use buildings shall include at least three of the following *modulation* and/or *articulation* features at intervals of no more than 30 feet along all facades facing a street, common open space, and common parking areas:

   a. Repeating distinctive window patterns at intervals less than the required interval. Vertical building *modulation.* Minimum depth and width of *modulation* is 36 inches and 4 feet (respectively) if tied to a change in color or building material and/or roofline *modulation.* Otherwise, minimum depth of *modulation* is 10 feet and minimum width for each *modulation* is 15 feet. Balconies may not be used to meet *modulation* option unless they are recessed or projected from the facade and integrated with the building's architecture as determined by the Community Development Director, Balconies that appear to be "tacked on" to the facade will not qualify for this option.
   b. Horizontal *modulation* (upper level step-backs). The minimum horizontal *modulation* for buildings higher than 2 stories shall be 5 feet. A dormer- set 5 feet back from the front façade-is an example of an acceptable horizontal modulation.

c. *Articulation* of the building's top, middle, and bottom. This typically includes a distinctive ground floor or lower floor design, consistent *articulation* of middle floors, and a distinctive roofline.

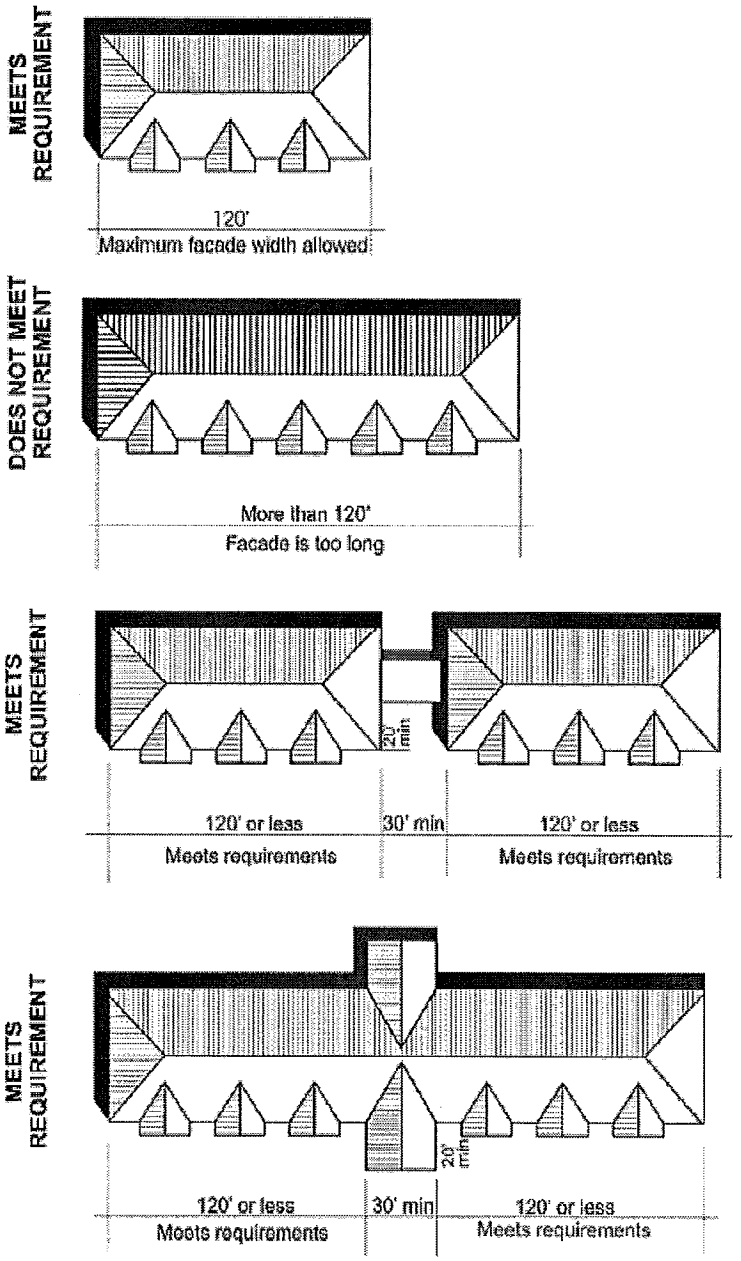




This multifamily building uses a combination of horizontal and vertical modulation, roofline modulation, distinctive window patterns, and clear articulation of the building's top, middle, and bottom to help reduce its perceived architectural scale and add visual interest.

2. Maximum façades width. Buildings visible from the street must use design techniques to break up long continuous building walls, reduce the architectural scale of the building, and add visual interest. Buildings exceeding 120 feet in width along the street front shall be divided by a 30-foot wide *modulation* of the exterior wall, so that the maximum length of a particular facade is 120 feet. Such *modulation* must be at least 20 feet or deeper and extend through all floors. Decks and roof overhangs may encroach up to 3 feet (per side) into the *modulation*. The Director will consider other design

methods that are effective at reducing the perceived width of the building. Examples could include a combination of vertical and/or horizontal building modulation with a change in building materials or finishes, a clear change in building articulation and/or fenestration technique.



3. Roofline standards.

a. Single purpose residential buildings in residential districts must provide a pitched roof with minimum 6:12 roof pitch. The maximum width of any continuous roofline shall be 35 feet for single purpose residential buildings. Alternative roof designs will be considered provided design elements are included to help the building and its roofline fit into the site's context.

b. Mixed use buildings and stand-alone residential in commercial districts shall incorporate a roofline *modulation*. Specifically: For flat roofs or facades with a horizontal eave, fascia, or parapet, the minimum vertical dimension of roofline *modulation* is the greater of two feet or 0.1 multiplied by the wall height (finish grade to top of wall). The maximum length of any continuous roofline shall be 75 feet.

c. Other roof forms consistent with the design standards herein may satisfy this standard if the individual segments of the roof with no change in slope or discontinuity are less than 40 feet in width (measured horizontally).

H. Diversity of building types. Multi-building developments of four or more buildings shall be required to provide different architectural designs to provide interest and variety. This is particularly important where multiple buildings front on the same street. Simple changes in building colors or reversal of basic facade designs are not sufficient to comply with this standard. Consider changes in vertical and/or horizontal *articulation, fenestration*, building materials, architectural style, and/or roof design.

I. Diversity of unit types. Multifamily buildings with more than 25 units are required to provide a diversity of housing types to allow for a range of households and age groups. Unit types are defined as the following:

Studio, one-bedroom, two-bedroom and three-bedroom units or an ADA accessible master bedroom and bathroom (ground floor or elevator acess).

1. Developments of 25-50 units must provide 2 unit types representing a minimum of 10 % of the total units per unit type

2. Developments of 51-75 units must provide 3 unit types representing a minimum of 10 % of the total units per unit type

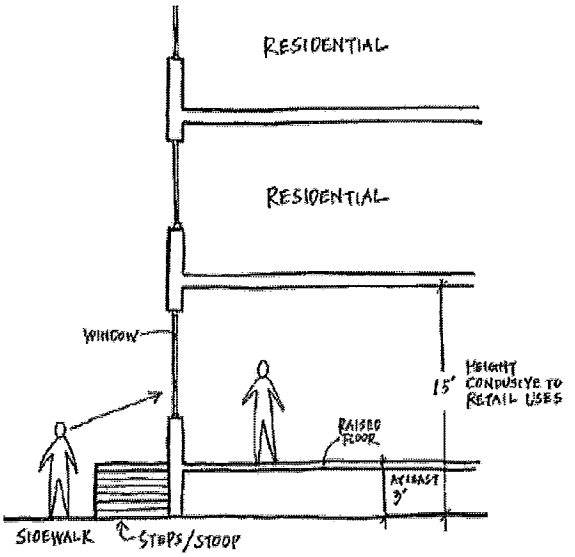
3. Developments of 76 units and above must provide 4 unit types representing a minimum of 10 % of the total units per unit type

J. Raised ground floor.
This is particularly important when dwelling units are within 15 feet of a sidewalk or common parking area

or for buildings in established neighborhoods that have an established pattern with raised dwelling units.

Where ground floor residential uses are permitted on the ground floor in commercial districts, developments

shall incorporate a 13-foot tall ground floor height to allow future conversion to commercial uses where desirable. Such projects can utilize a false floor 36 inches above the ground for residential uses to increase residents' privacy.



K. Building Materials

All multifamily buildings shall be enhanced with appropriate details. Each of the types of details listed below are worth one point. Multifamily buildings must achieve the equivalent of five points worth of architectural details.

1. Decorative porch design with distinct design and use of materials.
2. Decorative treatment of windows and doors, such as decorative molding/ framing details around all ground floor windows and doors, bay windows, decorative glazing, or door designs., and/or unique window designs.
3. Landscaped trellises or other decorative element that incorporates landscaping near the building entry or entries.
4. Decorative light fixtures with a diffuse visible light source, such as a globe or "acorn" that is non-glaring or a decorative shade or mounting for each building entry on the facade.
5. Brick or stonework covering more than 15 percent of the facade
6. Decorative building materials that add visual interest, including
    a. Individualized patterns or continuous wood details.
    b. Decorative moldings, brackets, wave trim or lattice work.
    c. Other materials with decorative or textural qualities as approved by the Director. The applicant must submit architectural drawings and material samples for approval.
7. Decorative roofline design, including multiple gables and/or dormers , decorative parapet or other design that adds distinct visual interest.
8. Decorative railings, grill work, or terraced landscape beds integrated along the façade of the building.

9. Other details that meet the intent of the guidelines as approved by the Director.

L. Window design.

1. Transparent windows or doors facing the street are required. To meet this requirement, at least 15 percent of the facade must be transparent. Transparency is measured at the 1st floor only.

2. All windows on all elevations shall recess or project individual windows at least two inches from the facade and incorporate window trim at least four inches in width that features color that contrasts with the base building color. Exceptions will be considered by the Community Development Director where buildings employ other distinctive window or facade treatment that adds visual interest to the building.

M. Common Open Space Requirements

1. Intent. Creating areas of common open space that are easily accessed by residents provides focal points for community recreation and interaction and adds to the overall quality of life for residents. Given the environmental and recreational benefits of common open space, it should be integrated purposefully into the overall design of a development and not merely be residual areas left over after buildings and parking lots are sited.

2. Common Open Space Required. All new multi-family developments in all zones except for the Mixed Use Corridor, Neighborhood Commercial or Mixed Use Downtown Districts, shall set aside a percentage of the net site acreage as common open space for the use and enjoyment of the development's residents. The common open space shall be aggregated into meaningful, quality open spaces. Clustering of buildings is encouraged to minimize small, narrow, unassigned strips in front of and between buildings. Open space areas shall be clearly identified on the development plan. Such designated common open space can be in a natural, undisturbed state, or may be landscaped for more formal courtyards or plazas, or may be developed for active or passive recreation. Phasing shall not be used to circumvent common open space standards.

3. Minimum Amount Required. The minimum amount of common open space (as a percentage of net land area) shall be: 15 percent

4. Areas Not Allowed as Part of Common Open Space. The following shall not

count toward common open space set-aside requirements:

(a) Private lots, yards, balconies and patios dedicated for use by a specific unit;

(b) Public right-of-way or private streets and drives;

(c) Open parking areas and driveways for dwellings;

(d) Land covered by structures except for ancillary structures associated with the use of the open space such as gazebos and picnic shelters or recreation building.

(e) Designated outdoor storage areas;

(f) Land areas between buildings and parking lots or driveways of less than 20 feet;

(g) Required perimeter setbacks; and

(h)Detention/retention facilities, including drainage swales, except that detention or retention areas and stormwater management structures or facilities may be used to meet up to one-hundred percent (100%) of the required common open space amount provided such areas or facilities are accessible and useable, as determined by the city, as year-round community amenities by the residents of the development (e.g., picnic areas, passive recreation areas, playgrounds, ponds for fishing and/or boating, etc.)

f. Required Greenway Linkages. Where a greenway linkage, natural or water resource area or other public park is dedicated to or acquired by the City, the area may be credited toward ½ the minimum amount of common open space required. The dedicated lands are not to be calculated in the net land area.

g. Design Criteria for Open Space. All common open space lands shall meet the following design criteria, as relevant:

2. Connectivity Required. To the maximum extent practicable, common open space shall be organized to create integrated systems of open space that connect with the following types of lands located within or adjacent to the development:

(1) Dedicated public park, greenway, or habitat lands;

(2) Dedicated school sites;

(3) Other dedicated open spaces;

(4) Common open space located adjacent to the development;

(5) Portions of the regional trail and open space system;

a. Compact and Contiguous. To the maximum extent practicable, common open space land shall be compact and contiguous unless the land is used as a continuation of an existing greenway, trail, or other linear park, or unless specific topographic features require a different configuration. An example of such topographic features would be the provision of open space along a scenic creek.

b. Accessible to Residents. Common open space shall be reasonably accessible to all of the residents of the development. The city may require access to be restricted if it would degrade, destroy, or adversely interfere with sensitive environmental or natural areas or with significant historic or cultural resources

c. Recreational Facilities. If an applicant constructs recreational facilities in the common open space as a community amenity, such recreational facilities shall be constructed in accordance with applicable city standards regarding, but not limited to, size, siting, use, materials, and similar matters. The recreational facilities shall be built with long-lasting and sturdy materials. A long-term maintenance schedule may be required to ensure that there is sufficient funding and management set in place for the amenity to be maintained and replaced if needed.

d. Design Criteria. Common open spaces, other than those preserved as natural features or areas, should include gardens, courtyards, recreation, or play areas. Required common open space areas over 10,000 square feet of non-natural area shall provide a minimum of five amenities from the list below. Open space of 10,000 feet or less of non-natural area shall provide three amenities.

(i) Seasonal planting/community gardening areas.

(ii) Large trees

(iii) Seating.

(iv) Pedestrian-scaled lighting.

(v) Gazebos or other decorative shelters.

(vi) Play structures for children.

(vii) On-site community recreation amenities.

(viii) Roof gardens or shared patio decks

(ix) An alternative amenity as approved by the Community Development Director.

4. Exceptions to the common open space standard may be granted for the following:
a. For multi-unit developments of up to 25 units (or for the first 25 units of a larger project) no common open space shall be required when such developments are within one-quarter mile (measured walking distance) to a public park of 3 acres or more; and there is a direct, improved, permanent, public, Americans with Disabilities Act (ADA) - accessible, lighted, maintained pedestrian trail or sidewalk between the sites. An exception shall be granted only when the nearby park provides an active and fully improved recreation area.
b. For multi-unit developments with required common open space in excess of 15,000 square feet, the required open space may be reduced by ½ if access to the public is provided. The qualifying open space area shall be for active use, be maintained by the home owners association and not be within the boundaries of a Water Resource Buffer area.

N. Private Open Space
1. Private Open Space Required. All new multi-family developments in all zones except for the Mixed Use Corridor, Neighborhood Commercial or Mixed Use Downtown Districts, shall set aside a private open space for the use and enjoyment of the development's residents. Private open space is a semi-enclosed area, which is intended for use strictly by the occupants of one dwelling unit. Private open space may include porches, balconies, terraces, roof top gardens, verandas, and decks. Dwellings located at finished grade, or within five feet of finished grade, shall provide a minimum of ninety-six square feet of private open space per dwelling unit, with no dimension less than six feet. Dwellings located more than five feet above finished grade shall provide a minimum of forty-eight square feet with no dimension less then six feet. Ground level private open space shall be visually and physically separated from common open space through the use of perimeter landscaping or fencing.

2. Common And Private Open Space Requirements For Multifamily Dwelling Units In The Mixed Use Corridor, Neighborhood Commercial Or Mixed Use Downtown Districts.All residential development in the Mixed Use Corridor, Neighborhood Commercial Or Mixed Use Downtown Districts must provide a portion of the project area for private open space or common open space. Fifty (50) square feet of private or common open space is required for each dwelling unit. The open space may be allocated exclusively for private or common use or may be a combination of the two uses.

a.*Common Open Space*: Common open space may be provided in the form of decks, shared patios, roof gardens, recreation rooms, lobbies or other gathering spaces created strictly for the tenants and not

associated with storage or circulation. Landscape buffer areas may not be used as common open space unless active and passive uses are integrated into the space and its use will not adversely affect abutting properties.

b.Private Open Space: Private open space may be provided in the forms of decks, screened patios, roof gardens or an alternate private space as approved by the Community Development Director.

17.62.059 Cottage Housing

A. Applicability
These guidelines apply to all cottage developments in any applicable zone within the City. Cottages are considered multi-family development and are subject to all the applicable sections of OCMC 17.62. Site Plan and Design Review and OCMC 17.52 Off Street Parking and Loading. However, this section replaces OCMC 17.62.057- multifamily. The proposed development shall be processed under the Type II Land Use process and shall remain one lot. Where there is a conflict between these standards and the standards in other chapters, the Cottage Housing standards shall apply.

B. Intent

1. To provide a housing type that responds to changing household sizes and ages (e.g., retirees, small families, single person households).

2. To encourage creation of more usable open space for residents of the development through flexibility in density and lot standards.

3. To ensure that the overall size, including bulk and mass of cottage structures and cottage housing developments, remain smaller and incur less visual impact than standard sized single-family dwellings, particularly given the allowed intensity of cottage dwellings.

4. To provide centrally located and functional common open space that fosters a sense of community and a sense of openness in cottage housing developments.

5. To provide private area around the individual dwellings to enable diversity in landscape design and foster a sense of ownership.

6. To ensure minimal visual impact from vehicular use and storage areas for residents of the cottage housing development as well as adjacent properties, and to maintain a single-family character along public streets.



Cottage Clusters

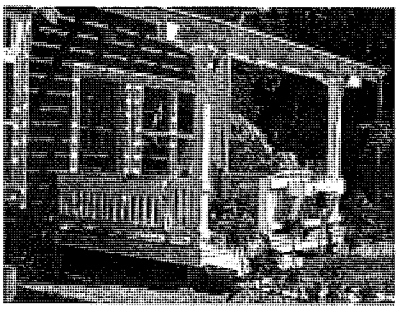
C. Density bonus. For Developments in, R6, R8 and R-10 Zoning Districts: The City shall allow up to two cottage units for each regular dwelling unit allowed under existing standards in applicable zoning districts. For Developments in the R 3.5 and R-5 zoning district: The City shall allow up to 1.5 cottage units for each regular dwelling unit allowed under existing standards in the applicable zoning district. At no time shall the proposed project fall below the minimum required density of the underlying district.

D. Dimensional standards for cottage housing.

Dimensional Standards for Cottage Housing

Standard Requirement

1. Average Gross Floor Area 800 square feet per dwelling
2. Maximum Gross Floor Area 1,200 square feet per dwelling
3. Minimum Gross Floor Area 600 square feet per dwelling
4. Maximum Footprint (not including porches) 700 square feet per dwelling
5. Maximum Accessory building footprint for parking or community use 600 square feet
6. Maximum Accessory building Gross Floor Area for parking or community use 800 square feet
7. Minimum Common Space 400 square feet per dwelling
8. Minimum Private Open Space 200 square feet per dwelling
9. Maximum Height 25 feet.
10. Setbacks (to exterior property lines) Same as the underlying zone
11. Setbacks for non-habitable accessory buildings 200 square feet or less to follow OCMC 17.54.010 (b) 2
12. Minimum Distance Separating dwelling units *(excluding accessory structures)* 10 feet
13. Minimum roof slope of all structures 6:12
14. Minimum Parking Spaces 1.5 space per dwelling
15. Clustered Developments shall contain a minimum of 4 and a maximum of 12 cottage housing units located in a cluster group to encourage a sense of community among the residents. A development site may contain more than one group.
16. Minimum Lot size 10,000 square feet.
17. The total square footage of a cottage dwelling unit may not be increased. A deed restriction shall be placed on the title to the property for purpose of notifying future property owners that any increase in the total square footage of a cottage is prohibited for the life of the cottage or the duration of the city cottage housing regulations.


E. Cottage open space design standards:

1) Common open space requirements for cottage developments:

a) Shall abut at least 50 percent of the cottages in a cottage housing development.
b) Shall have cottages abutting on at least two sides of the common open space.
c) Cottages shall be oriented around and have an entry facing the common open space.
d) Cottages shall be within 60 feet walking distance of the common open space.
e) Shall be at least 20 feet in width.
f) Shall be designed and maintained as an amenity for residents of the development.
g) Up to 25 percent of the required common open space may be utilized through a community building built for the sole use of the cottage housing residents.
h) The applicant shall implement a mechanism, acceptable to the Community Development Director to ensure the continued care and maintenance of the common areas. A typical example would be creation of a management, home owner's association or condominium association with authority and funding necessary to maintain the common areas.

2) Required private open space for cottage dwelling units shall be adjacent to each dwelling unit and for the exclusive use of the cottage resident(s). The private space shall be a minimum of 200 square feet and shall be:

a) Usable (not on a steep slope).
b) Oriented toward the common open space as much as possible.
c) No dimension less than ten feet.

3)Alternative open space configurations may be permitted by the Community Development Director provided they present a hierarchy of usable semi-private and public open spaces that meet the intent of the guidelines.

F. Porches and covered entry standards for cottages:

1) Cottage facades facing the common open space, common pathway, or street shall feature a roofed porch at least sixty square feet in size with a minimum dimension of six feet. The front porch shall be covered and must be a minimum of of 18 inches above average grade and contain railings.

2) *Exemption:* House styles that do not contain porches or require a reduction in the size of the porch or its location may request an exemption from the Community Development Director from (a) above, if another type of pronounced entryway is provided. Pronounced entrances may include a rounded front door, canopy or other articulated entrances, columns, and/or other similar features provided they are compatible with the architectural style of the house. A reduced porch may be allowed if there is sufficient architectural or topographical reason to reduce the size of the porch.

G. Architectural styles. Structures shall be consistent with historic architectural styles

Approved architectural styles includeWestern Farmhouse/Vernacular, Bungalow and Queen Anne Vernacular. Examples and architectural descriptions of Oregon City historic single-family residential styles can be found in the 2006 Historic Review Board's Design Guidelines for New Construction. An alternate architectural style may be approved by the Community Development Director if it meets the intent of this chapter.



Western Farmhouse/Vernacular



Bungalow (Craftsman)



Queen Anne Vernacular

H. Architectural details. Dwelling units shall contain architectural details.

1. Each of the types of details listed below are worth one point unless otherwise noted. Dwelling units must achieve the equivalent of five points worth of architectural details.

a) Stonework detailing on columns or across foundation.

b) Brick or stonework covering more than 10 percent of the facade

c) Wood, cladded wood, or fiberglass windows on all four elevations of the building. *(2- points).*

e) Decorative roofline elements including roof brackets or multiple dormers.

f) Decorative porch elements including scrolls, or brackets, or railings

g) Decorative shingle designs.

h) Decorative paint schemes (three or more colors)i.

Other architectural detailing may be approve by the by the Community Development Director if they are constructed with quality material, have a high level of craftsmanship and are consistent with the architectural style of the dwelling.

2.Approved siding materials.

a. Brick.
b. Basalt stone or basalt veneer
c. Narrow horizontal wood or composite siding (5 inches wide or less); wider siding will be considered where there is a historic precedent.
d. Board and baton siding solely as an accent element unless the design has historic precedent and is approved by the Community Development Director through the exemption process.

3.Other materials may be approve by the Community Development Director if they are consistent with the quality of the approved siding materials and have historic precedence in Oregon City.

I. Windows
All windows on all elevations must be recessed at least two inches from the facade and incorporate window trim at least four inches in width. Windows on corner lots must provide an average of one window every 15 feet of linear elevation on each floor of the side elevation.

J. Cottage parking shall be:

1) Located on the same property as the cottage development.

2) Screened from public streets and adjacent residential uses by landscaping or

architectural screening.

3) Located in clusters of not more than five adjoining spaces (except where parking

areas are adjacent to an alley).

4) Parking spaces are prohibited in the front , interior or and side yard setback areas. Drive aisles and access driveways may be allowed in the side or rear yard setback.

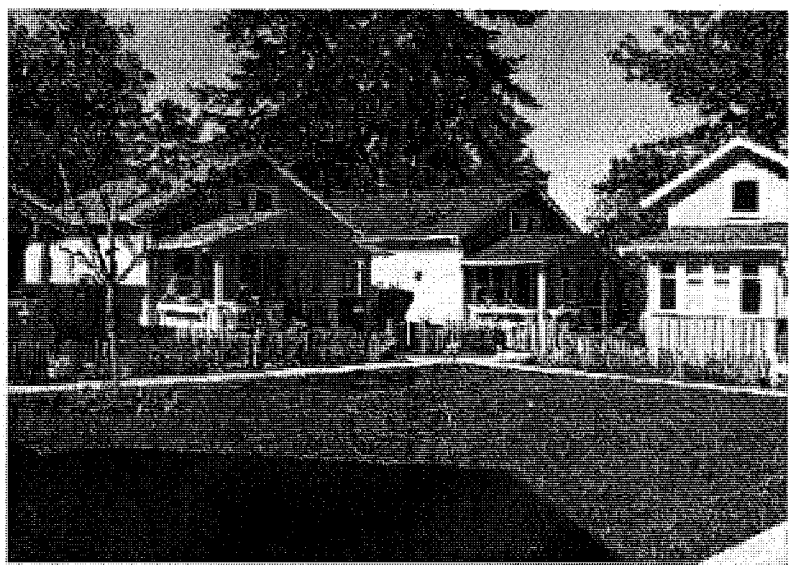
5) A pitched roof design is required for all detached parking structures. Detached parking structures/garages shall be 600 square feet or less and are not counted as part of the gross floor area of the cottage.

6) Garages may be attached to individual cottages provided all other design standards have been met and the footprint of the ground floor, including the garage, is included as part of the gross floor area calculations. Such garages shall be located away from common open spaces, shall not gain access off a public street and shall have garage doors of 10 feet or less in width and be architecturally subordinate to the cottage. No Accessory Dwelling Units (ADU) are allowed within a cottage housing development.

K. Fences.
All fences on the interior of the development shall be no more than thirty-six inches in height. Fences along the exterior property lines are subject to the fence requirements of OCMC 17.54.100. Chain link fences shall not be allowed.

L. Existing Dwelling Unit Onsite

An existing single-family home incorporated into a Cottage Housing Development that does not meet the requirements of this chapter is permitted to remain on a site developed for cottage housing and shall be considered a dwelling in the development. The size of the existing single family dwelling unit may be over the 1200 square foot maximum. The existing dwelling unit shall not be part of the average Gross Floor Area calculations. Modifications or additions to the existing dwelling unit not consistent with the provisions of this chapter shall not be permitted.





17.62.065 Outdoor Lighting

A. Purpose. The general purpose of this Section is to require outdoor lighting that is adequate for safety and convenience; in scale with the activity to be illuminated and its surroundings; directed to the surface or activity to be illuminated; and designed to clearly render people and objects and contribute to a pleasant nighttime environment. Additional specific purposes are to:

1. Provide safety and personal security as well as convenience and utility in areas of public use or traverse, for uses where there is outdoor public activity during hours of darkness;
2. Control glare and excessive brightness to improve visual performance, allow better visibility with relatively less light, and protect residents from nuisance and discomfort;
3. Control trespass light onto neighboring properties to protect inhabitants from the consequences of stray light shining in inhabitants' eyes or onto neighboring properties;
4. Result in cost and energy savings to establishments by carefully directing light at the surface area or activity to be illuminated, using only the amount of light necessary; and
5. Control light pollution to minimize the negative effects of misdirected light and recapture views to the night sky.

B. Applicability

1. General

a. All exterior lighting for any type of commercial, mixed-use, industrial or multi-family development shall comply with the standards of this Section, unless excepted in Subsection B.3.
b. The City Engineer/Public Works Director shall have the authority to enforce these regulations on private property if any outdoor illumination is determined to present an immediate threat to the public health, safety and welfare.

2. Lighting Plan Requirement

All commercial, industrial, mixed-use, cottage housing and multi-family developments shall submit a proposed exterior lighting plan. The plan must be submitted concurrently with the site plan. The exterior lighting plan shall include plans and specifications for streetlights, parking lot lights, and exterior building lights. The specifications shall include details of the pole, fixture height and design, lamp type, wattage, and spacing of lights.

3. Excepted Lighting

The following types of lighting are excepted from the requirements of this

Section.

a. Residential lighting for single-family attached and detached homes, and duplexes.
b. Public street and right-of-way lighting.
c. Temporary decorative seasonal lighting provided that individual lamps have a light output of 60 watts or less.
d. Temporary lighting for emergency or nighttime work and construction.
e. Temporary lighting for theatrical, television, and performance areas, or for special public events.
f. Lighting for a special district, street, or building that, according to an adopted municipal plan or ordinance, is determined to require special lighting aesthetics as part of its physical character.
g. Lighting required and regulated by the Federal Aviation Administration.

C. General Review Standard. If installed, all exterior lighting shall meet the functional security needs of the proposed land use without adversely affecting adjacent properties or the community. For purposes of this Section, properties that comply with the design standards of Subsection D below shall be deemed to not adversely affect adjacent properties or the community.

D. Design and Illumination Standards

General Outdoor Lighting Standard and Glare Prohibition

1. Outdoor lighting, if provided, shall be provided in a manner that enhances security, is appropriate for the use, avoids adverse impacts on surrounding properties, and the night sky through appropriate shielding as defined in this section. Glare shall not cause illumination on other properties in excess of a measurement of 0.5 foot-candles of light as measured at the property line. In no case shall exterior lighting add more than 0.5 footcandle to illumination levels at any point off-site.Exterior lighting is not required except for purposes of public safety. However, if installed, all exterior lighting shall meet the following design standards:
2. Any light source or lamp that emits more than 900 lumens (13 watt compact fluorescent or 60 watt incandescent) shall be concealed or shielded with a full cut-off style fixture in order to minimize the potential for glare and unnecessary diffusion on adjacent property. All fixtures shall utilize one of the following bulb types: metal halide, induction lamp, compact fluorescent, incandescent (including tungsten-halogen), or high pressure sodium with a color rendering index above 70.
3. The maximum height of any lighting pole serving a multi-family residential use shall be 20 feet. The maximum height serving any other type of use shall be 25 feet, except in parking lots larger than five acres, the maximum height shall be 35 feet if the pole is located at least 100 feet from any residential use.
4. Lighting levels

Table 1-17.62.065. Foot-candle Levels

Location	Min	Max	Avg
Pedestrian Walkways	0.5	7:1 max/min ratio	1.5
Pedestrian Walkways in Parking Lots		10:1 max/min ratio	0.5
Pedestrian Accessways	0.5	7:1 max/min ratio	1.5
Building Entrances	3		
Bicycle Parking Areas	3		
Abutting property	N/A	.05	

5. Parking lots and other background spaces shall be illuminated as unobtrusively as possible while meeting the functional needs of safe circulation and protection of people and property. Foreground spaces, such as building entrances and outside seating areas, shall utilize pedestrian scale lighting that defines the space without glare.
6. Any on-site pedestrian circulation system shall be lighted to enhance pedestrian safety and allow employees, residents, customers or the public to use the walkways at night. Pedestrian walkway lighting through parking lots shall be lighted to light the walkway and enhance pedestrian safety pursuant to Table 1.
7. Pedestrian Accessways. To enhance pedestrian and bicycle safety, pedestrian accessways required pursuant to OCMC 12.28 shall be lighted with pedestrian-scale lighting. Accessway lighting shall be to a minimum level of one-half foot-candles, a one and one-half foot-candle average, and a maximum to minimum ratio of seven-to-one and shall be oriented not to shine upon adjacent properties. Street lighting shall be provided at both entrances. Lamps shall include a high-pressure sodium bulb with an unbreakable lens.
8. Floodlights shall not be utilized to light all or any portion of a building facade between 10:00 pm and 6:00 am.
9. Lighting on automobile service station, convenience store, and other outdoor canopies shall be fully recessed into the canopy and shall not protrude downward beyond the ceiling of the canopy.
10. The style of light standards and fixtures shall be consistent with the style and character of architecture proposed on the site.
11. In no case shall exterior lighting add more than 1 foot-candle to illumination levels at any point off-site.
12. All outdoor light not necessary for security purposes shall be reduced, activated by motion sensor detectors, or turned off during non-operating hours.
13. Light fixtures used to illuminate flags, statues, or any other objects mounted on a pole, pedestal, or platform shall use a narrow cone beam of light that will not extend beyond the illuminated object.
14. For upward-directed architectural, landscape, and decorative lighting, direct light emissions shall not be visible above the building roofline.
15. No flickering or flashing lights shall be permitted, except for temporary decorative seasonal lighting.
16. Wireless Sites. Unless required by the Federal Aviation Administration or the Oregon Aeronautics Division, artificial lighting of wireless communication towers and antennas shall be prohibited. Strobe lighting of Wireless Communication facilities is prohibited unless required by the Federal Aviation Administration. Security lighting for equipment shelters or cabinets and other on-the-ground auxiliary equipment on Wireless Communication Facilities shall be initiated by motion detecting lighting.
17. Lighting for outdoor recreational uses such as ball fields, playing fields, tennis courts, and similar uses, provided that such uses comply with the following standards:
    i. Maximum permitted light post height: 80 feet.

    ii. Maximum permitted illumination at the property line: 0.5 foot-candles.

17.62.080 Special Development Standards along Transit Streets.

A. Purpose. This section is intended to provide direct and convenient pedestrian access to retail, office and institutional buildings from public sidewalks and transit facilities and to promote pedestrian and transit travel to commercial and institutional facilities.

B. Applicability. Except as otherwise provide in this section, the requirements of this section shall apply to the construction of new retail, office and institutional buildings which front on a transit street.

C. Development Standards.

1. All buildings shall have at least one main building entrance oriented towards the transit street. A main building entrance is oriented toward a transit street if it is directly located on the transit street, or if it is linked to the transit street by an on-site pedestrian walkway that does not cross off-street parking or maneuvering areas.

   a. If the site has frontage on more than one transit street, or on a transit street and a street intersecting a transit street, the building shall provide one main building entrance oriented to the transit street or to the corner where the two streets intersect.

   b. For building facades over three hundred feet in length on a transit street, two or more main building entrances shall be provided as appropriate and oriented towards the transit street

2. Main building entrances shall be well lighted and visible from the transit street. The minimum lighting level for building entries shall be three foot-candles. Lighting shall be a pedestrian scale with the source light shielded to reduce glare.

3. In the event a requirement of this section conflicts with other requirements in Title 17, the requirements of this section shall control.

D. Exemptions. The following permitted uses are exempted from meeting the requirements of subsection C of this section:

1. Heavy equipment sales;

2. Motor vehicle service stations, including convenience stores associated therewith;

3. Solid waste transfer stations; and

4.Truck stops, including convenience stores, eating or drinking establishments, overnight accommodations or other similar services associated therewith. A use found by the Community Development Director to be similar to the exempt uses above.

17.62.085: Refuse and Recycling Standards For Commercial, Industrial, and Multi-family Developments

The purpose and intent of these provisions is to provide an efficient, safe and convenient refuse and recycling enclosure for the public as well as the local collection firm. All new development, change in property use, expansions or exterior alterations to uses other than single-family or duplex residences shall include a refuse and recycling enclosure. The area(s) shall be:

A. Sized appropriately to meet the needs of current and expected tenants, including an expansion area if necessary;
B. Designed with sturdy materials, which are compatible to the primary structure(s);
C. Fully enclosed and visually screened;
D. Located in a manner easily and safely accessible by collection vehicles;
E. Located in a manner so as not to hinder travel lanes, walkways, streets or adjacent properties;
F. On a level, hard surface designed to discharge surface water runoff and avoid ponding;
G. Maintained by the property owner;
H. Used only for purposes of storing solid waste and recyclable materials;
I. Designed in accordance with applicable sections of the Oregon City Municipal Code (including Chapter 8.20-Solid Waste Collection and Disposal) and City adopted policies.

17.62.090 Enforcement.

A. Applications for site plan and design review shall be reviewed in the manner provided in Chapter 17.50. The city building official may issue a certificate of occupancy only after the improvements required by site plan and design review approval have been completed, or a schedule for completion and a bond or other financial guarantee have been accepted by the city.

B. In performing site plan and design review, the review authority shall consider the effect of additional financial burdens imposed by such review on the cost and availability of needed housing types. Consideration of such factors shall not prevent the imposition of conditions of approval found necessary to meet the requirements of this section. The cost of such conditions of approval shall not unduly increase the cost of housing beyond the minimum necessary to achieve the provisions of this title, nor shall such cost prevent the construction of needed housing types. The use of the site plan and design review provisions of this section shall have no effect on dwelling unit densities.

17.62.095 Performance Guarantees.

A. Purpose. This section states the requirements for performance guarantees when they are required of an applicant by this Section or as a condition of a site plan and design review approval.
B. Types of guarantees. Guarantees by the applicant may be in the form of a performance bond payable to the City in cash, by certified check, time certificate of deposit, irrevocable letter of credit, or other form acceptable to the City. Indemnity agreements may be used by other governmental agencies. Guarantees must be accompanied by a contract. The form of the guarantee and contract must be approved by the City Attorney. The Community Development Director is authorized to accept and sign the contract for the City, and to accept the guarantee. The guarantee must be filed with the City Recorder.

C. Amount of guarantee. The amount of the performance guarantee must be equal to at least 110 percent of the estimated cost of performance. The applicant must provide written estimates by three contractors with their names and addresses. The estimates must include as separate items all materials, labor, and other costs of the required action.
D. Completion. An inspection and approval of the action or improvement covered by the performance guarantee is required before the performance guarantee is returned. The inspection is done by the Planning Division or by other appropriate City departments. If the action or improvement is not completed satisfactorily within the stated time limits, the City may have the necessary action or improvement completed and seek reimbursement for the work from the performance guarantee. Any remaining funds will be returned to the applicant.

17.62.100 Fees.

Pursuant to Section 17.50.480, a nonrefundable application fee shall accompany the application for site plan and review.

Oregon City Municipal Code Chapter 17.65 - Master Plans

17.65.10 Purpose and Intent

It is the intent of this Chapter to foster the growth of major institutions and other large-scale development, while identifying and mitigating the impacts of such growth on surrounding properties and public infrastructure. The City recognizes the valuable services and employment opportunities that these developments bring to Oregon City residents. The master plan process is intended to facilitate an efficient and flexible review process for major developments and to provide them with the assurance they need over the long term so that they can plan for and execute their developments in a phased manner. To facilitate this, the master plan process is structured to allow an applicant to address the larger development issues, such as adequacy of infrastructure and transportation capacity, and reserve capacity of the infrastructure and transportation system before expenditure of final design costs.

17.65.20 What is Included in a Master Plan

A. A Master Plan is a two-step process that includes a General Development Plan and a Detailed Development Plan.

A General Development Plan incorporates the entire area where development is planned in the next 5-20 years, including the identification of one or more development phases. The General Development Plan may encompass land that is not currently under the applicant's control, but which eventually may be controlled by the applicant during the duration of the master plan. The plan shall have no effect for lands not currently controlled by the applicant. "Controlled" shall be defined as leased or owned by the applicant.

A Detailed Development Plan is the phase or phases of the General Development Plan that are proposed for development within two-years.

B. A Master Plan identifies the current and proposed use of the development, as defined by the General Development Plan boundary. If approved, the General Development Plan may be used to allow existing legal non-conforming uses. If conditions of approval from a previous land use decision have not been completed, they must be modified through the General Development Plan or completed with new development.

C. A Master Plan identifies future development impacts, thresholds for mitigation and mitigation improvements and implementation schedules.

A threshold for mitigation is the point that determines when or where a mitigation improvement will be required. Examples of "thresholds" include vehicle trips, square feet of impervious surface area, water usage measured in gallons per minute, construction of a building within a General Development Plan and construction of a building within a certain distance of a residential lot.

Mitigation improvements are improvements that will be made or constructed by an institution when a threshold for mitigation is reached. Examples include road dedication, intersection improvement, road widening, construction of a stormwater or water quality facility, installation of vegetative buffering and wetland restoration or enhancement.

17.65.030 Applicability of the Master Plan Regulations.

A. Submission. A master plan shall be submitted for any institutional development on a site over ten acres in size. If the boundaries of an institutional development exceed ten acres in size, the proposed development shall be master planned using the regulations of this chapter. No permit under this title shall by issued for any institutional development in excess of ten acres in total acreage unless it is accompanied by or preceded by a master plan approval under this chapter.
The provisions of this chapter do not apply to modifications to existing institutional developments unless the modification results in a cumulative square footage increase of over ten thousand total building square feet in an existing institutional development over ten acres.

B. When Required as Part of Previous Land Use Review. The master plan regulations may be used to fulfill a condition of approval from a previous land use decision-requiring master planning for a development.

C. When Identified in the Oregon City Comprehensive Plan. The master plan regulations are required for all properties identified for master planning in the Land Use section of the Oregon City Comprehensive Plan.

D. Voluntarily. An applicant may voluntarily submit a master plan as part of a land use review. (Ord. 03-1014, Att. B3 (part), 2003)

17.65.040 Procedure.

A. Preapplication Review. Prior to filing for either General Development Plan or detailed development plan approval, the applicant shall file a pre-application conference pursuant to Section 17.50.030.

B. General Development Plan. An application for a General Development Plan describing the the long-term buildout of the site shall be reviewed through a Type III procedure. An applicant must have an approved General Development Plan before any detailed development plan may be approved, unless both are approved or amended concurrently. Amendments to an approved General Development Plan shall be reviewed under a Type III procedure pursuant to Section 17.65.080.

C. Detailed Development Plan. An application for a detailed development plan, is processed through a Type II procedure, as long as it is in conformance with the approved General Development Plan. Amendments to an approved detailed development plan shall be processed pursuant to Section 17.65.080. Once a development has an approved detailed development plan, Chapter 17.62 Site Plan and Design Review is not be required.

D. Concurrent Review. An applicant may concurrently apply for a General Development Plan and a detailed development plan, or any phase of a detailed development plan. Such a concurrent application is reviewed through a Type III procedure. (Ord. 03-1014, Att. B3 (part), 2003)

17.65.50 General Development Plan

A. Existing Conditions Submittal Requirements

1. Narrative statement. An applicant must submit a narrative statement that describes the following:

a. Current uses of and development on the site, including programs or services.

b. History or background information about the mission and operational characteristics of the institution that may be helpful in the evaluation of the General Development Plan.

c. A vicinity map showing the location of the General Development Plan boundary relative to the larger community, along with affected major transportation routes, transit, and parking facilities. At least one copy of the vicinity map must be 8.5" x 11" in size, and black and white reproducible.

d. Non-institutional uses that surround the development site. May also reference submitted maps, diagrams or photographs.

e. Previous land use approvals within the General Development Plan boundary and related conditions of approval.

f. Existing utilization of the site. May also reference submitted maps, diagrams or photographs.

g. Site description, including the following items. May also reference submitted maps, diagrams or photographs.

(1) Physical characteristics,
(2) Ownership patterns,
(3) Building inventory,
(4) Vehicle/bicycle parking,
(5) Landscaping/usable open space,
(6) FAR/lot coverage,
(7) Natural resources that appear on the City's adopted Goal 5 inventory,
(8) Cultural/historic resources that appear on the City's adopted Goal 5 inventory, and,
(9) Location of existing trees 6" in diameter or greater when measured 4' above the ground. The location of single trees shall be shown. Trees within groves may be clustered together rather than shown individually.

h. Existing transportation analysis, including the following items. May also reference submitted maps, diagrams or photographs.

(1) Existing transportation facilities, including highways, local streets and street classifications, and pedestrian and bicycle access points and ways;
(2) Transit routes, facilities and availability;
(3) Alternative modes utilization, including shuttle buses and carpool programs; and
(4) Baseline parking demand and supply study (may be appended to application or waived if not applicable).

i. Infrastructure facilities and capacity, including the following items.

(1) Water,
(2) Sanitary sewer,
(3) Stormwater management, and
(4) Easements.

2. Maps and Plans.

a. Existing conditions site plan. Drawn at a minimum scale of one-inch equals one hundred feet (1"=100') that shows the following items. At least one copy must be 8.5" x 11" in size, and black and white reproducible.

(1) Date, north point, and scale of drawing.
(2) Identification of the drawing as an existing conditions site plan.
(3) Proposed development boundary.
(4) All parking, circulation, loading and service areas, including locations of all carpool, vanpool and bicycle parking spaces as required in Chapter 52 of this title.
(5) Contour lines at two-foot contour intervals for grades zero to ten percent, and five-foot intervals for grades over ten percent.

(6) A site plan or plans, to scale, for the General Development Plan site and surrounding properties containing the required information identified in:

a. Chapter 17.62.040.A(1), (2), (3), (4), (5), (6), (7), (9), (11), (12), (13), (14), and (15);
b. Chapter 17.62.040.B;
c. Chapter 17.62.040.F; and
d. Chapter 17.62.040.G

b. Vicinity map. Depicting the location of the site sufficient to define its location, including identification of nearest cross streets. At least one copy of the vicinity map must be 8.5" x 11" in size, and black and white reproducible.

c. Aerial photo. Depicting the subject site and property within 250 feet of the proposed development boundaries. At least one copy of the aerial photo must be 8.5" x 11" in size, and black and white reproducible.

B. Proposed Development Submittal Requirements

1. Narrative statement. An applicant shall submit a narrative statement that describes the following:

a. The proposed duration of the General Development Plan.
b. The proposed development boundary. May also reference submitted maps or diagrams.
c. A description, approximate location, and timing of each proposed phase of development, and a statement specifying the phase or phases for which approval is sought under the current application. May also reference submitted maps or diagrams.
d. An explanation of how the proposed development is consistent with the purposes of Section 17.65, the institutional zone, and any applicable overlay district.
e. A statement describing the impacts of the proposed development on inventoried Goal 5 natural, historic or cultural resources within the development boundary or within 250 feet of the proposed development boundary.
f. An analysis of the impacts of the proposed development on the surrounding community and neighborhood, including:
   (1) Transportation impacts as prescribed in Subsection "g" below;
   (2) Internal parking and circulation impacts and connectivity to sites adjacent to the development boundary and pubic right-of-ways within 250 feet of the development boundary;
   (3) Public facilities impacts (sanitary seer, water and stormwater management) both within the development boundary and on city-wide systems;
   (4) Neighborhood livability impacts;
   (5) Natural, cultural and historical resource impacts within the development boundary and within 250 feet of the development boundary.
g. A summary statement describing the anticipated transportation impacts of the proposed development. This summary shall include a general description of the impact of the entire development on the local street and road network, and shall specify the maximum projected average daily trips, projected AM and PM peak hour traffic and the maximum parking demand associated with build-out each phase of the master plan.

h. In addition to the summary statement of anticipated transportation impacts, an applicant shall provide a traffic impact study as specified by City requirements. The transportation impact study shall either:
   (1) address the impacts of the development of the site consistent with all phases of

the General Development Plan; or

(2) address the impacts of specific phases if the City Engineer determines that the traffic impacts of the full development can be adequately evaluated without specifically addressing subsequent phases.

i. If an applicant chooses to pursue option h(1), the applicant may choose among three options for implementing required transportation capacity and safety improvements:

(1) The General Development Plan may include a phasing plan for the proposed interior circulation system and for all on-site and off-site transportation capacity and safety improvements required on the existing street system as a result of fully implementing the plan. If this option is selected, the transportation phasing plan shall be binding on the applicant.

(2) The applicant may choose to immediately implement all required transportation safety and capacity improvements associated with the fully executed General Development Plan. If this option is selected, no further transportation improvements will be required from the applicant. However, if a General Development Plan is later amended in a manner so as to cause the projected average daily trips, the projected AM or PM peak hour trips, or the peak parking demand of the development to increase over original projections, an additional transportation impact report shall be required to be submitted during the detailed development plan review process for all future phases of the development project and additional improvements may be required.

(3) The applicant may defer implementation of any and all capacity and safety improvements required for any phase until that phase of the development reaches the detailed development plan stage. If this option is selected, the applicant shall submit a table linking required transportation improvements to vehicle trip thresholds for each development phase.

j. The applicant or city staff may propose objective development standards to address identified impacts that will apply within the proposed development on land that is controlled by the institution. Upon approval of the General Development Plan, these standards will supercede corresponding development standards found in this code. Development standards shall address at least the following:

(1) Pedestrian, bicycle and vehicle circulation and connectivity;

(2) Internal vehicle and bicycle parking;

(3) Building setbacks, landscaping and buffering;

(4) Building design, including pedestrian orientation, height, bulk, materials, ground floor windows and other standards of Chapter 17.62; and

(5) Other standards that address identified development impacts.

2. Maps and diagrams. The applicant must submit, in the form of scaled maps or diagrams, as appropriate, the following information:

a. A preliminary site circulation plan showing the approximate location of proposed vehicular, bicycle, and pedestrian access points and circulation patterns, parking and loading areas or, in the alternative, proposed criteria for the location of such facilities to be determined during detailed development plan review.

b. The approximate location of all proposed streets, alleys, other public ways, sidewalks, bicycle and pedestrian access ways and other bicycle and pedestrian ways, transit streets and facilities, neighborhood activity centers and easements on and within 250 feet of the site. The map shall identify existing subdivisions and development and un-subdivided or unpartitioned land ownerships adjacent to the proposed development site and show how existing streets, alleys, sidewalks, bike routes, pedestrian/bicycle access ways and utilities within 250 feet may be extended to and/or through the

proposed development.
c. The approximate location of all public facilities to serve the proposed development, including water, sanitary sewer, stormwater management facilities.
d. The approximate projected location, footprint and building square footage of each phase of proposed development.
e. The approximate locations of proposed parks, playgrounds or other outdoor play areas; outdoor common areas and usable open spaces; and natural, historic and cultural resource areas or features proposed for preservation. This information shall include identification of areas proposed to be dedicated or otherwise preserved for public use and those open areas to be maintained and controlled by the owners of the property and their successors in interest for private use.

C. Approval Criteria for a General Development Plan. The Planning Commission shall approve an application for General Development Plan approval only upon finding that the following approval criteria are met.

1. The proposed General Development Plan is consistent with the purposes of Section 17.65.

2. The transportation system has sufficient capacity based on the City's level of service standards and is capable of supporting the development proposed in addition to the existing and planned uses in the area, or will be made adequate by the time each phase of the development is completed.

3. Public services for water supply, police, fire, sanitary waste disposal, and storm-water disposal are capable of serving the proposed development, or will be made capable by the time each phase of the development is completed.

4. The proposed General Development Plan protects any inventoried Goal 5 natural, historic or cultural resources within the proposed development boundary consistent with the provisions of applicable overlay districts.

5. The proposed General Development Plan, including development standards and impact mitigation thresholds and improvements adequately mitigates identified impacts from each phase of development. For needed housing, as defined in ORS 197.303(1), the development standards and mitigation thresholds shall contain clear and objective standards.

6. The proposed General Development Plan is consistent with the Oregon City Comprehensive Plan and its ancillary documents.

D. Duration of General Development Plan. A General Development Plan shall involve a planning period of at least five years and up to twenty years. An approved General Development Plan shall remain in effect until development allowed by the plan has been completed through the detailed development plan process, the plan is amended or superceded, or the plan expires under its stated expiration date. (Ord. 03-1014, Att. B3 (part), 2003)

17.65.60 Detailed Development Plan

A. Submittal Requirements.
1. A transportation impact study documenting the on- and off-site transportation impacts, as specified in 17.65.050.B.1.h(1). If such an analysis was submitted as part of the General Development Plan process, the scope of the report may be limited to any changes which have occurred during the interim and any information listed below which was not a part of the initial study.

The on-site portion of the analysis shall include the location, dimensions and names of all

proposed streets, alleys, other public ways, sidewalks, bike routes and bikeways, pedestrian/bicycle access ways and other pedestrian and bicycle ways, transit streets and facilities, neighborhood activity centers, and easements on and within 250 feet of the boundaries of the site. The map shall identify existing subdivisions and development and un-subdivided or unpartitioned land ownerships adjacent to the proposed development site and show how existing streets, alleys, sidewalks, bike routes, pedestrian/bicycle access ways and utilities within 250 feet may be extended to and/or through the proposed development.

2. The location within the development and in the adjoining streets of existing and proposed sewers, water mains, culverts, drain pipes, underground electric, cable television and telephone distribution lines, gas lines, and the location of existing aerial electric, telephone and television cable lines, if any, to be relocated within the development.

3. A site plan or plans, to scale, containing the required information identified in:
   a. Chapter 17.62.040.A.(8), (10), (11), (12), (13), (14), and (15);
   b. Chapter 17.62.040.B;
   c. Chapter 17.62.040.C;
   d. Chapter 17.62.040.D;
   e. Chapter 17.62.040.E;
   f. Chapter 17.62.040.G;
   g. Chapter 17.62.040.H; and
   h. Chapter 17.62.040.J

4. Any other information the Community Development Director deems necessary to show that the proposed development will comply with all of the applicable Chapter 17 requirements.

B. Approval Criteria. The Community Development Director shall approve an application for detailed development plan approval only upon findings that:

1. All development standards and impact mitigation meet the requirements of the approved General Development Plan, including conditions of approval.

2. Any other applicable zoning regulations that are not addressed in the General Development Plan are met, unless an adjustment to those regulations has been applied for and is approved. The approval standards applicable to adjustments required as part of a master plan are contained in 17.65.070.

3. The detailed development plan conforms with the standards contained in Chapter 17.62, unless adjusted as provided in 17.65.070.

C. Duration of Detailed Development Plan. Unless substantial expenditures have been made to implement the approved detailed development plan, defined as the submittal to the city of engineered plans for approval, a detailed development plan shall expire twenty-four months from the notice of decision date. The date of final approval includes the resolution of all appeals. Upon the receipt from the applicant of a written request and payment of the required fee prior to the expiration dated of the Detailed Development Plan, the Community Development Director may, on a one-time basis, grant a 12-month extension.

17.65.070 Adjustments to Development Standards.

A. Purpose. In order to implement the purpose of the City's master plan process, which is to foster the growth of major institutions and other large-scale development, while identifying and mitigating their impacts on surrounding properties and public infrastructure, an applicant may request one or more adjustments to the applicable development regulations as

part of the master planning process. These include, but are not limited to, items such as: dimensional standards of the of the underlying zone, Site Plan and Design Review criteria, residential design standards, and standards for land division approval.

B. Procedure. Requests for adjustments shall be processed concurrently with a General Development Plan. An adjustment request at the detailed development plan review shall cause the detailed development plan to be reviewed as a Type III application.

C. Regulations That May Not be Adjusted. Adjustments are prohibited for the following items:
1. To allow a primary or accessory use that is not allowed by the regulations;
2. To any regulation that contains the word "prohibited";
3. As an exception to a threshold review, such as a Type III review process; and
4. Any exception to allow a use not identified as a permitted or conditional use in the underlying zone.

D. Approval Criteria. A request for an adjustment to one or more applicable development regulations under this section shall be approved if the review body finds that the applicant has shown the following criteria to be met.
1. Granting the adjustment will equally or better meet the purpose of the regulation to be modified;
2. If more than one adjustment is being requested, the cumulative effect of the adjustments results in a project that is still consistent with the overall purpose of the zone;
3. City-designated Goal 5 resources are protected to the extent otherwise required by Title 17;
4. Any impacts resulting from the adjustment are mitigated; and
5. If in an environmental zone, the proposal has as few significant detrimental environmental impacts on the resource and resource values as is practicable. (Ord. 03-1014, Att. B3 (part), 2003)
6. The proposed adjustment is consistent with the Oregon City Comprehensive Plan and ancillary documents.

17.65.80 Amendments to Approved Plans

A. When Required. An amendment to an approved General Development Plan or detailed development plan is required for any use or development that is not in conformance with the applicable plan, as provided below. The approval criteria contained in 17.65.050 will apply to General Development Plan amendments, the approval criteria contained in 17.65.060 will apply to detailed development plan amendments. The thresholds and procedures for amendments are stated below.
B. Type III Procedure. Unless the approved General Development Plan or detailed development plan specifically provides differently, amendments to either plan that require a Type III procedure are:
   1. Any proposed development on the site that is within 100 feet of the master plan boundaries, unless a greater distance is stated in the master plan;
   2. A proposed expansion of the approved boundary;
   3. A proposed reduction in the approved boundary that affects a condition of approval, or takes the site out of conformance, or further out of conformance, with a development standard;
   4. Proposals that increase the amount, frequency, or scale of a use over 10 percent of what

was approved (examples include the number of students, patients or members; the number of helicopter flights; the number or size of special events);

5. New uses not covered in the plan that will increase vehicle transportation to the site, except for those that are replacing another use so that there is no net increase in vehicles drawn to the site;
6. Increases in overall floor area of development on the site of over 10 percent;
7. A increases/decrease greater than 10 percent in the amount of approved or required parking; and
8. Proposed uses or development which were reviewed, but were denied because they were found not to be in conformance with an approved plan.

C. Type II Procedure. Unless an approved plan specifically provides otherwise, amendments to a General Development Plan or detailed development plan not specifically stated in Subsection B or D are processed through a Type II procedure.

D. Type I Procedure. Unless an approved plan specifically provides otherwise, the following amendments to a General Development Plan or detailed development plan shall be processed through a Type I procedure:
   1. Accessory uses and structures that meet applicable development regulations;
   2. Reconfiguration of approved parking or landscape designs that do not alter the points of ingress or egress, and do not change the number of parking spaces required, so long as the reconfiguration meets applicable development regulations; and
   3. Structures for approved uses that do not exceed 1500 square feet in size and that meet applicable development regulations.

17.65.090 Regulations that Apply

An applicant is entitled to rely on land use regulations in effect on the date its General Development Plan application was initially submitted, pursuant to ORS 227.178(3), as that statute may be amended from time to time. After a General Development Plan is approved, and so long as that General Development Plan is in effect, an applicant is entitled to rely on the land use regulations in effect on the date its General Development Plan application was initially submitted, as provided above, when seeking approval of detailed development plans that implement an approved General Development Plan. At its option, an applicant may request that a detailed development plan be subject to the land use regulations in effect on the date its detailed development plan is initially submitted.

Oregon City Municipal Code
Chapter 17.80 Communication Facilities

17.80.10 Purpose.

The provisions of this chapter are designed to protect the visual, aesthetic, and historical features of Oregon City, ensure that wireless communications services are located, designed, installed, maintained, and removed in an appropriate manner for the safety, health, and welfare of the citizens of Oregon City, and to provide for development consistent with the Oregon City Comprehensive Plan by:

A. Promoting maximum utilization and encourage collocation of new and existing wireless communication antennas to minimize the total number of support structures and towers throughout the City;
B. Encouraging careful consideration of topography, greenways, and historical significance of potential telecommunication sites and the use of camouflaging and screening to ensure development has minimal impacts on the community, views, and historical areas;
C. Encouraging the use of existing buildings, light or utility poles, or water towers as opposed to construction of new telecommunication towers; and
D. Encourage the location of monopole telecommunication towers and antenna arrays in non-residential areas.

17.80.30 Applicability and Exemptions.

A. Applicability. All wireless communication facilities that are not exempt pursuant to this section shall conform to the standards specified in this chapter.
B. Exemptions. The following are exempt from the provisions of this chapter and shall be allowed:
   1. Wireless communication facilities that were legally established prior to the effective date of this chapter;
   2. Temporary facilities used on the same property for sixty (60) days or less;
   3. Temporary wireless communications facilities of all types that are used by a public agency solely for emergency communications in the event of a disaster, emergency preparedness, or public health or safety purposes;
   4. Any maintenance or repair of previously approved wireless communications facilities provided that such activity does not increase the height, width, or mass of the facility;
   5. Dish antennas used for residential purposes;
   6. VHF and UHF receive-only television antennas and radio transmitter antennas on public facilities used for public safety, provided they are fifteen (15) feet or less above the existing or proposed roof;
   7. Amateur Stations on properties zoned residential are exempt from the standards of this Chapter. Amateur Stations on properties zoned non-residential are exempt from the standards of this Chapter, provided the antenna is fifteen (15) feet or less above the existing or proposed roof. Amateur Stations located on: (1) public facilities/property; or (2) properties zoned non-residential with an antenna in excess of fifteen (15) feet above the existing or proposed roof, shall be reviewed under the Compatibility Review process set forth in this Chapter and shall be subject to the Design Standards of Section 17.80.110; and
   8. Wireless Communication Facilities for public safety are exempt from the following Sections: Section 17.80.090.C.17, Section 17.80.090.D.2, Section 17.80.090.D.5, and Section 17.80.100.

17.80.40 Collocation of Additional Antenna(s) on Existing Support Towers.

The following standards shall apply for the placement of antenna(s) and auxiliary support equipment on an existing wireless communication facility support tower.

A. Compatibility Review. Required for property zoned GI, CI, I, C, HC, MUC-1, MUC-2, MUE, MUD or NC.
B. Site Plan and Design Review. Required for all cases other than those identified in Section 17.80.040.A.

17.80.50 Collocation of Additional Antenna(s) on Support Structures.

The following standards shall apply for the placement of antenna(s) and auxiliary support equipment on a support structure.

A. Compatibility Review. Required if the following exist:
   1. Property is zoned GI, CI, I, C, HC, MUC-1, MUC-2, MUE, MUD or NC; and
   2. Property is not located in the McLoughlin or Canemah Historical Conservation Districts; and
   3. Antenna(s) and auxiliary support equipment are setback a minimum of 10 feet from each edge of the support structure and do not exceed a total height of 12 feet or a total width of 8 feet, unless the antenna(s) is less than 4 inches in diameter and does not exceed a total height of 20 feet.
B. Site Plan and Design Review. Required if the property is zoned GI, CI, I, C, MUC-1, MUC-2, MUE, MUD or NC and does not meet all the criteria of Section 17.80.050.A.
C. Conditional Use Review. Required for all cases other than those identified in Sections 17.08.050.A and B.

17.80.60 Collocation of Additional Antenna(s) on Existing Utility Poles, Light Standards, and Light Poles.

The following standards shall apply for the collocation of additional antenna(s) on existing utility poles, light standards, and light poles that meet the following requirements:
A. Site Plan and Design Review. Required for property zoned GI, CI, I, C, HC, MUC-1, MUC-2, MUE, MUD or NC.
B. Conditional Use Review. Required for all cases other than those identified in Section 17.80.060.A.
C. Permits. The applicant shall apply for and obtain all permits necessary for the construction, installation, and operation of its facilities in the streets. The applicant shall pay all applicable fees due for City permits. All construction and maintenance of any and all of the applicant's Facilities within the Streets incident to the applicant's provision of telecommunications services shall, regardless of who performs installation and/or construction, be and remain the responsibility of the applicant.
D. Installation of Equipment. The applicant's facilities shall be installed and maintained in accordance with the laws of the State of Oregon and the ordinances and standards of the City regulating such construction.
E. Common Users. The applicant's facilities shall be attached to utility poles, light standards, and light poles located within the streets. The applicant shall also allow and encourage other wireless carriers to collocate facilities on the utility poles, light standards, and light poles with the applicant's facilities, provided such collocation does not interfere with the applicant's facilities or jeopardize the physical integrity of the structure and provided the owner of the structure consents to such collocation.
F. Scale of Facilities. This section establishes standards for attaching facilities to utility poles, light standards, and light poles in the streets in a manner that minimizes the facilities' potential incompatibility with adjacent uses.
   1. Facilities may be collocated on existing utility poles, light standards, and light poles, provided:
      a. Facilities do not jeopardize the physical integrity of the utility pole, light standard, or light pole;
      b. Triangular "top hat" style antenna mounts are prohibited;
      c. The device used to mount the facilities does not project more than ten (10) feet above the utility pole, light standard, or light pole;
      d. Antennas will be mounted flush with the devised referenced in Section 17.80.060.F.1.c or the existing utility pole, light standard, or light pole, within a unicell-style top cylinder, or on davit arms that are no greater than five (5) feet in length as measured from the center of the utility pole, light standard, or light pole;
      e. The visual impact of any facilities located in the streets must by minimized by utilizing the smallest antennas, equipment, and equipment cabinets available that will satisfy engineering requirements and the service objectives of the site. Whenever possible, facilities shall be painted or otherwise treated architecturally so as to minimize visual impacts;
      f. All antennas, cabling, mounting hardware, and associated microcell/equipment cabinets mounted on an existing utility pole, light standard, or light pole must be painted to match the color of the utility pole, light standard, or light pole. If cabinets require a special heat-reducing paint finish, they must be a neutral color such as beige, off-white, or light gray; and
      g. The existing utility pole, light standard, or light pole is not replaced with a taller utility pole, light standard, or light pole, except as authorized in Section 17.80.060.F.2.
   2. Replacement Utility Poles, Light Standards, and Light Poles. For purposes of this Section, "replacement utility poles, light standards, and light poles" shall mean a utility pole, light standards, or light pole that a) replaces an existing or original utility pole, light standard, or light pole to accommodate Facilities; and b)

does not result in an increase in the total number of utility, guy, or support poles in the Streets. Facilities may be attached to replacement utility poles, light standards, and light poles in the streets, provided:

a. The replacement utility poles, light standards, and light poles are of sufficient integrity to support the Facilities;
b. The replacement utility poles, light standards, and light poles, and any subsequent replacements, are no more the twenty (20) feet taller than the original utility pole, light standard, or light pole; and
c. The utility pole, light standard, or light pole the replacement utility pole, light standard, or light pole replaces is promptly removed.

3. The applicant shall not locate any facilities, such as cabinets, at grade within the streets, but may connect its facilities in the streets to facilities located on property adjacent to the streets in accordance with applicable City codes and with the permission of the adjacent property owner.

17.80.70 Construction or Modification of a Support Tower.

A. Site Plan and Design Review. Required if the following exists:
   1. Property is zoned GI, CI, I, C, MUC-2 or MUE; and
   2. No adjacent parcel is zoned for residential use.
B. Conditional Use Review. Required for all cases other than those identified in Section 17.80.070.A.
C. Prohibited Zoning Districts and Locations. No new support towers shall be permitted within the Canemah Historic Neighborhood, McLoughlin Conservation District, The Oregon Trail-Barlow Road Historic Corridor, 500 feet of the Willamette Greenway Corridor, or any new Historic Districts unless the applicant can demonstrate that failure to allow the support tower would effectively prevent the provision of communication services in that area. If the applicant makes such a demonstration, the minimum height required to allow that service shall be the maximum height allowed for the tower.

17.80.80 Site Review Process.

No wireless communications facilities, as defined in Section 17.80.020, may be constructed, collocated, modified to increase height, installed, or otherwise located within the City except as provided in this section. Depending on the type and location of the wireless communication facility, the facility shall be subject to the following review unless collocation or an increase in height was granted through a prior land use process. A Conditional Use Review shall require Site Plan and Design Review to occur concurrently with the Conditional Use Review process.

A. Compatibility Review. A wireless communication facility that, pursuant to Sections 17.80.030 – 17.80.050, is subject to a Compatibility Review shall be processed in accordance with Standards of Section 17.80.110. The criteria contained in Section 17.80.110 shall govern approval or denial of the Compatibility Review application. No building permit shall be issued prior to completion of the Compatibility Review process.
B. Site Plan and Design Review. A wireless communication facility that, pursuant to Sections 17.80.040 – 17.80.070, is subject to Site Plan and Design Review shall be processed in accordance with the Standards of Section 17.80.110 and Chapter 17.62, as applicable. The criteria contained in Section 17.80.110 and Chapter 17.62 shall govern approval or denial of the Site Plan and Design Review application. In the event of a conflict in criteria, the criteria contained in this Chapter shall govern. No building permit shall be issued prior to completion of the Site Plan and Design Review process, including any local appeal.
C. Conditional Use Review. A wireless communication facility that, pursuant to Sections 17.80.050 – 17.80.070, is subject to Conditional Use Review, shall be processed in accordance with the Standards of Section 17.80.110 and Chapter 17.56, as applicable. The criteria contained in Section 17.80.110 and Chapter 17.56 shall govern approval or denial of the Conditional Use Review application. In the event of a conflict in criteria, the criteria contained in this Chapter shall govern. No building permit shall be issued prior to completion of the Conditional Use Review process, including any local appeal.

17.80.90 Permit Application Requirements.

A. Compatibility Review Requirements – For an application under Sections 17.80.030.B.7, 17.80.040.A or 17.80.050.A, the following information is required:
   1. Application fee(s).

2. Planning Division land use application form;
3. A narrative of the proposed project that includes a description of the following:
   i. Need for the project;
   ii. Rationale and supporting evidence for the location; and
   iii. Description of the project design and dimensions.
   iv.A written response demonstrating compliance with each criterion listed in OCMC Chapter 17.80.110
4. Documentation demonstrating compliance with non-ionizing electromagnetic radiation (NIER) emissions standards as set forth by the Federal Communications Commission (FCC) particularly with respect to any habitable areas within the structure on which the antenna(s) are collocated on or in structures directly across from or adjacent to the antenna(s);
5. Documentation that the auxiliary support equipment shall not produce sound levels in excess of standards contained in Section 17.80.110.G, or designs showing how the sound is to be effectively muffled to meet those standards;
6. Signature of the property owner(s) on the application form or a statement from the property owner(s) granting authorization to proceed with building permit and land use process;
7. Documentation of the integrity of the support tower, support structure, utility pole, light standard, or light pole to safely handle the load created by the collocation;
8. Elevations showing all improvements and connections to utilities; and
9. Color simulations of the site after construction demonstrating compatibility.

B. Site Plan and Design Review. For an application under Sections 17.80.040.B, 17.80.050.B, 17.80.060.A, or 17.80.070.A the following information is required:
1. The information required in OCMC Chapter 17.80.90.A;
2. Pre-application notes;
3. A written response demonstrating compliance with each criterion listed in the Site Plan and Design Review Standards of Chapter 17.62.050 and all other applicable criterion as defined by the Community Development Director; and
4. Supplemental requirements listed in OCMC Chapter 17.80.90.D as needed.

C. Conditional Use Review. For an application under Sections 17.80.050.C, 17.80.060.B, or 17.80.070.B the following information is required:
The information required in OCMC Chapter 17.80.90.A;
1. Pre-application notes;
2. A written response demonstrating compliance with each criterion listed in the Site Plan and Design Review Standards of Chapter 17.62.050, 17.56, and all other applicable criterion as defined by the Community Development Director as applicable
3. For an application under Section 17.80.070. Construction of Modification of a Support Tower, the requirements listed under Section 17.80.090.D Supplemental Information are required;
4. Responses to Conditional Use Review criteria under Chapter 17.56.010;
5. For an application under Section 17.80.050.C Collocation of Additional Antenna(s) on Support Structures, rationale for being unable to collocate in areas identified in Sections 17.80.050.A and B shall be provided;
6. For an application under Section 17.80.060.B Collocation of Additional Antenna(s) on Utility Poles, Light Standards, and Light Poles, rationale for being unable to collocate in areas identified in Section 17.80.060.A shall be provided; and
7. For an application under Section 17.80.070.B Construction or Modification of a Support Tower, rationale for being unable to collocate in areas identified in Section 17.80.070.A shall be provided.
8. Supplemental information listed in OCMC Chapter 17.80.90.D.

D. Supplemental Information. The applicant shall submit the following information for all applications subject to Conditional Use and Site Plan and Design Review:
1. The capacity of the support tower in terms of the number and type of antennas it is designed to accommodate;
2. A signed agreement, as supplied by the City, stating that the applicant shall allow collocation with other users, provided all safety, structural, technological, and monetary requirements are met. This agreement shall also state that any future owners or operators will allow collocation on the tower.
3. Documentation demonstrating that the Federal Aviation Administration has reviewed and approved the proposal, and Oregon Aeronautics Division has reviewed the proposal. Alternatively, a statement

documenting that notice of the proposal has been submitted to the Federal Aviation Administration and Oregon Aeronautics Division may be submitted. The review process may proceed and approval may be granted for the proposal as submitted, subject to Federal Aviation Administration approval. If Federal Aviation Administration approval requires any changes to the proposal as initially approved, then that initial approval shall be void. A new application will need to be submitted, reviewed, and approved through an additional Site Plan and Design Review or Conditional Use Review process. No building permit application shall be submitted without documentation demonstrating Federal Aviation Administration review and approval and Oregon Aeronautics Division review.

4. A visual study containing, at a minimum, a graphic simulation showing the appearance of the proposed tower, antennas, and auxiliary support equipment from at least 5 points within a 1-mile radius. Such points shall be chosen by the provider with a review and approval by the Community Development Director to ensure that various potential views are represented.
5. Documentation that one or more wireless communications service providers will be using the support tower within sixty (60) days of construction completion.
6. A site plan, drawn to scale, that includes:
   a. existing and proposed improvements;
   b. adjacent roads;
   c. parking, circulation, and access;
   d. connections to utilities, right-of-way cuts required, and easements required;
   e. a landscape plan describing the maintenance plan and showing areas of existing and proposed vegetation to be added, retained, replaced, or removed; and
   f. setbacks from property lines or support structure edges of all existing and proposed structures. Plans that have been reduced, but have not had their scale adjusted, will not be accepted as satisfying this requirement.
7. An alternatives analysis for new support towers demonstrating compliance with the Support Tower Location Requirements of Chapter 17.80.100.

17.80.100 Support Tower Location Requirements.

No new support tower shall be permitted under the provisions of Chapter 17.80.070 unless the applicant demonstrates to the satisfaction of the Community Development Director, and the results are verified by a State of Oregon certified professional engineer, that no existing collocation or modification possibility can accommodate the service needs of the applicant's proposed support tower. All proposals for new support towers must be accompanied by a statement and documentation from a qualified engineer, as determined by the Community Development Director, that the necessary service cannot be provided by collocation on, or modification to, an existing support tower or structure for one or more of the following reasons:

A. No existing support towers or support structures are located within the geographic area required to meet the applicant's engineering requirements;
B. Existing support towers or support structures are not of sufficient height to meet the applicant's engineering requirements;
C. Existing support towers or support structures do not have sufficient structural strength to support the applicant's proposed antenna(s) and related equipment.
D. The applicant's proposed antenna would cause electromagnetic interference with the antenna(s) on the existing support tower or support structure, or the existing antenna would cause interference with the applicant's proposed antenna(s);
E. The applicant demonstrates that there are other limiting factors that render existing support towers and support structures unsuitable; or
F. That fees, costs, or contractual provisions required by the owner in order to share or adapt to an existing support tower or support structure for collocation are unreasonable.

17.80.110 Design Standards.

Installation, collocation, construction, or modification of all support towers, structures, and antennas shall comply with the following standards, unless an adjustment is obtained pursuant to the provisions of Section 17.80.120.

A. Support Tower. The support tower shall be self-supporting.

B. Height Limitation. Support tower and antenna heights shall not exceed the maximum heights provided below.
1. If the property is zoned GI, CI or I; and no adjacent parcel is zoned residential the maximum height of a support tower, including antennas, is 120 feet.
2. If the property is zoned: a. GI, CI or I, and an adjacent parcel is zoned residential; or b. C, MUC-2 or MUE; the maximum height of a support tower, including antennas, is 100 feet.
3. If the property is zoned MUC-1, MUD or NC; the maximum height of a support tower, including antennas, is 75 feet.
4. For all cases other than those identified in Section 17.80.110.B.1-3 above, the maximum height of a support tower, including antennas, is 75 feet.

C. Collocation. New support towers shall be designed to accommodate collocation of additional providers.
1. New support towers of a height greater than 75 feet shall be designed to accommodate collocation of a minimum of two additional providers either outright or through future modification of the tower.
2. New support towers of a height between 60 feet and 75 feet shall be designed to accommodate collocation of a minimum of one additional provider either outright or through future modification of the tower.

D. Setbacks. The following setbacks shall be required from property lines, not the lease area, for support towers, auxiliary support equipment, and perimeter fencing.
1. Support towers not designed to collapse within themselves shall be setback from all property lines a distance equal to the proposed height of the support tower.
2. Support towers designed to collapse within themselves shall be setback from the property line a distance equal to the following:
   a. If the property is zoned GI, CI, I, C, MUC-2 or MUE; and no adjacent parcel is zoned for a residential use the underlying zone setback shall apply;
   b. If the property is zoned:
      i. GI, CI, I, C, MUC-2 or MUE and an adjacent parcel is zoned residential; or
      ii. MUC-1, MUD or NC;the setback shall be a minimum of 25 feet from all adjacent residentially zoned property lines and the underlying zoning setback for all other adjacent property lines; or
   c. For all cases other than those identified in Section 17.80.110.D.2.a and b above, the setback shall be a minimum of 25 feet from all adjacent property lines.

E. Auxiliary Support Equipment. The following standards shall be required.
1. If the property is zoned:
   a. For GI, CI, I, MUC-1, MUC-2, C, MUD, MUE or NC, the auxiliary support equipment footprint shall not exceed an area of 340 square feet and 15 feet in height at the peak;
   b. For all cases other than those identified in Section 17.80.110.E.1.a above, the auxiliary support equipment shall be:
      i. Located underground or completely screened by landscaping or an architecturally significant masonry wall. The wall shall be finished with brick, stone, or stucco. The Community Development Director may approve an alternate screening material if it is compatible with adjacent development and is architecturally significant. No exposed CMU is allowed on the exterior of the wall.
2. Only one auxiliary accessory cabinet shall be allowed per service provider located on a support structure.

F. Landscaping. In all zoning districts, existing vegetation shall be preserved to the maximum extent practicable. Screening of a site is mandatory.
1. If the property is zoned:
   a. GI or CI, and no adjacent parcel is zoned residential, landscaping may not be required if water quality issues are addressed and appropriate screening around the facility is proposed;
   b. For all cases other than those identified in Section 17.80.110.F.1.a above, landscaping shall be placed completely around the perimeter of the wireless communication facility, except as required to gain access. The minimum planting height shall be a minimum of 6 feet at the time of planting, densely placed so as to screen the facility. The landscaping shall be compatible with vegetation in the surrounding area, and shall be kept healthy and well maintained as long as the facility is in operation. Failure to maintain the site will be grounds to revoke the ability to operate the facility.
   c. The Community Development Director may approve an alternative landscaping plan that visually screens the facility and is consistent with the intent of this standard.

G. Noise Reduction. Noise generating equipment shall be baffled to reduce sound level measured at the property line to the following levels except during short durations for testing and operation of generators in emergency situations:

1. For any property where no adjacent parcel is zoned residential, the sound level at the property line shall not be greater than 50 dB;
2. For all other cases, the sound level shall not be greater than 40 dB when measured at the nearest residential parcel's property line.

H. Lighting.
   1. Unless required by the Federal Aviation Administration or the Oregon Aeronautics Division, artificial lighting of wireless communication towers and antennas shall be prohibited.
   2. Strobe lighting is prohibited unless required by the Federal Aviation Administration.
   3. Security lighting for equipment shelters or cabinets and other on-the-ground auxiliary equipment shall be initiated by motion detecting lighting. The lighting shall be the minimal necessary to secure the site, shall not cause illumination on adjacent properties in excess of a measurement of 0.5 footcandles at the property line, and shall be shielded to keep direct light within the site boundaries.

I. Color.
   Unless otherwise required by the Federal Aviation Administration, all support towers and antennas shall have a non-glare finish and blend with the natural background.

J. Signage.
   Support towers and antenna(s) shall not be used for signage, symbols, flags, banners, or other devices or objects attached to or painted on any portion of a wireless communication facility.

K. Access Drives.
   1. On a site with an existing use, access shall be achieved through use of the existing drives to the greatest extent practicable. If adequate intersection sight distance is unavailable at the existing access intersection with a City Street, an analysis of alternate access sites shall be required.
   2. Site shall be serviced by an access adequate to ensure fire protection of the site.
   3. New access drives shall be paved a minimum of 20 feet deep from the edge of the right-of-way (though the use of pervious paving materials such as F-mix asphalt, pavers, or geotech webbing is encouraged) and designed with material to be as pervious as practicable to minimize stormwater runoff.
   4. New access drives shall be reviewed for adequate intersection sight distances.

L. Informing the City. All service providers with facilities within the City of Oregon City shall be required to report in writing to the Community Development Director any changes in the status of their operation.
   1. An annual written statement shall be filed with the Planning Manager verifying continued use of each of their facilities in the City's jurisdiction as well as continued compliance with all state and federal agency regulations.
   2. The report shall include any of the following changes:
      a. Changes in or loss of Federal Communication Commission license from the Federal Communication Commission to operate;
      b. Receipt of notice of failure to comply with the regulations of any other authority over the business or facility;
      c. Change in ownership of the company that owns wireless communication facility or provides telecommunications services; or
      d. Loss or termination of lease with the telecommunications facility for a period of six (6) months or longer.

17.80.120 Adjustments.

Adjustments to the standards of this chapter may be approved by the Planning Commission at a duly noticed public hearing. The Planning Commission may grant an adjustment under either of the following circumstances:

1. The Planning Commission may grant an adjustment when a gap in the applicant's service exists and the gap can only be alleviated through the adjustment of one of more of the standards in this section. If an adjustment is to be approved, the applicant must demonstrate each of the following:
   a. A gap in coverage or capacity exists in the wireless communication provider's service network that results in network users being regularly unable to connect with the provider's network, or maintain connection;
   b. The proposed facility will fill the existing service gap. The gap would be filled if the proposed facility would substantially reduce the frequency with which users of the network are unable to connect, or maintain connection, with the provider's network; and

c. The gap cannot be filled through collocation on existing facilities, or establishment of facilities that are consistent with the standards of this section on properties other than the proposed site or on the proposed site in a manner which does not require an adjustment under this subsection.

2. The Planning Commission may grant an adjustment to a standard when the proposed adjustment would utilize existing site characteristics to minimize demonstrated or potential impacts on the use of surrounding properties. For the purposes of this subsection, site characteristics shall include, but need not be limited to, the suitability of the proposed use considering size, shape, location, topography, existence of improvements, and natural features. Applicants for an adjustment under this provision must demonstrate that the adjustment will result in a lower level of impact on surrounding properties than would be generated if the standard were not adjusted. In considering the requested adjustment, the Planning Commission may consider the following:
   a. Visual impacts;
   b. Impacts on views;
   c. Impacts on property values; and
   d. Other impacts that the Planning Commission finds can be mitigated by an adjustment so that the proposed use will have greater compliance in not altering the character of the surrounding area in a manner which substantially limits, impairs, or precludes the use of surrounding properties for the primary use listed in the underlying district.
3. Requests for adjustments under this subsection shall only be considered concurrently with the applicable Site Review Process as required by Section 17.80.080. If the Site Review Process required by Section 17.80.080 is a Compatibility Review or a Site Plan and Design Review, the inclusion of an adjustment will require that the application be subject to a Conditional Use Review under Section 17.80.090.C.

17.80.130 Temporary Facilities.

In order to facilitate continuity of services during maintenance or repair of existing installations, or prior to completion of construction of a new wireless communication facility, temporary wireless communication facilities shall be allowed subject to a Type I administrative review. Temporary wireless communication facilities shall not be in use in excess of six (6) month period. Temporary wireless communication facilities shall not have a permanent foundation, and shall be removed within thirty (30) days of suspension of service they provide.

17.80.140 Removal for Discontinuance of Service.

Any wireless communication facility that has not provided service for six (6) months shall be deemed a nuisance and subject to removal as provided in Oregon City Municipal Code Chapter 8.08. The Planning Manger may grant a six (6) month extension where a written request has been filed, within the initial six (6) months period, to reuse the support tower or antenna(s).

17.80.150 Fees.

Notwithstanding any other provisions of this code, the Community Development Director may require, as part of the application fees for land use permits, an amount sufficient to recover all of the City's costs in retaining consultants to verify statements made in conjunction with the permit application, to the extent that verification requires telecommunication experts.

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& DEVELOPMENT
635 CAPITOL ST NE, STE. 150
SALEM, OR 97301-2540

PRESERVING OUR PAST, BUILDING OUR FUTURE

ORDINANCE NO. 08-1014

AN ORDINANCE ADOPTING REVISIONS TO THE OREGON CITY COMPREHENSIVE PLAN MAP AND ZONING MAP AND ADOPTING AMENDMENTS TO THE OREGON CITY MUNICIPAL CODE

WHEREAS, Oregon City residents and public advisory groups have worked with the City to develop the revisions and refinements to the overall vision, policies and goals for the future growth and development of Oregon City through the revisions to the City's Comprehensive Plan and implementing ordinances; and

WHEREAS, code amendments are necessary to implement the Beavercreek and Park Place Concept Plans, Metro's Nature in the Neighborhoods (Title 13) program and provide for general updates to the Oregon City Zoning and Development Codes and to the Oregon City Comprehensive Plan Map and Zoning Map.

WHEREAS, the Oregon City Planning Commission held series of publicly noticed work sessions from February through August 2008 to review proposed amendments to the Oregon City Zoning and Development Codes and held hearings from August 25, 2008 to November 24, 2008 to take testimony and evidence on the Comprehensive Plan and Plan Map, as well as the Zoning and Development Codes in order to make revisions or refinements to the documents adopted in Ordinance No. 08-1014; and

WHEREAS, the Oregon City City Commission held two publicly noticed work sessions in March and April of 2009 to review proposed amendments to the Oregon City Zoning and Development Codes and held hearings in May and June of 2009 to take testimony and evidence on the Comprehensive Plan and Plan Map, as well as the Zoning and Development Codes in order to make revisions or refinements to the documents adopted in Ordinance No. 08-1014; and

WHEREAS, the Comprehensive Plan and Map is intended to guide the management of the City's assets, to support natural, recreational, and economic benefits for the community of Oregon City, and to provide a framework for implementation of identified goals and policies; and

WHEREAS, the Comprehensive Plan and Map and it's Ancillary Documents complies and is consistent with state statutes, Statewide Planning Goals, Downtown Community Plan, Water Front Master Plan, and the Metro Regional Framework Plan; and

WHEREAS, the amended Zoning and Development Codes and Zoning Map complies and is consistent with state statutes, Statewide Planning Goals, the amended Oregon City Comprehensive Plan, the Downtown Community Plan, the Metro Regional Framework Plan, the Oregon City Transportation System Plan, and the Oregon City Park and Recreation Master Plan; and

WHEREAS, the Planning Commission, based on the oral and written testimony they received at the public hearings, adopted minor revisions to the Comprehensive Map, Zoning and Development Code and Zoning Map and unanimously recommended that the City Commission adopt the revisions; and

WHEREAS, the City Commission, based on the oral and written testimony they received at the public hearings, adopted minor revisions to the Comprehensive Plan, Comprehensive Map, Zoning and Development Code and Zoning Map and unanimously recommended that the City Commission adopt the revisions; and

WHEREAS, on November 9, 2009, the Planning Commission and January 20, 2010, the City Commission will hold hearings to review any outstanding issues or updates needed to implement the intent of this Ordinance.

WHEREAS, adopting the revisions to the Comprehensive Plan, Comprehensive Plan Map, Zoning and Development Code and Zoning Map is in the best interest of Oregon City to ensure that the goals and policies of the City can be realized,

NOW, THEREFORE, OREGON CITY ORDAINS AS FOLLOWS:

Section 1. Oregon City Zoning and Development Codes are hereby amended, as provided in Exhibit 1, based on the findings contained in the Staff Report.

Section 2. The Oregon City Comprehensive Plan Map, attached as Exhibit 2, is hereby adopted based on the findings contained in the Staff Report.

Section 3. The Oregon City Zoning Map, attached as Exhibit 3, is hereby adopted based on the findings contained in the Staff Report.

Read for the first and second time at a regular meeting of the City Commission held on the 1st day of July 2009, and the foregoing ordinance was finally enacted by the City Commission this 1st day of July 2009.

Alice Norris

ALICE NORRIS, Mayor

ATTESTED to this 1st day of July 2009

Nancy Ide

NANCY IDE, City Recorder

Oregon City Municipal Code
Chapter 2.60 Property Compensation- Process and Standards

2.60.010 Purpose.

The purpose of this Chapter is to establish a procedure by which owners of private real property located within the City of Oregon City may file claims pursuant to Chapters 195 and 197 of the Oregon Revised Statutes as amended by Ballot Measure 49 (November 6, 2007) (referred to in this chapter as "Measure 49") and to provide for consideration of claims by the City Commission.

2.60.015 Definitions.

A. Appraisal. A written statement prepared by a person certified under ORS chapter 674 or a person registered under ORS chapter 308 that complies with the Uniform Standards of Professional Appraisal Practice, as authorized by the Financial Institution Reform, Recovery and Enforcement Act of 1989.
B. Department. The Oregon Department of Land Conservation and Development.
C. Exempt Land Use Regulation. A land use regulation that:
   1. Restricts or prohibits activities commonly and historically recognized as public nuisances under common law;
   2. Restricts or prohibits activities for the protection of public health and safety;
   3. Is required in order to comply with federal law; or
   4. Restricts or prohibits the use of property for the purpose of selling pornography or performing nude dancing.
D. Land Use Regulation. A provision of the City of Oregon City Comprehensive Plan, zoning ordinance or land division ordinance that restricts the residential use of private real property zoned for residential use.
E. Owner. A person who is:
   1. The owner of fee title to the property as shown in the deed records of the county where the property is located;
   2. The purchaser under a land sale contract, if there is a recorded land sale contract in force for the property; or
   3. If the property is owned by the trustee of a revocable trust, the settlor of a revocable trust, except that when the trust becomes irrevocable, only the trustee shall be deemed the owner.
F. Program Manager. The person authorized to administer and oversee the processing of claims under this Chapter.
G. Protection of Public Health and Safety. A law, rule, ordinance, order, policy or permit or other governmental authorization that restricts a use of property in order to reduce the risk or consequence of fire, earthquake, landslide, flood, storm, pollution, disease, crime or other natural or human disaster or threat to persons or property including, but not limited to, building and fire codes, health and sanitation regulations, solid or hazardous waste regulations and pollution control regulations.
H. Reduction in Value. A decrease in fair market value of the property from the date that is one year before the enactment of the land use regulation to the date that is one year after enactment, plus interest, adjusted by any ad valorem property taxes not paid as a result of any special assessment of the property under ORS 308A.050 to 308A.128, 321.257 to 321.390, 321.754 or 321.805 to 321.855, plus interest, offset by any severance taxes paid by the claimant and by any recapture of potential additional tax liability that the claimant has paid or will pay for the property if the property is disqualified from special assessment under ORS 308A.703.
I. Waiver. Action by the City Commission to modify, remove or not apply one or more land use regulations found to have caused a reduction in value.

2.60.020 Filing a Claim.

A. A person may file a claim after June 28, 2007, and will qualify for compensation or waiver, if:
   1. The claimant is an owner of the property and all owners of the property have consented in writing to filing of the claim;
   2. The claimant's desired use of the property is a residential use;
   3. The claimant's desired use of the property is restricted by a land use regulation enacted after January 1, 2007;
   4. The enactment of the land use regulation has reduced the fair market value of the property; and
   5. The highest and best use of the property was residential use at the time the land use regulation was enacted.

B. A person filing a claim under this section must submit the fee for processing the claim prescribed in Section 2.60.060 and the following information:
   1. The name, street address and telephone number of the claimant and all other owners of the property;
   2. A title report issued no more than 30 days prior to submission of the claim that shows the claimant's current real property interest in the property; the deed registry of the instrument by which the claimant acquired the property; the location and street address and township, range, section and tax lot number(s) of the property; the date on which the owner acquired the property interest; and any exceptions and encumbrances to title;
   3. A written statement signed by all owners of the property consenting to the filing of the claim;
   4. A citation to the land use regulation the claimant believes is restricting the claimant's desired use of the property;
   5. A description of the specific single-family residential use of the property that the claimant desires to carry out, but cannot because of the land use regulations;
   6. An appraisal showing the fair market value of the property one year before the enactment of the land use regulation and one year after enactment, and expressly determining the highest and best use of the property at the time the land use regulation was enacted;
   7. If the property is or has been enrolled in one or more of the special assessment programs listed in Measure 49, Section 9(6), information regarding taxes not paid as a result of the program or programs; and
   8. A statement whether the claimant filed a claim with other public entities on or before June 28, 2007, involving the same property and a copy of any decision made by the entity on the claim.

C. A person filing a claim under this section must file the claim within five years after the challenged land use regulation was enacted.

2.60.025 Review of Claim by Program Manager.

A. The Program Manager shall review the claim to ensure that it provides the information required by Section 2.60.030. If the Program Manager determines that the claim is incomplete, the Program Manager shall, within 60 days after the filing of the claim, provide written notice of the incompleteness to the claimant. If the Program Manager does not notify the owner that the claim is incomplete within the prescribed 60 days, the claim shall be considered complete on the date it was filed with the Program Manager.

B. A claim filed under this section shall not be considered complete until the claimant has submitted the information required by this section. If the claimant fails to submit a complete claim within 60 days after the notice prescribed in Subsection A, the claim shall be deemed withdrawn.

C. The Program Manager shall conduct a preliminary review of a claim to determine whether it satisfies all of the following prerequisites for full evaluation of the claim:
   1. The property lies within Oregon City's jurisdictional boundary;
   2. The land use regulation that is the basis for the claim is a provision of a city land use regulation; and
   3. The claimant acquired an interest in the property before the effective date of the land use regulation and has continued to have an interest in the property since the effective date.

D. If the claim fails to satisfy one or more of the prerequisites in subsection C of this section, the Program Manager shall prepare a report to that effect and recommend to the City Commission that it dismiss the claim following a public hearing under Section 2.60.050.

E. If the claim satisfies each of the prerequisites in Subsection C of this section, the Program Manager shall complete the review of the claim to determine whether it satisfies the criteria in Section 2.60.030(A).
F. The Program Manager may commission an appraisal or direct other research in aid of the determination whether a claim meets the requirements of ORS 197.352 and to assist in the development of a recommendation regarding appropriate relief for a valid claim.
G. The Program Manager shall prepare a written report with the determinations required by Subsection E of this section and the reasoning to support the determination. The report shall include a recommendation to the City Commission on the validity of the claim and, if valid, whether Oregon City should compensate the claimant for the reduction of value or waive the regulation. If the Program Manager recommends compensation or waiver, the report shall recommend any conditions that should be placed upon the compensation or waiver to help achieve the purpose of this chapter and the policies of Oregon City's comprehensive plan. If the Program Manager recommends waiver, the report shall recommend the specific number of single-family dwellings Oregon City should authorize commensurate to the reduction in fair market value of the property.
H. The Program Manager shall provide the report to the City Commission, the claimant, Metro, and other persons who request a copy.

2.60.030 Hearing on Claim by City Commission.

A. The City Commission shall hold a public hearing on a claim prior to its final determination. The Program Manager shall schedule the hearing for a date within 180 days after the filing of a completed claim.
B. The Program Manager shall provide notice of the date, time and location of the public hearing at least 30 days before the hearing to the claimant and owners of the subject property, owners and occupants of property within 100 feet of the subject property, the Department, Metro, and Clackamas County. The notice shall indicate that:
   1. A copy of the Program Manager's recommendation is available upon request;
   2. Judicial review of Oregon City's final determination is limited to the written evidence and arguments submitted to Oregon City prior to or at the public hearing; and
   3. Judicial review is available only for issues that are raised with sufficient specificity to afford Oregon City an opportunity to respond in its final determination.
C. After the close of the public hearing, the City Commission shall makes its final determination on the claim and enter an order with findings of fact and conclusions of law, based upon the record made before the City Commission, that explain the determination. The Program Manager shall mail a copy of the final determination to the claimant, Clackamas County, and any person who submitted written or oral testimony prior to the close of the public hearing.
D. The City Commission will make its final determination within 180 days of the date the claim is complete.

2.60.035 Claim Processing Fee.

A claimant shall pay a $250 fee to file a claim under Sections 2.60.030 of this Chapter. A claim will not be considered complete until the fee is paid.

2.60.040 Determination of Common Law Vested Right.

A. A person with an approved Measure 37 claim may apply for a determination that the person has a common law vested right to continue and complete a use or development allowed by an approved Measure 37 claim consistent with Measure 49.
B. An applicant seeking to establish a common law vested right for an approved Measure 37 claim must submit the following information:
   1. The name, mailing address, and telephone number of the applicant.
   2. A legal description and tax lot numbers of the subject property as well as a street address for the property, if any.

3. A copy of the approved Measure 37 claim decision from Oregon City and, if appropriate, the State of Oregon.
4. Additional information sufficient to address each of the factors listed in Subsection C of this Section.

C. The factors to be considered by the Program Manager and the City Commission in determining whether the applicant has a common law vested right to continue and complete a use or development allowed by an approved Measure 37 claim are:
1. The amount of money spent on developing the use in relation to the total cost of establishing the use.
2. The good faith of the property owner.
3. Whether the property owner had notice of the proposed change in law before beginning development,
4. Whether any improvements could be used for other allowed uses.
5. The kind of use, and the location and cost of the development.
6. Whether the property owner's acts are more than mere contemplated use or preparation, such as the leveling of land, boring test holes, or preliminary negotiations with contractors or architects.
7. Other relevant factors.

D. The Program Manager shall review the application to ensure that it provides the information required by Subsections B and C of this Section. If the Program Manager determines that the application is incomplete, the Program Manager shall, within 30 days after the filing of the application, provide written notice of the incompleteness to the applicant. If the applicant fails to respond or submit the missing information within 30 days of the date of the Program Manager's notice, the application shall be considered complete on the date it was filed with the City.

E. The Program Manager shall prepare a written report with the determinations required by Subsections B and C of this section and the reasoning to support the determination. The report shall include a recommendation to the City Commission on whether the applicant has established a common law vested right to continue and complete a use or development allowed by an approved Measure 37 claim.

F. The Program Manager shall provide the report to the City Commission, the claimant, Metro, and other persons who request a copy.

2.60.045 Hearing on a Common Law Vested Right By City Commission.

A. The City Commission shall hold a public hearing on an application for a common law vested right to continue and complete a use or development allowed by an approved Measure 37 claim prior to its final determination. The Program Manager shall schedule the hearing for a date within 90 days after the filing of a completed application.

B. The Program Manager shall provide notice of the date, time and location of the public hearing at least 30 days before the hearing to the applicant and owners of the subject property, owners and occupants of property within 100 feet of the subject property, and the Department. The notice shall indicate that:
1. A copy of the Program Manager's recommendation is available upon request;
2. Judicial review of Oregon City's final determination is limited to the written evidence and arguments submitted to the City prior to or at the public hearing; and
3. Judicial review is available only for issues that are raised with sufficient specificity to afford the City an opportunity to respond in its final determination.

C. After the close of the public hearing the City Commission shall make its final determination on the application and enter an order with findings of fact and conclusions of law, based upon the record made before the City Commission, that explain the determination. The Program Manager shall mail a copy of the final determination to the claimant, the Department, and any person who submitted written or oral testimony prior to the close of the public hearing.

D. The City Commission shall make its final determination within 120 days of the date the claim is complete.

Oregon City Municipal Code
Chapter 12.04 Streets Sidewalks and Public Places

12.04.010 Jurisdiction and management of the public rights-of-way.

A. The city has jurisdiction and exercises regulatory management over all public rights-of-way within the city under authority of the City Charter and state law.
B. Public rights-of-way include, but are not limited to, streets, roads, highways, bridges, alleys, sidewalks, trails, paths, public easements and all other public ways or areas, including the subsurface under and air space over these areas.
C. The city has jurisdiction and exercises regulatory management over each public right-of-way whether the city has a fee, easement, or other legal interest in the right-of-way. The city has jurisdiction and regulatory management of each right-of-way whether the legal interest in the right-of-way was obtained by grant, dedication, prescription, reservation, condemnation, annexation, foreclosure or other means.
D. No person may occupy or encroach on a public right-of-way without the permission of the city. The city grants permission to use rights-of-way by franchises and permits.
E. The exercise of jurisdiction and regulatory management of a public right-of-way by the city is not official acceptance of the right-of-way, and does not obligate the city to maintain or repair any part of the right-of-way.

12.04.015 Street Design - Purpose and General Provisions.

All development shall be in conformance with the policies and design standards established by this chapter and with applicable standards in the City 's Public Facility Master Plan and City design standards and specifications. In reviewing applications for development, the City Engineer shall take into consideration any approved development and the remaining development potential of adjacent properties. All street, water, sanitary sewer, storm drainage and utility plans associated with any development must be reviewed and approved by the city engineer prior to construction. All streets, driveways or storm drainage connections to another jurisdiction's facility or right-of-way must be reviewed by the appropriate jurisdiction as a condition of the preliminary plat and when required by law or intergovernmental agreement shall be approved by the appropriate jurisdiction.

12.04.020 Street Design--Generally.

The location, width and grade of street shall be considered in relation to: existing and planned streets, topographical conditions, public convenience and safety for all modes of travel, existing and identified future transit routes and pedestrian/bicycle accessways, and the proposed use of land to be served by the streets. The street system shall assure an adequate traffic circulation system with intersection angles, grades, tangents and curves appropriate for the traffic to be carried considering the terrain. To the extent possible, proposed streets shall connect to all existing or approved stub streets that abut the development site. Where location is not shown in the development plan, the arrangement of streets shall either:
A. Provide for the continuation or appropriate projection of existing principal streets in the surrounding area and on adjacent parcels or conform to a plan for the area approved or adopted by the city to meet a particular situation where topographical or other conditions make continuance or conformance to existing streets impractical;
B. Where necessary to give access to or permit a satisfactory future development of adjoining land, streets shall be extended to the boundary of the development and the resulting dead-end street (stub) may be approved with a temporary turnaround as approved by the city engineer. Access control in accordance with section 12.04.200 shall be required to preserve the objectives of street extensions.

12.04.025 Street Design--Minimum Right-of-Way.

All development shall provide adequate right-of-way and pavement width. Adequate right-of-way and pavement width shall be provided by:

A. Complying with the Street Design Standards contained in the table provided in chapter 12.04. The Street Design Standards are based on the classification of streets that occurred in the Oregon City Transportation System Plan (TSP), in particular, the following TSP figures provide the appropriate classification for each street in Oregon City: Figure 5-1: Functional Classification System and New Roadway Connections; Figure 5-3: Pedestrian System Plan; Figure 5.6: Bicycle System Plan; and Figure 5.7: Public Transit System Plan. These TSP figures from the Oregon City Transportation System Plan are incorporated herein by reference in order to determine the classification of particular streets.

Table 12.04.020 STREET DESIGN STANDARDS

Type of Street	**Maximum Right-of-Way Width**	**Pavement Width**
Major arterial	124 feet	98 feet
Minor arterial	114 feet	88 feet
Collector street	86 feet	62 feet
Neighborhood Collector street	81 feet	59 feet
Local street	54 feet	32 feet
Alley	20 feet	16 feet

B. The applicant may submit an alternative street design plan that varies from the Street Design Standards identified above. An alternative street design plan may be approved by the City Engineer if it is found the alternative allows for adequate and safe traffic, pedestrian and bicycle flows and transportation alternatives and protects and provides adequate multi-modal transportation services for the development as well as the surrounding community.

12.04.030 Street Design--Access Control.

A. A street which is dedicated to end at the boundary of the development or in the case of half-streets dedicated along a boundary shall have an access control granted to the City as a City controlled plat restriction for the purposes of controlling ingress and egress to the property adjacent to the end of the dedicated street. The access control restriction shall exist until such time as a public street is created, by dedication and accepted, extending the street to the adjacent property.
B. The City may grant a permit for the adjoining owner to access through the access control.
C. The plat shall contain the following access control language or similar on the face of the map at the end of each street for which access control is required: "Access Control (See plat restrictions)."
D. Said plats shall also contain the following plat restriction note(s): "Access to (name of street or tract) from adjoining tracts (name of deed document number[s]) shall be controlled by the City of Oregon City by the recording of this plat, as shown. These access controls shall be automatically terminated upon the acceptance of a public road dedication or the recording of a plat extending the street to adjacent property that would access through those Access Controls."

12.04.035 Street Design--Alignment.

The centerline of streets shall be:

A. Aligned with existing streets by continuation of the centerlines; or

B. Offset from the centerline by no more than 10 feet, provided appropriate mitigation, in the judgment of the City Engineer, is provided to ensure that the offset intersection will not pose a safety hazard.

12.04.040 Minimum Street Intersection Spacing Standards.

A. All new development and redevelopment shall meet the following Public Street Intersection Spacing Standards:

Table 12.04.040 - Public Street Intersection Spacing Standards

	Distance in Feet between Streets of Various Classifications								
	Between Arterial and Arterial	Between Arterial and Collector	Between Arterial and Neighborhood Collector	Between Arterial and Local Street	Between Collector Street and Collector Street	Between Collector Street and Neighborhood Collector	Between Collector and Local Street	Between Neighborhood Collector and Local Street	Between two adjacent Local Streets
Measured along an Arterial Street	1320	800	600	300	600	300	150	150	150
Measured along a Collector Street	800	800	600	300	600	300	150	150	150
Measured along a Neighborhood Collector Street	800	600	300	300	300	150	150	150	150
Measured along a Local Street	600	600	300	300	300	150	150	150	150

Note: With regard to public intersection spacing standards, the same distances apply to both major arterial and minor arterial streets. In this table, the term "arterial" applies to both major arterial and minor arterial streets.

or

B. A lesser distance between intersections may be allowed, provided appropriate mitigation, in the judgment of the City Engineer, is provided to ensure that the reduction in intersection spacing will not pose a safety hazard.

12.04.045 Street Design--Constrained Local Streets and/or Rights-of-Way.

Any accessway with a pavement width of less than thirty-two feet shall require the approval of the City Engineer, Community Development Director and Fire Chief and shall meet minimum life safety requirements, which may include fire suppression devices as determined by the fire marshal to assure an adequate level of fire and life safety. The standard width for constrained streets is twenty feet of paving with

no on-street parking and twenty-eight feet with on-street parking on one side only. Constrained local streets shall maintain a twenty-foot wide unobstructed accessway. Constrained local streets and/or right-of-way shall comply with necessary slope easements, sidewalk easements and altered curve radius, as approved by the City Engineer and Community Development Director.

Table 12.04.045
STREET DESIGN STANDARDS FOR LOCAL CONSTRAINED STREETS

	Minimum	Required
Type of Street	Right-of-Way	Pavement Width
Constrained local street	30 to 40 feet	20 to less than 32 feet

12.04.050 Intersection Level of Service Standards.

When reviewing new developments, the City of Oregon City requires all relevant intersections to be maintained at the minimum acceptable Level Of Service (LOS) upon full build-out of the proposed development. The minimum acceptable LOS standards are as follows:

A. For signalized intersection areas of the city that are located outside the Regional Center boundaries a LOS of "D" or better for the intersection as a whole *and* no approach operating at worse than LOS "E" *and* a v/c ratio not higher than 1.0 for the sum of critical movements.
B. For signalized intersections within the Regional Center boundaries a LOS "D" can be exceeded during the peak hour; however, during the second peak hour, LOS "D" or better will be required as a whole and no approach operating at worse than LOS "E" *and* a v/c ratio not higher than 1.0.
C. For unsignalized intersection throughout the city a LOS "E" or better for the poorest approach and with no movement serving more than 20 peak hour vehicles operating at worse than LOS "F" will be tolerated for minor movements during a peak hour.

12.04.055 Street design--Intersection Angles.

Except where topography requires a lesser angle, streets shall be laid out to intersect at angles as near as possible to right angles. In no case shall the acute angles be less than eighty degrees unless there is a special intersection design. An arterial or collector street intersecting with another street shall have at least one hundred feet of tangent adjacent to the intersection unless topography requires a lesser distance. Other streets, except alleys, shall have at least fifty feet of tangent adjacent to the intersection unless topography requires a lesser distance. All street intersections shall be provided with a minimum curb return radius of twenty-five feet for local streets. Larger radii shall be required for higher street classifications as determined by the city engineer. Additional right-of-way shall be required to accommodate curb returns and sidewalks at intersections. Ordinarily, intersections should not have more than two streets at any one point.

12.04.060 Street design--Off-Site Street Improvements.

During consideration of the preliminary plan for a development, the decision maker shall determine whether existing streets impacted by, adjacent to, or abutting the development meet the city's applicable planned minimum design or dimensional requirements. Where such streets fail to meet these requirements, the decision-maker shall require the applicant to make proportional improvements sufficient to achieve conformance with minimum applicable design standards required to serve the proposed development.

12.04.065 Street Design--Half Street.

Half streets, while generally not acceptable, may be approved where essential to the development, when in conformance with all other applicable requirements, and where it will not create a safety hazard. When approving half streets, the decision maker must first determine that it will be practical to require the dedication of the other half of the street when the adjoining property is divided or developed. Where the decision maker approves a half street, the applicant must construct an additional ten feet of pavement width so as to make the half street safe and usable until such time as the other half is constructed. Whenever a half street is adjacent to property capable of being divided or developed, the other half of the street shall be provided and improved when that adjacent property divides or develops. Access Control as described in 12.04.200 may be required to preserve the objectives of half streets.

12.04.070 Street Design--Cul-de-sacs and Dead-End Streets.

The City discourages the use of cul-de-sacs and permanent dead-end streets except where construction of a through street is found by the decision maker to be impracticable due to topography or some significant physical constraint such as unstable soils, wetland, natural or historic resource areas, dedicated open space, existing development patterns, or arterial access restrictions. When permitted, cul-de-sacs and permanent dead-end streets shall have a maximum length of three hundred fifty feet, as measured from the right-of-way line of the nearest intersecting street to the back of the cul-de-sac curb face, and include pedestrian/bicycle accessways as provided in Section 17.90.220 of this code and Chapter 12.24. This section is not intended to preclude the use of curvilinear eyebrow widening of a street where needed to provide adequate lot coverage.

Where approved, cul-de-sacs shall have sufficient radius to provide adequate turn-around for emergency vehicles in accordance with Fire District and City adopted street standards. Permanent dead-end streets other than cul-de-sacs shall provide public street right-of-way / easements sufficient to provide turn-around space with appropriate no-parking signs or markings for waste disposal, sweepers, and other long vehicles in the form of a hammerhead or other design to be approved by the decision maker. Driveways shall be encouraged off the turnaround to provide for additional on-street parking space.

12.04.075 Street Design--Street Names.

Except for extensions of existing streets, no street name shall be used which will duplicate or be confused with the name of an existing street. Street names shall conform to the established standards in the City and shall be subject to the approval of the City.

12.04.080 Street Design--Grades and Curves.

Grades and center line radii shall conform to the standards in the City's street design standards and specifications.

12.04.085 Street Design--Development Abutting Arterial or Collector Street.

Where development abuts or contains an existing or proposed arterial or collector street, the decision maker may require: access control; screen planting or wall contained in an easement or otherwise protected by a restrictive covenant in a form acceptable to the decision maker along the rear or side property line; or such other treatment it deems necessary to adequately protect residential properties or afford separation of through and local traffic. Reverse frontage lots with suitable depth may also be considered an option for residential property that has arterial frontage. Where access for development abuts and connects for vehicular access to another jurisdiction's facility then authorization by that jurisdiction may be required.

12.04.090 Street Design--Pedestrian and Bicycle Safety.

Where deemed necessary to ensure public safety, reduce traffic hazards and promote the welfare of pedestrians, bicyclists and residents of the subject area, the decision maker may require that local streets be so designed as to discourage their use by nonlocal automobile traffic.

All crosswalks shall include a large vegetative or sidewalk area which extends into the street pavement as far as practicable to provide safer pedestrian crossing opportunities. These curb extensions can increase the visibility of pedestrians and provide a shorter crosswalk distance as well as encourage motorists to drive slower. The decision maker may approve an alternative design that achieves the same standard for constrained sites or where deemed unnecessary by the City Engineer.

12.04.095 Street Design – Curb Cuts.

To assure public safety, reduce traffic hazards and promote the welfare of pedestrians, bicyclists and residents of the subject area, such as a cul-de-sac or dead-end street, the decision maker shall be authorized to minimize the number and size of curb cuts (including driveways) as far as practicable where any of the following conditions are necessary:

A. To provide adequate space for on-street parking;
B. To facilitate street tree planting requirements;
C. To assure pedestrian and vehicular safety by limiting vehicular access points; and
D. To assure that adequate sight distance requirements are met.

Where the decision maker determines any of these situations exist or may occur due to approval of a proposed development, single residential driveway curb cuts shall be limited to 12 feet in width adjacent to the sidewalk and property line and may extend to a maximum of 18 feet abutting the street pavement to facilitate turning movements. Shared residential driveways shall be limited to 24 feet in width adjacent to the sidewalk and property line and may extend to a maximum of 30 feet abutting the street pavement to facilitate turning movements. Non-residential development driveway curb cuts in these situations shall be limited to the minimum required widths based on vehicle turning radii based on a professional engineer's design submittal and as approved by the decision maker.

12.04.100 Street design--Alleys.

Public alleys shall be provided in the following districts R-5, R-3.5, R-2, MUC-1, MUC-2 and NC zones unless other permanent provisions for private access to off-street parking and loading facilities are approved by the decision maker. The corners of alley intersections shall have a radius of not less than ten feet.

12.04.105 Street Design--Transit.

Streets shall be designed and laid out in a manner that promotes pedestrian and bicycle circulation. The applicant shall coordinate with Tri-Met where the application impacts transit streets as identified on Figure 5.7: Public Transit System Plan of the Oregon City Transportation System Plan. Pedestrian/bicycle access ways shall be provided as necessary in conformance with the requirements in Section 17.90.220 of this code and Chapter 12.24 to minimize the travel distance to transit streets and stops and neighborhood activity centers. The decision maker may require provisions, including easements, for transit facilities along transit streets where a need for bus stops, bus pullouts or other transit facilities within or adjacent to the development has been identified.

12.04.110 Street design--Planter Strips.

All development shall include vegetative planter strips that are five feet in width or larger and located adjacent to the curb. This requirement may be waived or modified if the decision maker finds it is not practicable. The decision maker may permit constrained sites to place street trees on the abutting private

property within 10 feet of the public right-of-way if a covenant is recorded on the title of the property identifying the tree as a city street tree which is maintained by the property owner. Development proposed along a collector, minor arterial, or major arterial street may use tree wells with root barriers located near the curb within a wider sidewalk in lieu of a planter strip, in which case each tree shall have a protected area to ensure proper root growth and reduce potential damage to sidewalks, curbs and gutters.

To promote and maintain the community tree canopy adjacent to public streets, trees shall be selected and planted in planter strips in accordance with Chapter 12.08, Street Trees. Individual abutting lot owners shall be legally responsible for maintaining healthy and attractive trees and vegetation in the planter strip. If a homeowners' association is created as part of the development, the association may assume the maintenance obligation through a legally binding mechanism, e.g., deed restrictions, maintenance agreement, etc., which shall be reviewed and approved by the city attorney. Failure to properly maintain trees and vegetation in a planter strip shall be a violation of this code and enforceable as a civil infraction.

Oregon City Municipal Code
Chapter 12.08 Public and Street Trees

12.08.010 Purpose.

The purpose of this chapter is to:

A. Develop tree-lined streets to protect the living quality and beautify the City;
B. Establish physical separation between pedestrians and vehicular traffic;
C. Create opportunities for solar shading;
D. Improve air quality; and
E. Increase the community tree canopy and resource.

12.08.015 Street Tree Planting and Maintenance Requirements.

All new construction or major redevelopment shall provide street trees adjacent to all street frontages. Species of trees shall be selected based upon vision clearance requirements, but shall in all cases be selected from the Oregon City Street Tree List or be approved by a certified arborist. If a setback sidewalk has already been constructed or the Development Services determines that the forthcoming street design shall include a setback sidewalk, then all street trees shall be installed with a planting strip. If existing street design includes a curb-tight sidewalk, then all street trees shall be placed within the front yard setback, exclusive of any utility easement.

A. One street tree shall be planted for every thirty-five feet of property frontage. The tree spacing shall be evenly distributed throughout the total development frontage. The Community Development Director may approve an alternative street tree plan if site or other constraints prevent meeting the placement of one street tree per thirty-five feet of property frontage.
B. The following clearance distances shall be maintained when planting trees:
    1. Fifteen feet from streetlights;
    2. Five feet from fire hydrants;
    3. Twenty feet from intersections;
    4. A minimum of five feet (at mature height) below power lines.
C. All trees shall be a minimum of two inches in caliper at six inches above the root crown and installed to city specifications.
D. All established trees shall be pruned tight to the trunk to a height that provides adequate clearance for street cleaning equipment and ensures ADA compliant clearance for pedestrians.

12.08.020 Street Tree Species Selection.

The Community Development Director may specify the species of street trees required to be planted if there is an established planting scheme adjacent to a lot frontage, if there are obstructions in the planting strip, or if overhead power lines are present.

12.08.025 General Tree Maintenance.

Abutting property owners shall be responsible for the maintenance of street trees and planting strips. Topping of trees is permitted only under recommendation of a certified arborist, or other qualified professional, if required by city staff. Trees shall be trimmed appropriately. Maintenance shall include trimming to remove dead branches, dangerous limbs and to maintain a minimum seven-foot clearance above all sidewalks and ten-foot clearance above the street. Planter strips shall be kept clear of weeds, obstructing vegetation and trash.

12.08.030 Public Property Tree Maintenance.

The City shall have the right to plant, prune, maintain and remove trees, plants and shrubs in all public rights-of-way and public grounds, as may be necessary to ensure public safety or to preserve and enhance the symmetry or other desirable characteristics of such public areas. The Natural Resources Committee may recommend to the Community Development Director the removal of any tree or part thereof which is in an unsafe condition, or which by reason of its nature is injurious to above or below-ground public utilities or other public improvements.

12.08.035 Public Tree Removal.

Existing street trees shall be retained and protected during construction unless removal is specified as part of a land use approval or in conjunction with a public facilities construction project, as approved by the community development director. A diseased or hazardous street tree, as determined by a registered arborist and verified by the City, may be removed if replaced. . A non-diseased, non-hazardous street tree that is removed shall be replaced in accordance with the Table 12.08.035.

All new street trees will have a minimum two-inch caliper trunk measured six inches above the root crown. The Community Development Director may approve off-site installation of replacement trees where necessary due to planting constraints. The Community Development Director may additionally allow a fee in-lieu of planting the tree(s) to be placed into a City fund dedicated to planting trees in Oregon City in accordance with OCMC 12.08.

Table 12.08.035

Replacement Schedule for Trees Determined to be Dead, Diseased or Hazardous by a Certified Arborist		*Replacement Schedule for Trees Not Determined to be Dead, Diseased or Hazardous by a Certified Arborist*	
Diameter of tree to be Removed (Inches of diameter at 4-ft height)	Number of Replacement Trees to be Planted	Diameter of tree to be Removed (Inches of diameter at 4-ft height)	Number of Replacement Trees to be Planted
Any Diameter	1 Tree	Less than 6"	1 Tree
		6" to 12"	2 Trees
		13" to 18"	3 Trees
		19" to 24"	4 Trees
		25" to 30"	5 Trees
		31" and over	8 Trees

12.08.040 Heritage Trees and Groves.

A. Purpose.

Certain trees, because of their age, species, natural resource value, ecological or historical association, are of special importance to the City. These trees may live on private or public property.

1. The purpose of this chapter is to recognize, foster appreciation and provide for voluntary protection of Heritage Trees.
2. In particular, the following trees are shall be considered significant, and therefore eligible for heritage tree nomination in Oregon City, if they meet the minimum size requirements of the table below:

Tree Eligibility based on Size

Species	Common Name	Size (d.b.h)
Quercus garrayana	Oregon white oak	8"
Pseudotsuga menziesii	Douglas-fir	18"
Thuja plicata	Western red cedar	12"
Pinus ponderosa	Ponderosa pine	12"
Taxus brevifolia	Western yew	6"

Other deciduous and horticultural tree species	20"
Other evergreen and conifer trees	18"

B. Recommendation.

1. Any citizen may recommend tree(s) to be designated as a Heritage Tree or Grove. If the proposed Heritage Tree or Grove is located on property other than City property or public right-of-way under City jurisdiction, the recommendation shall be submitted by the property owner or accompanied by the property owner's written consent. If the proposed Heritage Tree or Grove is located on City property or public right-of-way under City jurisdiction, the recommendation shall be submitted to the Community Development Director; if the recommendation is consented to by the City, the Community Development Director shall submit the recommendation to the City Commission.
2. Recommendation shall be made on such form as required by the Community Development Director. The recommendation form shall include a narrative explaining why the tree qualifies for Heritage Tree or Grove status pursuant to the definition in Section 1 and the written consent of the property owner as described in subsection (1) of this section.

C. Review Process.

1. The City Commission shall review all Heritage Trees and Grove recommendations at a public meeting. Notice of the meeting shall be provided to the recommending applicant, the property owner (unless the recommended tree or grove is located on public right-of-way under City jurisdiction, in which event notice shall be given to the Community Development Director), the chair of any recognized neighborhood association in which the tree or grove is located, and the Parks and Recreation Advisory Committee (PRAC), if applicable.
2. Staff shall prepare a report for the City Commission analyzing whether the tree or grove complies with the requirements for designation.
3. After considering the staff report and any testimony by interested persons, the City Commission shall vote on the recommendation.
4. Following approval by the City Commission:
   a. If the tree or grove is located on private property, the designation shall be complete upon the Property Owner's execution of a covenant running with the land suitable for recordation by the City. The covenant shall describe the subject property, generally describe the location of the heritage tree or grove, and covenant that the tree or grove is protected as a "Heritage Tree" or "Heritage Grove" by the City of Oregon City and is therefore subject to special protection as provided in this Title.
   b. If the tree or grove is located on public right-of-way, the designation shall be complete upon the Staff's listing of the tree or grove on the City Heritage Tree and Grove records.
   c. If the tree or grove is located on the public right-of-way, the City shall condition any future Property Owner-requested vacation of the public right-of-way upon the execution of a covenant in accordance with sub-section (a) above, which shall be recorded by the City upon the vacation of the right-of-way.

D. Criteria

1. The City Commission may designate a tree or grove as a Heritage Tree or Heritage Grove if the Commission determines that the following criteria are met:
   a. The tree or grove is of landmark importance to the City of Oregon City due to age, size, species, horticultural quality or historic importance; or
   b. It is listed as a State Heritage Tree, as designated by the state division of forest resources; or
   c. It is a rare species, or provides a habitat for rare species of plants, animals or birds; and

d. The tree is not irreparably damaged, diseased, hazardous or unsafe, or the applicant is willing to have the tree treated by an arborist and the treatment will alleviate the damage, disease or hazard;

E. Protection of Heritage Trees and Groves.

1. No Heritage Tree or Grove may be removed, topped, or otherwise altered unless permitted by this section.
2. An application to remove a Heritage Tree or Grove shall demonstrate that the burden imposed on the property owner, or, if the tree is located within the public right-of-way under City jurisdiction, then the burden imposed on the City by the continued presence of the tree outweighs the public benefit provided by the tree. For the purposes of making this determination, the following tree impacts shall not be considered unreasonable burdens on the property owner, or if appropriate, the City:
    a. View obstruction;
    b. Routine pruning, leaf raking and other maintenance activities; and
    c. Infrastructure impacts or tree hazards that can be controlled or avoided by appropriate pruning or maintenance.
3. Unless the tree is permitted to be removed due to poor health or hazard pursuant to Section 12.08.042, the applicant shall be required to mitigate for the loss of the tree pursuant to Table 12.08.042.
4. Any person who removes a Heritage Tree or Grove in violation of this chapter shall be subject to the penalties provided in this chapter.

F. Recognition of Heritage Trees and Groves.

1. A Heritage Tree plaque may be designed and furnished by the City to the property owner, or if the tree is in the public right-of-way, to the appropriate City official, of a designated Heritage Tree or Grove. The City may charge a fee to cover the costs of the providing the plaque. The plaque shall be posted at a location at or near the tree or grove and, if feasible, visible from a public right-of-way.
2. The Community Development Director shall maintain a list and map of designated Heritage Trees and Groves.

G. Removal of Heritage Tree or Grove Designation.

1. A Heritage Tree or Grove may be removed from designation if it dies or is removed pursuant to this chapter. If removed from private property, the City shall record a document extinguishing the covenant.

12.08.045 Gifts and Funding.

The City of Oregon City may accept gifts, which are specifically designated for the purpose of planting or maintaining trees within the city. The Community Development Director may allow a fee in-lieu of planting the tree(s) to be placed into a City fund dedicated to planting trees in Oregon City. The Community Development Director may determine the type, caliper and species of the trees purchased with the fund. The cost of each tree may be adjusted annually based upon current market prices for materials and labor as calculated by the Community Development Director. A separate fund shall be established and maintained for revenues and expenditures created by activities specified in this chapter. The Natural Resources Committee shall have authority on behalf of the city to seek grants and alternative funding for tree projects. Funds from such grant awards shall be administered by the city pursuant to this section.

12.08.050 Violation--Penalty.

The violation of any provision of this chapter shall be constitute a civil infraction, subject to code enforcement procedures of Chapter 1.16 and/or Chapter 1.20.
*Prior ordinance history: Ords. 98-1010 and 99-1004.

Oregon City Municipal Code
Chapter 15.25 Demolition by Neglect

15.25.010 Purpose.

Safeguard the City's historic, aesthetic and cultural heritage as embodied and reflected in its historic structures. It is declared as a matter of public policy that the retention of historic structures is a public necessity and is required in the interest of the health, prosperity, safety and welfare of the people.

15.25.015 Definitions.

The term "Demolition by Neglect" refers to the gradual deterioration of a building when routine or major maintenance is not performed. A Demolition by Neglect citation issued by the City is against the owner of the property for failure to properly maintain the property as per the specific criteria stated in the following paragraphs.
The types of deficiencies identified as "Demolition by Neglect" include any structural deficiency or a deficiency in a building part, which left unrepaired could lead to deterioration of the building's structural frame. A building is also identified as "Demolition by Neglect" if it is open to entry by vandals or vagrants.

15.25.020 Applicability.

All locally designated historic structures shall comply with this chapter in addition to the requirements of OCMC 15.24 Dangerous Buildings.

15.25.025 Criteria for Determination of Demolition by Neglect.

Specific criteria for the determination of Demolition by Neglect are as follows:

A. The deterioration of a building to the extent that it creates or permits a hazardous or unsafe condition as determined by the Building Official.
B. The deterioration of a building(s) characterized by one or more of the following:
    1. Those buildings, which have parts thereof which are so attached that they may fall and injure members of the public or property
    2. Deteriorated or inadequate foundation;
    3. Defective or deteriorated floor supports or floor supports insufficient to carry imposed loads with safety;
    4. Members of walls, or other vertical supports that split, lean, list, or buckle due to defective material or deterioration;
    5. Members of walls or other vertical supports that are insufficient to carry imposed loads with safety;
    6. Members of ceiling, roofs, ceiling and roof supports, or other horizontal members which sag, split, or buckle due to defective material or deterioration;
    7. Members of ceiling, roofs, ceiling and roof supports, or other horizontal members that are insufficient to carry imposed loads with safety;
    8. Fireplaces or chimneys which list, bulge, or settle due to defective material or deterioration;
    9. Any fault, defect, or condition in the building, which renders the same structurally unsafe or not properly watertight.

C. The deterioration of a building(s) as specified by the International Property Maintenance Code.
D. Action by the City, the Fire Marshall, or the Building Official relative to the safety or physical condition of any building.

15.25.030 Stabilization Process.

A. Identification by Community Development Director and the Building Official that a building's condition falls under the City's criteria of Demolition by Neglect. This initial identification may be made by a staff inspection of the building or by a citizen through the code enforcement process.
B. The staff presents the building's condition to the Historic Review Board at a noticed public meeting with a report detailing the defects that, in the staff's opinion, qualifies the structure for Demolition by Neglect. To proceed with the citation process the Historic Review Board must vote by a majority to make a preliminary finding of Demolition by Neglect.
C. If the Historic Review Board makes a preliminary determination, the owner shall be notified by certified mail of the defects in the building. The owner shall be given thirty (30) days in which to respond to the preliminary determination by obtaining a Certificate of Appropriateness from the Community Development Director for the corrective work. If a Certificate of Appropriateness is issued at this point, it will detail the specific work that is necessary to correct the Demolition by Neglect conditions, and a time limit for work to begin and be completed shall be set.
D. If the owner of the property receives the letter regarding the preliminary determination, but either fails to respond or wishes to present his/her case in front of the Historic Review Board, the matter shall be referred to the Historic Review Board for a citation hearing. If the owner fails to receive the letter regarding the preliminary determination after two attempts, the building shall be posted with a notice of the violation in accordance with the provisions of the Ordinance, and a public hearing on the citation shall be scheduled.
E. At the public hearing the Historic Review Board may issue a citation to the owner of the property for failure to correct the Demolition by Neglect conditions. The citation shall be made by a vote of the majority of the Historic Review Board on a motion recognizing the condition of the building and the owner's failure to correct the defects. The owner shall be invited to the public hearing to address the Historic Review Board's concerns and to show cause why a citation should not be issued. The Historic Review Board may also defer the matter to give the owner more time either to correct the deficiencies, make a proposal for repairs, or perhaps sell the property.
F. If the owner is cited for the condition of Demolition by Neglect of the property, the owner shall be given ten (10) days grace period to respond with a proposal to correct the defects.

If the owner fails to respond after the ten-day grace period following the citation, or has proposed a plan that does not fully address the stabilization defects, or does not receive a Certificate of Appropriateness for the proposed work, the building shall be turned over to the Code Enforcement Division for action in Municipal Court per *OCMC 1.25.* In absence of a stabilization plan, the city may hire an inspector or structural/building specialist to estimate the cost to bring the building out of Demolition by Neglect status. The city may charge the cost of the analysis to the owner to be included in any future liens.

15.25.035- Emergency Stabilization.

In the event of a fire, earthquake, flood or other incident that has an immediate effect on the stabilization of the historic structure, the building official may require the application

of emergency stabilization measures that will ensure the stability of the building while it is being reviewed through the stabilization process in section OCMC 15.25.050. Stabilization measures may include, but are not limited to the following: boarding of windows, tarping of roofs, or the addition of temporary exterior or interior bracing. If the stabilization measures are not completed within 48 hours of notice to the property owner by the Building Official or Code Enforcement Officer, the City Manager shall cause the building to be stabilized per the requirements of the Historic Review Board and with means that meet the Secretary of Interior's Standards for Rehabilitation.

15.25.040 Process to Lien Property.

The cost of the stabilization, plus twenty-five percent thereof for administrative overhead shall constitute the cost of the stabilization. The city recorder shall forward to the owner a notice setting forth the expense incurred, stating that such expense will be assessed against the real property involved and that any objections must be filed in writing with the city recorder within twenty days of the date of mailing. If such objections be filed, the commission shall set a date for hearing and determine the amount of assessment. The expense so incurred or determined upon hearing shall then be assessed by ordinance, entered in the City lien docket, and shall be collected and foreclosed as in the manner for collection of City liens for street and sewer improvements. All such liens shall bear interest at the legal rate from the date of entry in the lien docket.

15.25.045 Violation--Penalty.

Violation of any provision of this chapter shall constitute a civil infraction, subject to the code enforcement procedures of Chapter 1.20 of this code.

Oregon City Municipal Code

Chapter 15.40 FIRE CODE

15.40.010 Adoption.

The 2007 Edition of the Oregon Fire Code as adopted by the state of Oregon pursuant to OAR 837-040-0001 to -0010, is adopted in its entirety, and all provisions, rules, regulations, penalties and statements therein are made the provisions, rules, regulations, penalties and statements of the city.

Oregon City Municipal Code
16.04 General Provisions and Administration of Land Divisions

16.04.010 Purpose.

This title is enacted in compliance with ORS 92.010 through 92.160 to establish procedures and standards for partitioning and subdividing land within the city. These regulations, along with requirements of the city's underlying zoning, provide the dimensional requirements for building lots, street locations, street design, rights-of-way, location requirements for houses on residential lots, the provision of adequate open space for recreation and community facilities, and the basic requirements for the installation of public utilities, all with the aim of achieving:

A. A sufficient supply of needed housing with satisfactory living conditions in new subdivisions that comply with Statewide Planning Goal 10 and implementing administrative rules, guidelines and statutes;
B. The protection, conservation and proper use of the land;
C. The timely and efficient extension of public facilities and services without excessive expenditure of public funds in accordance with Statewide Planning Goals 11 and 14 and their implementing administrative rules and guidelines;
D. The simplification and greater accuracy of land descriptions;
E. The protection of property owners from excessive assessment for future utility installations and to provide a means of ensuring that property owners pay only their fair share of the cost of providing public facilities and services;
F. The protection of the health, safety and general welfare of the public;
G. Increased consumer protection by assuring that only those lots which have met city requirements and have been lawfully created through subdivision or partition approval are allowed to be advertised for sale;
H. Increased urban density and a livable design that achieves Metro-mandated requirements, while providing an enjoyable living and working environment; and
I. Safe, direct and convenient pedestrian and bicycle access, where reasonably possible within, from and between residential, commercial, industrial and institutional developments and neighborhood activity centers in accordance with Statewide Planning Goal 12 and the implementing administrative rule.

16.04.015 Fees.

A. Filing Fees. The City Commission shall establish by resolution a schedule of fees for all land division and engineering plan reviews, inspections, applications and appeals provided for under this title. Fees shall be structured to reflect the city's actual cost of providing the required services and must be paid in full at the time of application, along with all other required information and documents before the application to be deemed complete. Filing fees shall not be refundable or reimbursable except as provided in Section 17.50.290 of this code.
B. Technical Plan Check and Inspection Fees. The City Commission shall establish by resolution a plan check and inspection fee. This fee shall be paid to cover the City's costs of reviewing plans and inspecting public improvements.
C. Other Fees. The fees required by this chapter are in addition to any fees charged by any other department of the city and any other governmental entity with regulatory jurisdiction.

16.04.020 Conditions of land division approval.

The decision-maker may impose reasonable conditions of approval on any approval granted under this title to ensure that the application meets, or will meet, any application approval standard.

16.04.025 Restrictions on sale of lots until process is complete.

A. No person shall negotiate to sell any lot in a subdivision until a preliminary plat has been approved pursuant to this title.
B. No person shall complete the sale of any lot in any subdivision until the final subdivision plat for the development has been approved under this title and properly recorded with the county.
C. Parcels subject to the partition process under this title may be advertised, and sales negotiated, prior to preliminary partition plat approval; however, no sale of any such lot may be completed until the city has granted final partition approval under this title and the plat is properly recorded with the county.

16.04.030 Severability.

If any part of this title is for any reason held invalid or unconstitutional by a court of competent jurisdiction, that part shall be deemed separate from the balance of the title and the invalidation of any part of this title shall not affect the validity or enforceability of any of the title's remaining portions.

16.04.035 Nuisance--Violations and penalties.

Any act, omission or use of property in violation of the requirements of this chapter shall constitute a nuisance, a civil infraction and a code violation subject to the code enforcement provisions of Chapters 1.16, 1.20 and 1.24.

Oregon City Municipal Code
Chapter 16.08 Subdivisions – Process and Standards

16.08.010 Purpose and General Provisions.

A. Applicability. This chapter controls the process and approval standards applicable to subdivisions including Chapters 16.08, 12.04, 16.12, and 17.50 of the Oregon City Municipal Code as well as any other applicable chapters. A subdivision is defined as a single division of land into four or more lots within a calendar year.
B. These applications shall generally follow a Type II process. However, if an applicant opts to process either application as an expedited land division, the city shall follow the decision-making process provided by state law and apply the applicable approval standards set forth in this code and elsewhere.
C. Purpose. The purpose of this chapter is to provide a speedy review and decision-making process with relatively clear and objective criteria indicating little discretion, with little opportunity to deviate from the City's dimensional standards. If an applicant wishes greater flexibility in lotting pattern or layout, phasing of development, or relief from dimensional or public improvement standards, the appropriate procedure would be a master plan under Chapter 17.65 or an additional application for a variance(s) under Chapter 17.60.
D. Process Overview. Subdivision review process requires a two-step process: preliminary and final plats. The preliminary plat, reviewed through a Type II process, provides all of the essential information about the proposal, including layout, number and pattern of lots, location of all existing structures and improvements, significant natural features, development schedule and any other required information. The final plat is a formal reproduction of the approved preliminary plat, including all conditions imposed by the decision-maker, submitted in recordable form. So long as the final plat does not deviate from the product approved in the preliminary plat, the City's review of the final plat shall be conducted through a Type I process. If the final plat deviates significantly from the approved preliminary plat, the final plat review shall be processed in the same manner as was the preliminary plat.

16.08.015 Preapplication Conference Required.

Before the City will accept a subdivision application, the applicant must schedule and attend a preapplication conference in accordance with Section 17.50.050. At a minimum, an applicant should bring to the preapplication conference a tax map of the subject tax lot(s) and surrounding tax lots, scale drawings of the proposed subdivision lotting pattern, streets, utilities and important site features and improvements, and a topographic map of the property.

16.08.020 Preliminary Subdivision Plat Application.

Within six (6) months of the preapplication conference, an applicant may apply for preliminary subdivision plat approval. The applicant's submittal must provide a complete description of existing conditions, the proposed subdivision and an explanation of how the application meets all applicable approval standards. The following sections describe the specific submittal requirements for a preliminary subdivision plat, which include plan drawings, a narrative statement and certain tabular information. Once the application is deemed to be complete, the Community Development Director shall provide notice of the application and an invitation to comment for a minimum of fourteen days to surrounding property owners in accordance with 17.50.090(A). At the conclusion of the comment period, the Community Development Director will evaluate the application, taking into consideration all relevant, timely filed comments, and render a written decision in accordance with Section 17.50. The Community Development Director's decision may be appealed to the City Commission with notification to the Planning Commission.

16.08.025 Preliminary Subdivision Plat--Required Plans.

The preliminary subdivision plat shall specifically and clearly show the following features and information on the maps, drawings, application form or attachments. All maps and site drawings shall be at a minimum scale of one inch to fifty feet.

A. Site Plan. A detailed site development plan showing the location and dimensions of lots, streets, pedestrian ways, transit stops, common areas, building envelopes and setbacks, all existing and proposed utilities and improvements including sanitary sewer, stormwater and water facilities, total impervious surface created (including streets, sidewalks, etc.) and an indication of existing and proposed land uses for the site. If required by staff at the pre-application conference, a subdivision connectivity analysis shall be prepared by a transportation engineer licensed by the State of Oregon that describes the existing and future vehicular, bicycle and pedestrian connections between the proposed subdivision and existing or planned land uses on adjacent properties. The subdivision connectivity analysis shall include shadow plats of adjacent properties demonstrating how lot and street patterns within the proposed subdivision will extend to and/or from such adjacent properties and can be developed meeting the existing Oregon City Municipal Code design standards.

B. Traffic/Transportation Plan. The applicant's traffic/transportation information shall include two elements: (1) A detailed site circulation plan showing proposed vehicular, bicycle, transit and pedestrian access points and connections to the existing system, circulation patterns and connectivity to existing rights-of-way or adjacent tracts, parking and loading areas and any other transportation facilities in relation to the features illustrated on the site plan; and (2) a traffic impact study prepared by a qualified professional transportation engineer, licensed in the state of Oregon, that assesses the traffic impacts of the proposed development on the existing transportation system and analyzes the adequacy of the proposed internal transportation network to handle the anticipated traffic and the adequacy of the existing system to accommodate the traffic from the proposed development. The City Engineer may waive any of the foregoing requirements if determined that the requirement is unnecessary in the particular case.

C. Natural Features Plan and Topography, Preliminary Grading and Drainage Plan. The applicant shall submit a map illustrating all of the natural features and hazards on the subject property and, where practicable, within two hundred fifty feet of the property's boundary. The map shall also illustrate the approximate grade of the site before and after development. Illustrated features must include all proposed streets and cul-de-sacs, the location and estimated volume of all cuts and fills, and all stormwater management features. This plan shall identify the location of drainage patterns and courses on the site and within two hundred fifty feet of the property boundaries where practicable. Features that must be illustrated shall include the following:
    1. Proposed and existing street rights-of-way and all other transportation facilities;
    2. All proposed lots and tracts;
    3. All trees proposed to be removed prior to final plat with a diameter six inches or greater diameter at breast height (d.b.h);
    4. All natural resource areas pursuant to Chapter 17.49, including all jurisdictional wetlands shown in a delineation according to the Corps of Engineers Wetlands Delineation Manual, January, 1987 edition, and approved by the Division of State Lands and wetlands identified in the City of Oregon Local Wetlands inventory, adopted by reference in the City of Oregon City comprehensive plan;
    5. All known geologic and flood hazards, landslides or faults, areas with a water table within one foot of the surface and all flood management areas pursuant to Chapter 17.42;
    6. The location of any known state or federal threatened or endangered species;
    7. All historic areas or cultural features acknowledged as such on any federal, state or city inventory;
    8. All wildlife habitat or other natural features listed on any of the City's official inventories.

The Community Development Director may waive any of the foregoing requirements if the Community Development Director determines that the requirement is unnecessary in the particular case and that the intent of this chapter has been met.

16.08.030 Preliminary Subdivision Plat--Narrative Statement.

In addition to the plans required in the previous section, the applicant shall also prepare and submit a narrative statement that addresses the following issues:

A. Subdivision Description. A detailed description of the proposed development, including a description of proposed uses, number and type of residential units, allocation and ownership of all lots, tracts, streets, and public improvements, the structure of any homeowner's association, and each instance where the proposed subdivision will vary from some dimensional or other requirement of the underlying zoning district. For each such variance, a separate application will be required pursuant to Chapter 17.60, Variances;

B. Timely Provision of Public Services and Facilities. The applicant shall explain in detail how and When each of the following public services or facilities is, or will be, adequate to serve the proposed development by the time construction begins:
   1. Water,
   2. Sanitary sewer,
   3. Storm sewer and stormwater drainage,
   4. Parks and recreation,
   5. Traffic and transportation,
   6. Schools,
   7. Fire and police services;

   Where adequate capacity for any of these public facilities and services is not demonstrated to be currently available, the applicant shall describe how adequate capacity in these services and facilities will be financed and constructed before recording of the plat;

C. Approval Criteria and Justification for Variances. The applicant shall explain how the proposed subdivision is consistent with the standards set forth in Chapter 16.12, 12.04 and any other applicable approval standards identified in the municipal code. For each instance where the applicant proposes a variance from some applicable dimensional or other numeric requirement, the applicant shall address the approval criteria from Chapter 17.60 .

D. Drafts of the proposed covenants, conditions and restrictions (CC&Rs), maintenance agreements, homeowner association agreements, dedications, deeds easements, or reservations of public open spaces not dedicated to the city, and related documents for the subdivision;

E. A description of any proposed phasing, including for each phase the time, acreage, number of residential units, amount of area for nonresidential use, open space, development of utilities and public facilities;

F. Overall density of the subdivision and the density by dwelling type for each.

16.08.035 Notice and Invitation to Comment.

Upon the City's determination that an application for a preliminary subdivision plat is complete, pursuant to Section 17.50, the city shall provide notice of the application in accordance with requirements of Section 17.50 applicable to Type II decisions.

16.08.040 Preliminary Subdivision Plat--Approval Standards and Decision.

The minimum approval standards that must be met by all preliminary subdivision plats are set forth in Chapter 16.12, and in the dimensional and use requirements set forth in the chapter of this code that corresponds to the underlying zone. The Community Development Director shall evaluate the application to determine that the proposal does, or can through the imposition of conditions of approval, meet these approval standards. The Community Development Director's decision shall be issued in accordance with the requirements of Section 17.50.

16.08.045 Building Site--Frontage Width Requirement.

Each lot in a subdivision shall abut upon a cul-de-sac or street other than an alley for a width of at least twenty feet.

16.08.050 Flag Lots in Subdivisions

Flag lots shall not be permitted within subdivisions except as approved by the Community Development Director and in compliance with the following standards.

A. Where the applicant can show that the existing parcel configuration, topographic constraints or where an existing dwelling unit is located so that it precludes a land division that meets the minimum density, lot width and/or depth standards of the underlying zone.
B. If a flag lot is created, a joint accessway shall be provided unless the location of the existing dwelling unit prevents a joint accessway. A perpetual reciprocal access easement and maintenance agreement shall be recorded for the joint accessway, in a format acceptable by the city attorney.
C. The pole portion of the flag lot shall connect to a public street.
D. The pole shall be at least 8 feet wide for the entire length.
E. The pole shall be part of the flag lot and must be under the same ownership as the flag portion of the lot.

16.08.055 Final Subdivision Plat--Application Requirements and Approval Standards.

The applicant shall apply for final subdivision plat approval within twenty-four months following approval of a preliminary subdivision plat. The applicant shall apply for final plat approval to the City and shall pay the applicable fees as set forth on the City's adopted fee schedule. The final subdivision plat is processed as an administrative decision by the City so long as the final subdivision plat is consistent with the approved preliminary subdivision plat as conditioned by the decision-maker.

A. If the Community Development Director determines that the final subdivision plat submitted by the applicant is not consistent with the approved preliminary subdivision plat, the modified subdivision shall be subject to the same Type II process and review standards as were applicable to the preliminary subdivision plat. However, if such a review is necessary, the review shall be limited only to those aspects of the final subdivision plat that deviate from the approved preliminary subdivision plat. The decision-maker's original approval of all other aspects of the subdivision may be relied upon as a conclusive determination of compliance with the applicable standards.
B. The Community Development Director shall approve a final subdivision plat that is consistent with the approved preliminary subdivision plat, including any conditions attached thereto and required permits for access to facilities owned by another jurisdiction.

16.08.060 Filing and Recording of Final Subdivision Plat.

Following approval of the final subdivision plat, the applicant shall file with the county recording officer the confirmed and approved copy of the final subdivision plat together with all pertinent documents approved as to form by the city attorney.

16.08.065 Post-Approval Modifications to Approved Plat.

All modifications to a subdivision that has received final plat approval shall be applied for and processed in the same manner as was the original preliminary subdivision plat and subject to the same approval standards. However, the city is entitled to rely upon the prior decision and findings for those portions of the subdivision that the applicant does not propose to modify.

Oregon City Municipal Code
Chapter 16.12 Minimum Improvements and Design Standards for Land Divisions

16.12.010 Purpose and General Provisions.

All land divisions shall be in conformance with the policies and design standards established by this chapter and with applicable standards in the City 's public facility master plan and city design standards and specifications. In reviewing applications for land division, the City Engineer shall take into consideration any approved land divisions and the remaining development potential of adjacent properties. All street, water, sanitary sewer, storm drainage and utility plans associated with any land division must be reviewed and approved by the city engineer prior to construction. All streets, driveways or storm drainage connections to another jurisdiction's facility or right-of-way must be reviewed by the appropriate jurisdiction as a condition of the preliminary plat and when required by law or intergovernmental agreement shall be approved by the appropriate jurisdiction.

16.12.015 Street Design--Generally.

Street design standards for all new development and land divisions shall comply with Chapter 12.04 Street Design Standards.

16.12.020 Blocks--Generally.

The length, width and shape of blocks shall take into account the need for adequate building site size, convenient motor vehicle, pedestrian, bicycle and transit access, control of traffic circulation, and limitations imposed by topography and other natural features.

16.12.025 Blocks--Length.

Block lengths for local streets and collectors shall not exceed five hundred feet between through streets, as measured between nearside right-of-way lines.

16.12.030 Blocks--Width.

The width of blocks shall ordinarily be sufficient to allow for two tiers of lots with depths consistent with the type of land use proposed.

16.12.035 Blocks--Pedestrian and Bicycle Access.

A. To facilitate the most practicable and direct pedestrian and bicycle connections to adjoining or nearby neighborhood activity centers, public rights-of-way, and pedestrian/bicycle accessways which minimize out-of-direction travel, subdivisions shall include pedestrian/bicycle access-ways between discontinuous street right-of-way where the following applies:
   1. Where a new street is not practicable;
   2. Through excessively long blocks at intervals not exceeding five hundred feet of frontage as measured between nearside right-of-way lines; or
   3. Where the lack of street continuity creates inconvenient or out of direction travel patterns for local pedestrian or bicycle trips.

B. Pedestrian/bicycle accessways shall be provided:
   1. To provide direct access to nearby neighborhood activity centers, transit streets and other transit facilities;

2. Where practicable, to provide direct access to other adjacent developments and to adjacent undeveloped property likely to be subdivided or otherwise developed in the future;
3. To provide direct connections from cul-de-sacs and internal private drives to the nearest available street or neighborhood activity center;
4. To provide connections from cul-de-sacs or local streets to arterial or collector streets.

C. An exception may be made where the Community Development Director determines that construction of a separate accessway is not feasible due to physical or jurisdictional constraints. Such evidence may include but is not limited to:
1. That other federal, state or local requirements prevent construction of an accessway;
2. That the nature of abutting existing development makes construction of an accessway impracticable;
3. That the accessway would cross an area affected by an overlay district in a manner incompatible with the purposes of the overlay district;
4. That the accessway would cross topography consisting predominantly of slopes over twenty-five percent;
5. That the accessway would terminate at the urban growth boundary and extension to another public right-of-way is not part of an adopted plan.

D. Pedestrian/bicycle accessways shall comply with the development standards set out in Section 12.24 of this code, with the ownership, liability and maintenance standards in Section 12.24 of this code, and with such other design standards as the city may adopt.

16.12.040 Building Sites.

The size, width, shape and orientation of building sites shall be appropriate for the primary use of the land division, and shall be consistent with the residential lot size provisions of the zoning ordinance with the following exceptions:

A. Where property is zoned and planned for commercial or industrial use, the Community Development Director may approve other widths in order to carry out the City's Comprehensive Plan. Depth and width of properties reserved or laid out for commercial and industrial purposes shall be adequate to provide for the off-street service and parking facilities required by the type of use and development contemplated.

B. Minimum lot sizes contained in Title 17 are not affected by those provided herein.

16.12.045 Building Sites – Minimum Density

All subdivision layouts shall achieve at least 80% of the maximum density of the base zone for the net developable area as defined in Section 17.04.

16.12.050 Calculations of Lot Area.

A subdivision in the R-10, R-8, R-6, R-5, or R-3.5 Dwelling District may include lots that are up to 20% less than the required minimum lot area of the applicable zoning designation provided the entire subdivision on average meets the minimum site area requirement of the underlying zone. The average lot area is determined by calculating the total site area devoted to dwelling units and dividing that figure by the proposed number of dwelling lots.

Accessory dwelling units are not included in this determination nor are tracts created for non-dwelling unit purposes such as open space, storm water tracts, or access ways.

A lot that was created pursuant to this section may not be further divided unless the average lot size requirements are still met for the entire subdivision.

When a lot abuts a public alley, an area equal to the length of the alley frontage along the lot times the width of the alley right-of-way measured from the alley centerline may be added to the area of the abutting lot in order to satisfy the lot area requirement for the abutting lot. It may also be used in calculating the average lot area.

16.12.055 Building Site--Through Lots.

Through lots and parcels shall be avoided except where they are essential to provide separation of residential development from major arterials or to overcome specific disadvantages of topography of existing development patterns. A reserve strip may be required. A planting screen restrictive covenant may be required to separate residential development from major arterial streets, adjacent nonresidential development, or other incompatible use, where practicable. Where practicable, alleys or shared driveways shall be used for access for lots that have frontage on a collector or minor arterial street, eliminating through lots.

16.12.060 Building Site--Lot and Parcel Side Lines.

The lines of lots and parcels, as far as is practicable, shall run at right angles to the street upon which they face, except that on curved streets they shall be radial to the curve.

16.12.065 Building Site--Grading.

Grading of building sites shall conform to the state of Oregon Structural Specialty Code, Chapter 18, , any approved grading plan and any approved residential lot grading plan in accordance with the requirements of Chapter 15.48, 16.12 and the Public Works Stormwater and Grading Design Standards, and the erosion control requirements of Chapter 17.47.

16.12.070 Building Site--Setbacks and Building Location.

This standard ensures that lots are configured in a way that development can be orientated toward streets to provide a safe, convenient and aesthetically pleasing environment for pedestrians and bicyclists. The objective is for lots located on a neighborhood collector, collector or minor arterial street locate the front yard setback on and design the most architecturally significant elevation of the primary structure to face the neighborhood collector, collector or minor arterial street.

A. The front setback of all lots located on a neighborhood collector, collector or minor arterial shall be orientated toward the neighborhood collector, collector or minor arterial street .
B. The most architecturally significant elevation of the house shall face the the neighborhood collector, collector or minor arterial street.
C. On corner lots located on the corner of two local streets, the main facade of the dwelling may be oriented towards either street.
D. All lots proposed with a driveway and lot orientation on a collector or minor arterial shall combine driveways into one joint access per two or more lots unless the City Engineer determines that:
    1. No driveway access may be allowed since the driveway(s) would cause a significant traffic safety hazard; or
    2. Allowing a single driveway access per lot will not cause a significant traffic safety hazard.
E. The Community Development Director may approve an alternative design, consistent with the intent of this section, where the applicant can show that existing development patterns preclude the ability to practically meet this standard.

16.12.075 Building Site--Division of Lots.

Where a tract of land is to be divided into lots or parcels capable of redivision in accordance with this chapter, the Community Development Director shall require an arrangement of lots, parcels and streets

which facilitates future redivision. In such a case, building setback lines may be required in order to preserve future right-of-way or building sites.

16.12.080 Protection of Trees.

Protection of trees shall comply with the provisions of Chapter 17.41 – Tree Protection.

16.12.085 Easements.

The following shall govern the location, improvement and layout of easements:

A. Utilities. Utility easements shall be required where necessary as determined by the city engineer. Insofar as practicable, easements shall be continuous and aligned from block-to-block within the land division and with adjoining subdivisions or partitions. Specific utility easements for water, sanitary or storm drainage shall be provided based on approved final engineering plans.

B. Unusual Facilities. Easements for unusual facilities such as high voltage electric transmission lines, drainage channels and stormwater detention facilities shall be adequately sized for their intended purpose, including any necessary maintenance roads. These easements shall be shown to scale on the preliminary and final plats or maps. If the easement is for drainage channels, stormwater detention facilities or related purposes, the easement shall comply with the requirements of the Public Works Stormwater and Grading Design Standards.

C. Watercourses. Where a land division is traversed or bounded by a watercourse, drainageway, channel or stream, a stormwater easement or drainage right-of-way shall be provided which conforms substantially to the line of such watercourse, drainageway, channel or stream and is of a sufficient width to allow construction, maintenance and control for the purpose as required by the responsible agency. For those subdivisions or partitions which are bounded by a stream of established recreational value, setbacks or easements may be required to prevent impacts to the water resource or to accommodate pedestrian or bicycle paths.

D. Access. When easements are used to provide vehicular access to lots within a land division, the construction standards, but not necessarily width standards, for the easement shall meet city specifications. The minimum width of the easement shall be twenty feet. The easements shall be improved and recorded by the applicant and inspected by the city engineer. Access easements may also provide for utility placement.

E. Resource Protection. Easements or other protective measures may also be required as the Community Development Director deems necessary to ensure compliance with applicable review criteria protecting any unusual significant natural feature or features of historic significance.

16.12.090 Minimum Improvements--Procedures.

In addition to other requirements, improvements installed by the applicant either as a requirement of these or other regulations, or at the applicant's option, shall conform to the requirements of this title and be designed to city specifications and standards as set out in the City's facility master plan and Public Works Stormwater and Grading Design Standards. The improvements shall be installed in accordance with the following procedure:

A. Improvement work shall not commence until construction plans have been reviewed and approved by the city engineer and to the extent that improvements are in county or state right-of-way, they shall be approved by the responsible authority. To the extent necessary for evaluation of the proposal, the plans may be required before approval of the preliminary plat of a subdivision or partition. Expenses incurred thereby shall be borne by the applicant and paid for prior to final plan review.

B. Improvements shall be constructed under the inspection and approval of the city engineer. Expenses incurred thereby shall be borne by the applicant and paid prior to final approval. Where required by the city engineer or other city decision-maker, the applicant's project engineer also shall inspect construction.

C. Erosion control or resource protection facilities or measures are required to be installed in accordance with the requirements of Chapter 17.49 and the Public Works Erosion and Sediment Control Standards. Underground utilities, waterlines, sanitary sewers and storm drains installed in streets shall be constructed prior to the surfacing of the streets. Stubs for service connections for underground utilities and sanitary sewers shall be placed beyond the public utility easement behind to the lot lines.
D. As-built construction plans and digital copies of as-built drawings shall be filed with the city engineer upon completion of the improvements.
E. The City Engineer may regulate the hours of construction and access routes for construction equipment to minimize impacts on adjoining residences or neighborhoods.

16.12.095 Minimum Improvements--Public Facilities and Services.

The following minimum improvements shall be required of all applicants for a land division under Title 16, unless the decision-maker determines that any such improvement is not proportional to the impact imposed on the City's public systems and facilities:

A. Transportation System. Applicants and all subsequent lot owners shall be responsible for improving the city's planned level of service on all public streets, including alleys within the land division and those portions of public streets adjacent to but only partially within the land division. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for street improvements that benefit the applicant's property. Applicants are responsible for designing and providing adequate vehicular, bicycle and pedestrian access to their developments and for accommodating future access to neighboring undeveloped properties that are suitably zoned for future development. Storm drainage facilities shall be installed and connected to off-site natural or man-made drainageways. Upon completion of the street improvement survey, the applicant shall reestablish and protect monuments of the type required by ORS 92.060 in monument boxes with covers at every public street intersection and all points or curvature and points of tangency of their center line, and at such other points as directed by the city engineer.
B. Stormwater Drainage System. Applicants shall design and install drainage facilities within land divisions and shall connect the development's drainage system to the appropriate downstream storm drainage system as a minimum requirement for providing services to the applicant's development. The applicant shall obtain county or state approval when appropriate. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for stormwater drainage improvements that benefit the applicant's property. Applicants are responsible for extending the appropriate storm drainage system to the development site and for providing for the connection of upgradient properties to that system. The applicant shall design the drainage facilities in accordance with city drainage master plan requirements, Chapter 13.12 and the Public Works Stormwater and Grading Design Standards.
C. Sanitary Sewer System. The applicant shall design and install a sanitary sewer system to serve all lots or parcels within a land division in accordance with the city's sanitary sewer design standards, and shall connect those lots or parcels to the city's sanitary sewer system, except where connection is required to the county sanitary sewer system as approved by the county. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for sanitary sewer improvements that benefit the applicant's property. Applicants are responsible for extending the city's sanitary sewer system to the development site and through the applicant's property to allow for the future connection of neighboring undeveloped properties that are suitably zoned for future development. The applicant shall obtain all required permits and approvals from all affected jurisdictions prior to final approval and prior to commencement of construction. Design shall be approved by the city engineer before construction begins.
D. Water System. The applicant shall design and install a water system to serve all lots or parcels within a land division in accordance with the city public works water system design standards, and shall connect those lots or parcels to the city's water system. All applicants shall execute a binding agreement to not

remonstrate against the formation of a local improvement district for water improvements that benefit the applicant's property. Applicants are responsible for extending the city's water system to the development site and through the applicant's property to allow for the future connection of neighboring undeveloped properties that are suitably zoned for future development.

E. Sidewalks. The applicant shall provide for sidewalks on both sides of all public streets, on any private street if so required by the decision-maker, and in any special pedestrian way within the land division. Exceptions to this requirement may be allowed in order to accommodate topography, trees or some similar site constraint. In the case of major or minor arterials, the decision-maker may approve a land division without sidewalks where sidewalks are found to be dangerous or otherwise impractical to construct or are not reasonably related to the applicant's development. The decision-maker may require the applicant to provide sidewalks concurrent with the issuance of the initial building permit within the area that is the subject of the land division application. Applicants for partitions may be allowed to meet this requirement by executing a binding agreement to not remonstrate against the formation of a local improvement district for sidewalk improvements that benefit the applicant's property.

F. Bicycle Routes. If appropriate to the extension of a system of bicycle routes, existing or planned, the decision-maker may require the installation of separate bicycle lanes within streets and separate bicycle paths.

G. Street Name Signs and Traffic Control Devices. The applicant shall pay the city and the city installs street name signs at all street intersections. The applicant shall install traffic control devices as directed by the city engineer. Street name signs and traffic control de-vices shall be in conformance with all applicable city regulations and standards.

H. Street Lights. The applicant shall install street lights which shall be served from an underground source of supply. Street lights shall be in conformance with all city regulations.

I. Street Trees. Refer to Chapter 12.08, Street Trees.

J. Bench Marks. At least one bench mark shall be located within the subdivision boundaries using datum plane specified by the city engineer.

K. Other. The applicant shall make all necessary arrangements with utility companies or other affected parties for the installation of underground lines and facilities. Electrical lines and other wires, including but not limited to communication, street lighting and cable television, shall be placed underground.

L. Oversizing of Facilities. All facilities and improvements shall be designed to city standards as set out in the city's facility master plan, public works design standards, or other city ordinances or regulations. Compliance with facility design standards shall be addressed during final engineering. The city may require oversizing of facilities to meet standards in the city's facility master plan or to allow for orderly and efficient development. Where oversizing is required, the applicant may request reimbursement from the city for oversizing based on the city's reimbursement policy and funds available, or provide for recovery of costs from intervening properties as they develop.

M. Erosion Control Plan--Mitigation. The applicant shall be responsible for complying with all applicable provisions of Chapter 17.47 with regard to erosion control.

16.12.100 Minimum Improvements--Road Standards and Requirements.

A. The creation of a public street and the resultant separate land parcels shall be in conformance with requirements for subdivisions or partitions and the applicable street design standards of Chapter 12.04. However, the decision-maker may approve the creation of a public street to be established by deed without full compliance with the regulations applicable to subdivisions or partitions where any of the following conditions exist:

1. The establishment of the public street is initiated by the city commission and is declared essential for the purpose of general traffic circulation and the partitioning of land is an incidental effect rather than the primary objective of the street;

2. The tract in which the street is to be dedicated is within an isolated ownership either not over one acre or of such size and characteristics as to make it impossible to develop building sites for more than three dwelling units.

B. For any public street created pursuant to subsection A of this section, a copy of a preliminary plan and the proposed deed shall be submitted to the Community Development Director and city engineer at least ten days prior to any public hearing scheduled for the matter. The plan, deed and any additional information the applicant may submit shall be reviewed by the decision-maker and, if not in conflict with the standards of Title 16 and Title 17, may be approved with appropriate conditions.

16.12.105 Minimum Improvements--Timing Requirements.

A. Prior to applying for final plat approval, the applicant shall either complete construction of all public improvements required as part of the preliminary plat approval or guarantee the construction of those improvements. Whichever option the applicant elects shall be in accordance with this section.

B. Construction. The applicant shall construct the public improvements according to approved final engineering plans and all applicable requirements of this code, and under the supervision of the city engineer. Under this option, the improvement must be complete and accepted by the city engineer prior to final plat approval.

C. Financial Guarantee. The applicant shall provide the city with a financial guarantee in a form acceptable to the city attorney and equal to one hundred ten percent of the cost of constructing the public improvements in accordance with OCMC Chapter 17.50. Possible forms of guarantee include an irrevocable or standby letter of credit, guaranteed construction loan set-aside, reserve account, or performance guarantee, but the form of guarantee shall be specified by the city engineer and, prior to execution and acceptance by the city, must be reviewed and approved by the city attorney. The amount of the guarantee shall be based upon approved final engineering plans, equal to at least one hundred ten percent of the estimated cost of construction, and shall be supported by a verified engineering estimate and approved by the city engineer.

16.12.110 Minimum Improvements -- <u>Financial Guarantee.</u>

When conditions of permit approval require a permitee to construct certain improvements, the city may, in its discretion, allow the permitee to submit a performance guarantee in lieu of actual construction of the improvement. Performance guarantees shall be governed by this section.

A. Form of Guarantee. Performance Guarantees shall be in a form approved by the city attorney Approvable methods of performance guarantee include irrevocable standby letters of credit to the benefit of the city issued by a recognized lending institution, certified checks, dedicated bank accounts or allocations of construction loans held in reserve by the lending institution for the benefit of the city. The form of guarantee shall be specified by the City Engineer and, prior to execution and acceptance by the city shall be reviewed and approved by the City Attorney. The guarantee shall be filed with the City Engineer.

B. Timing of Gurantee. A permittee shall be required to provide a performance guarantee as follows.

1. After Final Approved Design By The City: A permitee may request the option of submitting a performance guarantee when prepared for temporary/final occupancy. The guarantee shall be one hundred twenty percent of the estimated cost of constructing the remaining public improvements as submitted by the permittee's engineer. The engineer's estimated costs shall be supported by a verified engineering estimate and approved by the City Engineer.
2. Before Complete Design Approval And Established Engineered Cost Estimate: A permitee may request the option of submitting a performance guarantee before public improvements are designed and completed. The guarantee shall be one hundred fifty percent of the estimated cost of constructing the public improvements as submitted by the permittee's engineer and approved by the City Engineer. The engineer's estimated costs shall be supported by a verified engineering estimate and approved by the City Engineer. This scenario applies for a fee-in-lieu situation to ensure

adequate funds for the future work involved in design, bid, contracting, and construction management and contract closeout. In this case, the fee-in-lieu must be submitted as cash, certified check, or other negotiable instrument as approved to form by the City Attorney.

C. Duration of the Guarantee. The guarantee shall remain in effect until the improvement is actually constructed and accepted by the city. Once the city has inspected and accepted the improvement, the city shall release the guarantee to the permittee. If the improvement is not completed to the city's satisfaction within the time limits specified in the permit approval, the City Engineer may, at their discretion, draw upon the guarantee and use the proceeds to construct or complete construction of the improvement and for any related administrative and legal costs incurred by the city in completing the construction, including any costs incurred in attempting to have the permittee complete the improvement. Once constructed and approved by the city, any remaining funds shall be refunded to the permittee. The City shall not allow a permittee to defer construction of improvements by using a performance guarantee, unless the permittee agrees to construct those improvements upon written notification by the city, or at some other mutually agreed-to time. If the permittee fails to commence construction of the required improvements within six months of being instructed to do so, the city may, without further notice, undertake the construction of the improvements and draw upon the permittee's performance guarantee to pay those costs.

Oregon City Municipal Code
Chapter 16.16 Minor Partitions—Process and Standards

16.16.010 Purpose and General Provisions.

A. Minor Partitions shall be processed as a Type II decision by the Community Development Director in the same manner as set forth in Section 16.04.020.A and the applicable provisions in Chapters 16.16 12.04, 16.12 and 17.50 of the Oregon City Municipal Code as well as any other applicable chapter. A minor partition is defined as a single division of land into two or three lots. Approval shall be granted only upon determination that all applicable requirements of this title and ORS Chapter 92 have been met.

B. If a parcel of land to be partitioned will create lots large enough to be divided again, the applicant shall provide a hypothetical non-binding plan or "shadow plat" depicting possible future development of the resulting lots.

C. Lot Size Limitations for Partitions. A parcel of land or the aggregate of contiguous parcels under the same ownership containing sufficient net buildable area to be subdivided by the minimum lot size requirements of the underlying zone into 4 or more lots shall be subject to the Subdivision procedures and standards specified in Sections 16.08 and 16.12. The calculation of the net buildable area for the parcel or lot to be divided shall be determined by the Community Development Director.

D. A parcel of land in existence at the time this ordinance was adopted may be partitioned once if solely for the purpose of segregating one separate smaller parcel for an existing or proposed single-family house. The original parcel shall be exempt from the Lot Size Limitation for Partitions found in (C) above. The parcel to be created for the single-family house shall not contain sufficient lot area to allow further partitioning under the standards of the applicable existing zone including the use of administrative variances.

16.16.015 Preapplication Conference Required.

Before the city will accept an application for a partition, the applicant must attend a preapplication conference under Section 17.50.

16.16.020 Minor Partition Application Submission Requirements.

A minor partition application shall include twelve copies of the proposed partition to the Community Development Director on a reproducible material, drawn at a minimum scale of one-inch equals one hundred feet with the following information:

A. A completed land use application form as provided by the planning division;

B. Legal descriptions of the parent parcel(s) and a preliminary plat map;

C. The name and address of the owner(s) and the representative, if any;

D. County tax assessment map number(s) of the land to be partitioned;

E. The map scale and north point;

F. Approximate courses and dimensions of all parts of the partition;

G. Around the periphery of the proposed minor partition, the boundary lines and names of adjacent minor partitions and subdivisions, streets and tract lines of adjacent parcels of property;

H. The location, width and names of all existing or platted streets, other public ways and easements within the proposed partition, and other important features, such as the general outline and location of permanent buildings, pedestrian/bicycle access ways, watercourses, power lines, telephone lines, railroad lines, gas lines, water lines, municipal boundaries and section lines;

I All areas designated as being within an overlay district

J. A connectivity analysis may be required as directed at the pre-application conference. If required, the partition connectivity analysis shall be prepared by an engineer licensed by the State of Oregonwhich describes the existing and future vehicular, bicycle and pedestrian connections between the proposed partition and existing or planned land uses on adjacent properties. The connectivity analysis shall include shadow plats of adjacent properties demonstrating how lot and street patterns within the

proposed partition will extend to and/or from such adjacent properties and can be developed meeting the existing Oregon City Municipal Code design standards.

16.16.025 Frontage Width Requirement.

For parcels of land created by a minor partition the parcels shall have a minimum of twenty feet of frontage on an existing public, county, state or federal road or street (unless as otherwise permitted in OCMC Chapter 16.16).

16.16.030 Flag Lots – R-10, R-8, R-6, and R-3.5.

A. Flag lots may be permitted in Partitions only where the configuration, topography, or an existing dwelling unit is located on the property so that it would otherwise preclude the partitioning and development of the property.
B. A joint accessway shall be provided unless the existing topography of the site or the dwelling unit is located on the property to prevent a joint accessway. A perpetual reciprocal access easement and maintenance agreement shall be recorded for the joint accessway, in a format acceptable to the city attorney.
C. Access ways shall have a pavement width of at least sixteen feet to service one to two units or twenty feet to service three or more units. A fire access corridor of at least twenty feet shall be provided to all parcels with a minimum pavement width of sixteen feet to service two units or twenty feet to service three or more units. At least 6 inches of shoulder on each side of the fire access corridor shall be provided in order that construction work does not infringe on adjacent properties. A narrower pavement width may be approved by the Fire District and Planning Division. The approval may require that additional fire suppression devices be provided to assure an adequate level of fire and life safety. No vehicular obstruction, including trees, fences, landscaping or structures, shall be located within the fire access corridor.
D. The pole must connect to a public street.
E. The pole must be at least 8 feet wide for its entire length.
F. The pole must be part of the flag lot and must be under the same ownership as the flag portion of the lot.

16.16.035 Pavement Requirements.

Accessways for lots created through the minor partitioning process shall satisfy the requirements of Section 16.16.040 and 16.16.050. If the proposed accessway exceeds one hundred fifty feet in length the accessway shall conform to Fire District standards and shall be paved to a minimum width of twenty feet unless an alternative is approved by the Planning Division and Fire District. If more than two residences are served, a turnaround for emergency vehicles shall be provided. The turnaround shall be approved by the City Engineer and Fire District. Improvements shall comply with Chapter 16.12, Minimum Improvements and Design Standards for Land Divisions.

16.16.040 Final Recordable Partition Plat.

If the partition application is approved, the applicant shall prepare a final partition plat that meets all applicable requirements and conditions of the planning manager decision, and the applicable requirements of ORS Chapter 92. The applicant shall then submit the final plat for signature by the appropriate city official prior to recording with the county.

16.16.045 Final Minor Partition Plat Requirements.

The City shall review the final partition plat for conformance with any conditions, required permits for access to facilities owned by another jurisdiction, and the applicable requirements of ORS Cbapter 92. The final partition plat shall contain, or be accompanied by, the following information:
A. The city planning file number, located just below the title block;

B. The lines and names of all streets or other public and private ways, pedestrian/bicycle accessways, parks, playgrounds and easements intended to be dedicated for public use, or granted for use of the owners within the petition;
C. The length and bearings of all straight lines, curves, radii and arcs of all curves.
D. Street center line control based on recorded city control surveys for street center lines, if applicable;
E. The names or official reference numbers of all recorded subdivision or partition plats immediately adjacent to the land division;
F. Building envelopes indicating compliance with setbacks. This shall be shown on a separate copy of the final plat;
G. All homeowners' agreements, maintenance agreements, articles of incorporation, bylaws and CC&Rs. These matters shall be reviewed and verified by the city attorney for conformance with state and local requirements before recording with the final plat;
H. A declaration shall appear on the face of the final plat that conforms with the City's final plat review checklist as published by the City Engineer.

Oregon City Municipal Code
Chapter 16.20 Property Line Adjustments and Abandonment Process and Standards

16.20.010 Purpose and general provisions.

The Community Development Director under the applicable provisions in Chapter 17.50 shall process applications for property line adjustments and abandonments as a Type I decision. Approval shall be granted only upon determination by the Community Development Director that all applicable requirements of this title and ORS Chapter 92 have been met.

16.20.020 Adjustment/abandonment submission requirements.

An application for a property line adjustment or abandonment shall include two copies of the following documents submitted to the Community Development Director:

A. A completed application, on a form as provided by the Planning Division;

B. A boundary survey prepared by an Oregon professional land surveyor in accordance with ORS 92.060(7) except where the application proposes the relocation of a currently monumented common boundary of a lot in a subdivision or a parcel in a partition when the adjusted property line is a distance of even width along the common boundary. The survey shall include in its title the following: "Proposed Property Line Adjustment Survey," shall identify the city planning file number and approval date immediately below the title block with space for signature and date by the Community Development Director;

C. Legal descriptions of the parent parcels to be adjusted and the resulting parcels to be created;

D. A current deed report for the subject property(ies)

E. A receipt from the county assessor's office indicating that all taxes for the lot or parcels involved are paid in full for the preceding tax year.

16.20.040 Adjustment/abandonment approval standards.

All parcels created through a lot line adjustment or abandonments shall conform to the applicable requirements of this title (including the standards within the zoning designation (lot width, depth, lot coverage, etc) as well as access and frontage requirements of OCMC Chapter 16.16, ORS 92.010 to ORS 92.160, and any other applicable city or state law. The Community Development Director shall determine if the applicant's submission complies with these standards, and issue to the applicant a notice of decision consistent with Section 17.50.120. The Community Development Director decision is final and not appealable to any other decision-maker within the city.

Chapter 17.02 General Provisions

17.02.010 Title.

This title shall be known and cited as the "zoning code of Oregon City, Oregon."

17.02.015 Purpose.

The purpose of this title is to promote public health, safety and general welfare through standards and regulations designed to provide adequate light and air; to secure safety from fire and other dangers; to lessen congestion in the streets; to prevent the overcrowding of land; to assure opportunities for effective utilization of land; to provide for desired population densities; and to facilitate adequate provision for transportation, public utilities, parks and other provisions set forth in the Oregon City Comprehensive Plan and the Oregon Land Conservation and Development Commission Statewide Planning Goals.

17.02.020 Scope.

This title applies to all public and private lands situated within the boundaries of the city. In interpretation and application, the provisions of this title shall be held to be minimum requirements adopted for the public health, safety and general welfare. Whenever the requirements of this title differ from the requirements of any other lawfully adopted rules, regulations or ordinances, the most restrictive or those imposing the higher standards shall govern.

Oregon City Municipal Code
Chapter 17.04 Definitions

17.04.005 Generally

A. As used in this title, words in the present tense include the future; the singular number includes the plural and the plural number includes the singular; unless the context clearly indicates the contrary, the word "shall" is mandatory and not discretionary; the word "may" is permissive; the masculine gender includes the feminine and neuter; and the term "this title" shall be deemed to include the text of this title and accompanying zoning maps and all amendments hereafter made thereto.
B. Whenever the following words or terms and their derivatives are used in this title, they shall have the meaning herein ascribed to them, unless the context makes such meaning repugnant thereto.

17.04.010 Accessory Building

"Accessory building" means a detached structure subordinate in size and use, but located on the same lot as, a principal building.

17.04.015 "Accessory Dwelling Unit" (ADU)

"Accessory Dwelling Unit" (ADU) means a residential dwelling unit located on the same lot as a single-family dwelling, that is not a recreational vehicle. The habitable living unit provides basic living requirements including permanent cooking, and toilet facilities and may be either within the same building as the single-family dwelling unit or in a detached building.

17.04.020 Access Control

"Access control" means the regulation of public access rights to and from properties abutting public rights-of-way by the construction of physical barriers or conveyance to the city of a property interest (reserve strip) that prevents access to the public right-of-way.

17.04.025 Accessway

"Accessway" means any public or private way that is created to provide ingress or egress for persons to one or more lots, parcels, areas, or tracts of land. The term "accessway" includes highway, streets, roads, avenues, alleys or similar designations.

17.04.030 Accessway, Pedestrian/Bicycle

"Accessway, pedestrian/bicycle" means any off-street path or way as described in Chapter 12.24, intended primarily for pedestrians or bicycles and which provides direct routes within and from new developments to residential areas, retail and office areas, transit streets and neighborhood activity centers.

17.04.035 Access, Vehicular

"Vehicular access" means an improved roadway, either public or private, providing automobile entrance and/or exit from an approved public street.

17.04.040 Alley

"Alley" means a public or private way not more than twenty feet wide that provides access to a property or properties from a side other than the designed front of the property.

17.04.045 Alteration

"Alteration" means the addition to, removal of or from, or physical modification or repair of, any exterior part or portion of a landmark or structures in an historic or conservation district. In an historic district any physical change shall be considered a form of alteration and shall be treated as such, except repair and maintenance or change of copy.

17.04.050 Amateur Radio Operators

"Amateur Radio Operator" means a ham radio operators, are licensed by the United States Government.

17.04.055 Anadromous Fish-Bearing Stream

"Anadromous fish-bearing stream" means a stream or portion of a stream which is identified by resolution of the city commission as spawning or rearing habitat for those species of fish which return to rivers from the sea for breeding.

17.04.060 Antenna

"Antenna" means any pole, panel, rod, reflection disc or similar device used for the transmission or reception of radio frequency signals, including, but not limited to omni-directional antenna (whip), directional antenna (panel), micro cell, and parabolic antenna (dish). The antenna does not include the support structure or tower.

17.04.065 Appeal

"Appeal" for the purpose of Chapter 17.42 means a request for a review of the interpretation of any provision of this chapter or a request for a variance.

17.04.070 Applicant

"Applicant" means the party or parties who submit an application for approval of a quasi-judicial permit under city code Titles 16 or 17.

17.04.075 Application

"Application" means any request for approval of a permit or a legislative amendment to the city's land use regulations, comprehensive plan or related maps.

17.04.080 Approval Criteria and Approval Standards

"Approval criteria" and "approval standards" mean all standards which must be met in order to approve an application. Depending upon the specific application, approval criteria include standards contained in this code, the Oregon City comprehensive plan and applicable state law.

17.04.081 Aquifer

"Aquifer" is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

17.04.082 Arborist, Certified

"Certified Arborist" means a professional tree service provider whose certification is regulated and current and maintained with the International Society of Arboriculture (ISA). To use the term "Certified Arborist", an individual must have three years of experience and have passed an ISA certification exam that tests a variety of tree care knowledge.

17.04.085 Architect

"Architect" means an architect licensed by the state of Oregon.

17.04.090 Architectural Significance

"Architectural significance" for the purposes of Chapter 17.40 means that the structure or district:

1. Portrays the environment of a group of people in an era of history characterized by a distinctive architectural style;
2. Embodies those distinguishing characteristics of an architectural-type specimen;
3. Is the work of an architect or master builder whose individual work has influenced the development of the city; or
4. Contains elements of architectural design, detail, materials or craftsmanship which represents a significant innovation.

17.04.095 Arterial

"Arterial" means any street so designated in the city's transportation master plan.

17.04.100 Attachment

"Attachment" means for the purposes of Chapter 17.80, an antenna or other piece of related equipment affixed to a transmission tower, building, light, utility pole, or water tower.

17.04.105 Area of Special Flood Hazard

"Area of special flood hazard" means the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year.

17.04.110 Array

"Array" means the combination of antennas mounted on a support structure or support tower.

17.04.115 Assisted Living Facility

"Assisted living facility" means a facility established for profit or nonprofit, which provides nursing care and related medical services on a 24-hour per day basis to sixteen or more individuals because of illness, disease, or physical or mental infirmity. Provides care for those persons not in need of hospital care. Patients do not reside in self-contained dwelling units.

17.04.120 Auxiliary Support Equipment

"Auxiliary Support Equipment" means for the purposes of Chapter 17.80 all equipment necessary to provide wireless communication signals and data, including but not limited to, electronic processing devices, air conditioning units, and emergency generators. For the purpose of this chapter, auxiliary support equipment shall also include the shelter, cabinets, and other structural facilities used to house and shelter necessary equipment. Auxiliary support equipment does not include support towers or structures.

17.04.125 Bankfull Stage or Bankfull Flow

"Bankfull stage" or "bankfull flow" means the stage or elevation of a stream at which water overflows the natural banks of streams or other waters of this state. The bankfull stage or flow may be approximated using either the two-year recurrence interval flood elevation or one foot measured vertically above the ordinary mean higb water line.

17.04.130 Base Flood

"Base flood" means the flood having a one percent chance of being equaled or exceeded in any given year. Also referred to as the one-hundred-year flood.

17.04.135 Basement

"Basement" means a story partly underground. A basement shall be counted as a story in accordinance with the accepted Building Division definitions.
For the purpose of Chapter 17.42 basement means any area of the building having its floor subgrade (below ground level) on all sides.

17.04.140 Design Flood Elevation

"Design flood elevation" means the elevation of the base flood or one-hundred-year storm as defined in FEMA (Federal Emergency Management Agency) flood insurance studies, or the highest flood of record since the adoption of the flood insurance maps, or, in areas without FEMA floodplains, the elevation of the twenty-five-year storm, or the edge of mapped flood-prone soils or similar methodologies whichever is higher.

17.04.145 Bed and Breakfast Inns / Boardinghouse

"Bed and breakfast inns" means building(s) which provides overnight accommodations to the public for fewer than 30 consecutive days.

17.04.150 Beneficial Uses or Beneficial Water Uses

"Beneficial uses" or "beneficial water uses" means, as defined by the Oregon Department of Water Resources, use of an in stream public use of water for the benefit of an appropriator for a purpose consistent with the laws and the economic and general welfare of the people of the state and includes, but is not limited to, domestic, fish life, industrial, irrigation, mining, municipal, pollution abatement, power development, recreation, stock water and wildlife uses.

17.04.153 Board

"Board" for the purposes of OCMC 17.40 means the Historic Review Board.

17.04.155 Building, Compatible

"Compatible building" means for the purposes of OCMC Chapter 17.40, buildings in the Canemah National Register Historic district, which date from 1910 to the 1950's.

17.04.160 Building, Historic

"Historic building" means for the purposes of Chapter 17.40, any primary, secondary or compatible building in the Canemah National Register Historic district.

17.04.165 Building of Primary Historic Significance

"Building of primary historic significance" shall include buildings in the Canemah National Register Historic district shall include buildings dating from prior to 1880 which are primarily one and one-half or two-story frame structures built in the Gothic Revival and Classic Revival styles. These buildings are primarily single-family dwellings.

17.04.170 Building of Secondary Historic Significance

"Building of secondary historic significance" shall include buildings in the Canemah National Register Historic district dating from 1880 to 1940 which are predominantly rural farm house style and bungalows. These buildings are primarily single-family dwellings.

17.04.175 Camouflage

"Camouflage" for the purposes of Chapter 17.80 means the design and construction of a wireless communications facility (WCF) to resemble an object that is not a wireless communication facility and which is typically present in the environment.

17.04.180 Certified Engineering Geologist

"Certified Engineering Geologist" is any Registered Geologist who is certified in the specialty of Engineering Geology under provisions of ORS 672.505 to 672.705.

17.04.185 Citizen Involvement Committee

"Citizen involvement committee" means an officially recognized advisory body on citizen involvement with one representative from each neighborhood association.

17.04.190 City

"City" means the city of Oregon City.

17.04.195 City Engineer

"City engineer' means the engineer manager for the city, their duly authorized representative(s), or the city's duly authorized representative(s) as designated by the city manager.

17.04.200 Code

"Code" means the Oregon City Municipal Code.

17.04.205 Commercial Vehicles

"Commercial vehicle" means a vehicle of over eight thousand pounds gross weight that is designed for or being used to transport merchandise, or a vehicle of less than eight thousand pounds gross weight.

17.04.210 Collector

"Collector" means any street so designated in the city's transportation master plan.

17.04.215 Collocation

"Collocation" means the use of a common wireless communications support structure or tower for two or more antenna arrays.

17.04.220 Community Development Director

"Community Development Director" means the manager of the Planning Division or the Community Development Director's designee.

17.04.225 Comprehensive Plan

"Comprehensive plan" means the city of Oregon City comprehensive plan.

17.04.230 Construction Area

Defined as right-of-way, public utility easements, and within the building footprint of a building site for any mixed-use, commercial or industrial development, or if a residential development, within the allowable building footprint permitted by the setback requirements of the zone district.

17.04.235 Constructed Wetlands

"Constructed wetlands" means wetlands developed as a water quality or quantity facility, subject to change and maintenance as such. These areas must be clearly defined and separated from naturally occurring or created wetlands.

17.04.240 Crest

"Crest" of slope means the point of curvature where the ground surface descends from the top of a slope.

17.04.245 Highly Constrained Residential Lot

A residential vacant lot of record that had less than 5,000 square feet of buildable area, with minimum dimensions of 50 feet by 50 feet, remaining outside the Natural Resource Overlay District.

17.04.250 Highly Constrained Commercial Lot

A commercial or industrially zoned lot of record that has more than 75% of its area covered by the Natural Resource Overlay District.

17.04.255 Commercial Vehicles

"Commercial vehicle" means:

A. A vehicle of over eight thousand pounds gross weight that is designed for or being used to transport merchandise, or a vehicle of less than eight thousand pounds gross weight with the business name of the user permanently exhibited on one or both of its sides that is designed and being used to transport merchandise;
B. A station wagon or other vehicle with the business name of the user permanently exhibited on one or both of its sides, when used for transporting merchandise.

17.04.260 Cottage Housing

"Cottage Housing" means two or more single-family structures on a single lot; allowed in single-family and two-family dwelling districts. Cottage housing provides an option that preserves the privacy and personal space of a detached house in a smaller and less costly unit. Cottages provide a way to trade quantity of space for quality of space.

17.04.265 Created Wetlands

"Created wetlands" means wetlands developed in an area previously identified as a non-wetland to replace, or mitigate wetland destruction or displacement. A created wetland shall be regulated and managed the same as an existing wetland.

17.04.270 Cul-de-sac

"Cul-de-sac" means a street not more than three hundred fifty feet in length having one end open to traffic and being terminated by a vehicle turnaround. The cul-de-sac is measured from the edge of the right-of-way of the intersecting street to the edge of the pavement at the end of the cul-de-sac.

17.04.275 Day Care Facility

"Day care facility" means a facility that provides regular day care services to children under thirteen years of age, including a day nursery, nursery school group or similar unit operating under any name. A day care facility shall not include services provided by a physician or nurse, or facilities operated primarily for education or supervised training or instruction, or day care provided by a "babysitter" or "family day care provider" as defined in this chapter. A day care facility caring for ten or more children shall satisfy the certification requirements of the Children's Services Division.

17.04.280 Debris

"Debris" means discarded man-made objects that would not occur in an undeveloped stream corridor or wetland. Debris includes, but is not limited to, tires, vehicles, litter, scrap metal, construction waste, lumber, plastic or styrofoam. Debris does not include objects necessary to a use allowed by this chapter, or ornamental and recreational structures. Debris does not include existing natural plant materials or natural plant materials which are left after flooding, downed or standing dead trees or trees which have fallen into protected water features.

17.04.285 Decision-Maker

"Decision-maker" means the city entity rendering a decision on an application. For applications made under this title, the decision-maker will be either the Community Development Director, Planning Commission or the City Commission as designated by Chapter 17.50.

17.04.290 Demolish

"Demolish" means to raze, destroy, dismantle, deface or in any other manner cause partial or total ruin of the designated landmark or structure in an historic or conservation district.

17..04.295 Design Flood Elevation

"Design flood elevation" means the elevation of the base flood or one hundred-year storm as defined in FEMA (Federal Emergency Management Agency) flood insurance studies, or the highest flood of record since the adoption of the flood insurance maps, or, in areas without FEMA floodplains, the elevation of the twenty-five-year storm, or the edge of mapped flood-prone soils or similar methodologies whichever is higher.

17.04.300 Development

"Development" means a building or grading operation, making a material change in the use or appearance of a structure or land, dividing land into two or more parcels, partitioning or subdividing of land as provided in ORS 92.010 to 92.285 or the creation or termination of an access right.

For the purpose of Chapter 17.42 "development" means any man-made change to improved or unimproved real estate, including but not limited to buildings, or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.

For the purpose of Chapter 17.47, "development" means any man-made change to improved or unimproved real estate, including but not limited to the construction of buildings or other structures, sewers, streets or other structures or facilities, mining, dredging, paving, filling or grading in amounts greater than ten cubic yards on any lot or excavation. In addition, any other activity that results in the removal of more than ten percent of the existing vegetation in the water quality resource area on a lot is defined as development. Development does not include the following:

1. Stream enhancement or restoration projects approved by the city;
2. Farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of this chapter; and
3. Construction on lots in subdivisions meeting the criteria of ORS 92.040(2)(1995).

For the purpose of Chapter 17.49 "development" means any manmade change defined as the construction of buildings or other structures, mining, dredging, paving, filling, grading, or site clearing, and grubbing in amounts greater than ten cubic yards on any lot or excavation. In addition, any other activity that results in the removal of more than ten percent of the existing vegetation in the water quality resource area on a lot is defined as development. Development does not include the following:

1. Stream enhancement or restoration projects approved by the city;
2. Farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of this chapter; and

Construction on lots in subdivisions meeting the criteria of ORS 92.040(2) (1995).

17.04.305 Development Site

"Development site" means any lot or lots on any part of which development is taking place.

17.04.310 Direct

"Direct" when used in connection with pedestrian or bicycle access, means the shortest practicable connection or access between two points, which in no instance should involve out-of-direction travel more than fifty percent longer than the straight line distance between two points.

17.04.315 Director

"Director" means the director of community development or designee.

17.04.320 Disturb

"Disturb" means man-made changes to the existing physical status of the land, which are made in connection with development. The following uses are excluded from the definition:

1. Enhancement or restoration of the water quality resource area;
2. Planting native cover identified in the Oregon City native plant list as adopted by Oregon City commission resolution;
3. Installation of erosion control measures pursuant to an approved erosion and sediment control plan under Chapter 17.47.

17.04.325 District

"District" means the area within a designated historic district, conservation district or historic corridor as provided by the zoning maps of the city.

17.04.330 Dormer

"Dormer" is a window vertical in a roof or the roofed structure containing such a window. A dormer is considered an alteration to a building, as it stays within the roof line and does not increase the floor area dimensions.

17.04.335 Dwelling Unit

"Dwelling unit" means a habitable living unit that provides basic living requirements including permanent cooking, and toilet facilities.

17.04.340 Dwelling Apartment or Multi-Family or Condominium

"Dwelling Apartment or Multi-Family or Condominium" is a structure located on one tax lot and containing three or more dwelling units in any vertical or horizontal arrangement.

17.04.345 Dwelling, Attached

"Attached dwelling" means a dwelling which is joined to another dwelling at one or more sides by a party wall or walls.

17.04.350 Dwelling, Two-Family or Duplex

"Two-family dwelling or duplex" means a building designed or used for residence purposes by not more than two families and containing two dwelling units per lot.

17.04.355 Elevated Building

"Elevated building" for insurance purposes means a nonbasement building which has its lowest elevated floor raised above ground level by foundation walls, shear walls, post, piers, pilings, or columns.

17.04.360 Emergency

"Emergency" means any man-made or natural event or circumstance causing or threatening loss of life, injury to person or property, and includes, but is not limited to, fire, explosion, flood, severe weather, drought, earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

17.04.365 Engineer

"Engineer" means a registered professional engineer licensed by the State of Oregon (P.E).

17.04.370 Engineering Geologist

"Engineering geologist" means a registered professional engineering geologist licensed by the state of Oregon (CEG).

17.04.375 Enhancement

"Enhancement" means the process of improving upon the natural functions and/or values of an area or feature which has been degraded by human activity. Enhancement activities may or may not return the site to a pre-disturbance condition, but create/recreate processes and features that occur naturally.

17.04.380 Entertainment Centers and Arcades

"Entertainment centers and arcades" means a place open to minors where three or more mechanical or electronic amusement devices are located as either the primary or a secondary use.

17.04.385 Erosion

"Erosion" is the movement of soil, rocks, and other surface materials by wind, water, or mechanical means.

17.04.390 Excavation

"Excavation" is any act of development by which soil, earth, sand, gravel, rock or any similar material is cut into, dug, quarried, uncovered, removed, displaced, relocated, exposed or bulldozed, including the conditions resulting therefrom.

For the purpose of Chapter 17.47 "excavation" means: any act of development by which soil or rock is cut into, dug, quarried, uncovered, removed, displaced, exposed or relocated.

17.04.395 Existing Manufactured Home Park or Subdivision

"Existing manufactured home park or subdivision" means a manufactured home park or

subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the ordinance codified in this chapter.

17.04.400 Expansion to an Existing Manufactured Home Park or Subdivision

"Expansion to an existing manufactured home park or subdivision" means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

17.04.405 Exterior

"Exterior" for the purpose of Chapter 17.40 means any portion of the outside of a landmark building, structure, or site in a district or any addition thereto.

17.04.410 Façade

"Façade" means the exterior wall(s) or elevation(s) of a structure.

17.04.415 Family

"Family" means an individual or two or more persons related by blood, legal adoption, guardianship, domestic partners, common-law habitation, or marriage, plus not more than five additional persons, including foster and shelter care persons, or up to five unrelated persons, all living together as a single housekeeping unit in a dwelling unit. Every additional group of five or less persons living in such housekeeping unit is considered a separate family. Facilities that are operated for the purpose of providing care that includes a planned treatment or training program, with the exception of foster care of five or fewer persons, are not "families."

17.04.420 Family Day Care Provider

"Family day care provider" means a day care provider who regularly provides day care to fewer than thirteen children, including the children of the provider, regardless of full-time or part-time status, in the provider's home in the family living quarters. Provisions of day care to thirteen or more children in the home of the provider shall constitute the operations of a "day care facility," as defined in this chapter, and shall be subject to the requirements of this title for day care facilities. A family day care provider to ten or more children shall satisfy the certification requirements of the Children's Services Division.

17.04.425 Federal Aviation Administration (FAA)

"Federal Aviation Administration (FAA)" means the federal regulatory agency responsible for the safety of the nation's air traffic control system, including airspace impacted by wireless communications support structures and towers.

17.04.430 Federal Communications Commission (FCC)

"Federal Communications Commission (FCC)" means the federal regulatory agency charged with regulating interstate and international communications by radio, television, wire, satellite, and cable.

17.04.435 Fill

"Fill" means any material such as, but not limited to, sand, gravel, soil, rock or other natural or manmade material placed by artificial means.

17.04.440 Final Action and Final Decision

"Final action" and "final decision" mean the city's final decision on a permit application for which there is either no appeal to another decision-maker within the city, or, if there is the possibility of a local appeal, an appeal was not timely perfected in accordance with Section 17.50.190 of this chapter. A decision is deemed to be final on the date that written notice of the decision is mailed to those entitled to notice of the decision.

17.04.445 Flag Lot

"Flag lot" means a lot or parcel that has a narrow frontage on a public right-of way and a narrow accessway which serves the main body of the lot used for building.

17.04.450 Flood or Flooding

"Flood" or "flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of inland or tidal waters; and/or
2. The unusual and rapid accumulation of runoff of surface waters from any source.

17.04.455 Flood Insurance Rate Map

"Flood insurance rate map" means the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazard and the risk premium zones applicable to the community.

17.04.460 Flood Insurance Study

"Flood insurance study" means the official report provided by the Federal Insurance Administration that includes flood profiles, the flood boundary-floodway map, and the water surface elevation of the base flood.

17.04.465 Flood Management Areas

"Flood management areas" means all lands contained within the one-hundred-year floodplain, flood area and floodway as shown on the Federal Emergency Management Agency flood insurance rate maps, floodway maps and the area of inundation for the February 1996 flood.

17.04.470 Floodplain

"Floodplain" means the land area identified and designated by the United States Army Corps of Engineers, the Oregon Division of State Lands, FEMA, or city of Oregon City that has been or may be covered temporarily by water as a result of a storm event of identified frequency. It is usually the flat area of land adjacent to a stream or river formed by floods.

17.04.475 Floodway

"Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

17.04.480 Floodway Fringe

"Floodway fringe" means the area of the floodplain, lying outside the floodway, which does not contribute appreciably to the passage of floodwater, but serves as a retention area.

17.04.482 Foot-candle

A unit of measurement referring to illumination incident to a single point. One foot-candle is equal to one lumen uniformly distributed over an area of one square foot.

17.04.485 Front Façade

"Front façade" means the exterior wall/foundation of a building exposed to the front lot line. This shall be the most architecturally significant elevation of the building, commonly including a front door or main entrance. If the most architecturally significant elevation of the building is not exposed to the front lot line, the Community Development Director shall determine the front façade.

17.04.490 Front Lot Line

"Front lot line" means a lot line abutting a street. For corner lots, the front lot line is that with the narrowest frontage. When the lot line abutting a street is curved, the front lot line follows the curve. For a flag lot, the front lot line is the shortest lot line adjoining the pole portion of the lot, excluding the unbuildable portion of the pole (see Figure 1, codified at the end of this title).

17.04.495 Frontage

"Frontage" means that portion of a parcel of property which abuts a dedicated public street or highway or an approved private way.

17.04.497 Fully Shielded or Cut-off Light Fixture

Any outdoor light fixture shielded in such a manner that all light emitted by the fixture is projected below the horizontal as determined by a photometric test or certified by the manufacturer. For purposes of this standard, "cutoff angle" is defined as the angle formed by a line drawn from the direction of light rays at the light source and a line perpendicular to the ground from the light source above from which no light is emitted.

17.04.500 Garage

"Garage" means an attached or detached structure(s), or portion thereof used or designed to be used for the parking or storage of vehicles.

17.04.505 Geological Assessment

"Geological assessment" is an assessment prepared and stamped by a Certified Engineering Geologist, detailing the surface and subsurface conditions of the site and delineating the areas of a property that might be subject to specified geologic hazards.

17.04.510 Geologic Hazard Areas

"Geologic hazard areas" mean:

1) Any area identified on the City's Steep Slope and Landslide Area map;
2) Area within 200 feet of the crest or toe of a slope that is 25% or greater
3) Areas with a slope of twenty-five percent or more;
4) Geologic Hazards areas identified by the State of Oregon Department of Geology and Mineral Industries (DOGAMI) in Bulletin 99, Geology and Geologic Hazards of Northwestern Clackamas County, Oregon (1979);
5) Any other area that is identified by a suitably qualified geotechnical engineer or engineering geologist who is licensed in Oregon and derives his or her livelihood principally from that profession as being subject to soil instability, slumping or earth flow, high ground water level, landslide, or seismic activity.

17.04.515 Geologic Hazards Overlay Zone

"Geologic Hazards Overlay Zone" means the zone mapped by the City of Oregon City that includes areas identified in OCMC 17.44.020F.

17.04.520 Geotechnical Engineer

"Geotechnical Engineer" is a Professional Engineer, registered in the State of Oregon as provided by ORS 672.002 to 672.325, who by training, education and experience is qualified in the practice of geotechnical or soils engineering practices.

17.04.525 Geotechnical Remediation

"Geotechnical remediation" means construction designed to increase the factor of safety against earth movement.

17.04.530 Geotechnical Report

"Geotechnical report" is a report prepared and stamped by a Geotechnical Engineer, evaluating the site conditions and mitigation measures necessary to reduce the risks associated with development in geologically hazardous areas.

17.04.532 Glare

The reflection of harsh, bright light; and the physical effect resulting from high luminances or insufficiently shielded light sources in the field of view.

17.04.535 Grading

"Grading" is the act of excavating and filling.

17.04.540 Gross Floor Area

"Gross floor area" means the total enclosed floor area within buildings, measured in square feet, excluding basement areas used for storage or parking.

17.04.543 Habitat

"Habitat" means the location of natural resource areas that support fish and wildlife populations, including wetlands, riparian areas, natural areas, wooded areas, areas of significant trees or vegetation, and areas designated as being within the Natural Resource Overlay District.

17.04.545 Half Street

"Half street" means a portion of the width of a full street, usually along the edge of a subdivision.

17.04.550 Height

"Height of building" means a vertical distance measured from the average elevation of the finished grade along the street-facing elevation to one-half the vertical distance between the eaves and the highest ridge for a gable, hip or gambrel roof. For the purpose of Chapter 17.80Height shall mean the distance measured from the original grade at the base of the wireless communication facility to the highest point on the wireless communication facility, including the antenna(s) and lightning rod(s).

17.04.555 Heritage Tree

"Heritage Tree" is a tree or stand of trees that is of landmark importance to the City of Oregon City due to age, size, species, horticultural and ecological value or historical association.

17.04.560 Heritage Grove

"Heritage Grove" is at least two heritage trees separated by no more than twenty feet (20') on a property or properties.

17.04.565 Historical Significance

"Historical significance" means that the structure of district:
1. Has character, interest or value, as part of the development, heritage or cultural characteristics of the city, state or nation;
2. Is the site of an historic event with an effect upon society;
3. Is identified with a person or group of persons who had some influence on society; or
4. Exemplifies the cultural, political, economic, social or historic heritage of the community.

17.04.570 Historic Corridor

"Historic corridor" means that portion of a parcel of land that is a part of a designated linear historic feature such as the route of the Oregon Trail-Barlow Road.

17.04.575 Historic Site

"Historic site" means the structure and the property surrounding a landmark, a structure in an historic district, or a designated structure in a conservation district.

17.04.580 Home Occupation

"Home occupation" means an occupation carried on solely by the resident or residents of a dwelling unit as a secondary use, in connection with which no assistants are employed, other than

residents of the home, no commodities are sold other than services, no sounds are heard beyond the premises, and there is no display, advertisement or sign board except such signs as by this title may be permitted in the district where the home or occupation is situated, including such occupations as lawyer, public accountant, artist, writer, teacher, musician, home office of a physician, dentist or other practitioner of any of the healing arts, or practices of any art or craft of a nature to be conveniently, unobstructively and inoffensively pursued in a residential dwelling or accessory building of a residence, and not more than one-half of the square-footage is devoted to such use. The business may have off-site employees or partners provided that they do not report for work at the subject residence. No outdoor storage of materials or commercial vehicles associated with the business shall occur onsite.

17.04.585 Hotel

"Hotel" means a building which is designed or used to offer lodging, with or without meals, for compensation, primarily for overnight lodging.

17.04.586 Impervious Surface

Any nonvertical surface artificially covered or hardened so as to prevent or impede the percolation of stormwater water into the soil, including but not limited to roof tops excepting eaves, swimming pools, paved or graveled roads, and walkways or parking areas and excluding landscaping, surface water retention/detention facilities, access easements serving neighboring property, and driveways

17.04.587 Incandescent

A common form of artificial light in which a filament is contained in a vacuum and heated to brightness by an electric current.

17.04.590 Infrastructure Provider

"Infrastructure provider" for the purposes of Chapter 17.80 means an applicant whose proposal includes only the construction of new support towers or auxiliary structures to be subsequently utilized by service providers.

17.04.595 Institutional Development

"Institutional development" includes all public, semi-public and private community facilities and uses, including government office and maintenance facilities, educational facilities, research institutions, correctional institutions, museums, libraries, stadiums, hospitals, residential care facilities, auditoriums and convention or meeting halls, churches, parks and public recreational facilities, automobile parking structures, and other similar facilities and uses.

17.04.600 Interior Parking Lot Landscaping

"Interior parking lot landscaping" means landscaping located inside the surfaced area used for on-site parking and maneuvering.

17.04.605 Invasive Non-Native, Nuisance, Prohibited or Noxious Vegetation

"Invasive non-native," "nuisance," "prohibited" or "noxious vegetation" means plant species that have been introduced and, due to aggressive growth patterns and lack of

natural enemies in the area where introduced, spread rapidly into native plant communities, or which are listed as invasive, nuisance, prohibited or noxious plants on the Oregon City nuisance plant list.

17.04.610 Land Division

"Land division" means any partition or subdivision.

17.04.615 Landscaping

Landscaping. Site improvements which include lawn, garden, groundcover, trees, plants and other natural and decorative features, including but not limited to, patios or plazas open to the public or open commonly to residents and street furniture and walkways which are contiguous and integrated with plant material landscaped areas. The verification of plant materials requiring specific characteristics can be achieved by any of the following methods:
1) description in Sunset Western Garden Book (Editor Sunset Books, 1988 or later edition), or
2) The Oregon City Native Plant List;
3) City of Portland Native Plan List;
4) Metro Native Plant List;
5) by an appendix, definition, or other reference in the Zoning Code, or
6) by specific certification by a licensed landscape architect.

17.04.620 Landscape Area

"Landscape area" means land set aside and used for planting of grass, shrubs, trees or similar living plants.

17.04.625 Landslide

"Landslide" means the downslope movement of soil, rocks, or other surface matter on a site. Landslides may include, but are not limited to, slumps, mudflows, earthflows, debris flows, rockfalls and the source areas for above.

17.04.630 Lattice Tower

"Lattice tower" is a support tower characterized by an open framework of lateral cross members that stabilize the tower.

17.04.635 Legislative Action

"Legislative action" means any final decision of the city that approves or denies a request to amend the city's land use regulations, comprehensive plan or related maps and does not pertain to a particular property or small set of properties.

17.04.640 Limited Land Use Application

"Limited land use application" means an application for any use where the decision is based on discretionary standards designed to regulate the physical characteristics of a use permitted outright, including subdivision, site plan and design review or any other application which is processed pursuant to a Type II proceeding as provided in this chapter.

17.04.645 Live /Work Dwelling

"Live/work dwelling" a dwelling in which a business is designed to be operated on the ground floor. The ground floor commercial, personal service, or office space has visibility, signage and access from the primary street.

17.04.650 Loading Space

"Loading space" means an off-street space, having a paved surface, within a building or on the same lot with a building, for the temporary parking of a commercial vehicle or truck while loading or unloading merchandise or materials and which has direct access to a street or alley.

17.04.655 Local Street

"Local street" means any street so designated in the city's transportation master plan. Typically, a local street is a public street that serves abutting lands, is designed to carry a minimal amount and weight of traffic.

17.04.660 Lot

"Lot" and "legal lot" mean a single unit of land created by a subdivision which, at the time of creation, complied with all procedural and substantive requirements of any applicable local, state or federal law.

17.04.665 Lot, Corner

"Corner lot" means a lot abutting upon two or more streets at their intersection.

17.04.670 Lot Coverage

"Lot coverage" means the area of a lot covered by the footprint of all structures 200 square feet or greater (excluding decks and porches), expressed as a percentage of the total lot area.

17.04.675 Lot, Depth

"Lot depth" means the distance measured from the mid-point of the front lot lines to the mid-point of the opposite, usually rear lot line and generally at approximately right angles to the lot width.

17.04.680 Local Floodplain Administrator

"Local floodplain administrator" means the city's building official.

17.04.685 Lot, Interior

"Interior lot" means a lot other than a corner lot.

17.04.690 Lot Line Adjustment

"Lot line adjustment" means a relocation or elimination of all or a portion of the common property line between abutting properties that does not create an additional lot or parcel.

17.04.695 Lot of Record

"Lot of record" means a lot or parcel which has been legally recorded in the office of the county recorder by deed or contract of sale prior to the enactment of an ordinance or regulation by reason of which the lot or parcel no longer meets the dimensional or area requirements of the city.

17.04.700 Lot, Width

"Lot width" means the perpendicular distance measured between the midpoints of the two principal opposite side lot lines and generally at approximately right angles to the lot depth.

17.04.705 Lowest Floor

"Lowest floor" means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable nonelevation design requirements of this title found at Section 17.42.170(E)(4) or (5).

17.04.707 Low Impact Development Standard

Any construction technique approved by the City Engineer that is designed to provide on-site capture, treatment and infiltration of stormwater as a means to improve water quality, reduce the amount of impervious surface, and/or provide habitat benefits on a development site.

17.04.710 Major Modification

"Major modification" means any of the following changes from a previously approved permit, requiring the application to return through the same process as the original review:

1. For subdivisions or planned unit developments, an increase in the total number of dwelling units by ten percent or more, an increase in the number of multiple-family dwellings by more than ten percent, or a reduction in the amount of landscaping, open space or land reserved for a protected feature of ten percent or more;
2. For design review or conditional use permits for mixed use or commercial developments, an increase in the area of commercial space by more than ten percent;
3. For any site plan or design review approval, a reduction in the amount of landscaping, open space or land reserved for a protected feature of ten percent or more or the relocation of buildings, streets, access points onto the existing public right-of-way, utility easements, pedestrian/bicycle accessways, parking lots, landscaping, or other site improvements away from the previously approved general location;
4. For any prior approval, an increase in the amount of impervious surface on hillsides or unstable soils subject to regulation under city code Chapter 17.44 by ten percent or more;
5. Any change that renders the prior approved permit incompatible with surrounding lands or development in noncompliance with any of the conditions of approval or approval criteria.

17.04.715 Main Building Entrance

"Main building entrance" means a primary entrance to a building, intended for use by residents, employees, customers, clients, visitors, messengers and members of the public.

17.04.720 Major Public Improvements

"Major public improvements" means the expenditure of public funds or the grant of permission by a public body to undertake change in the physical character of lands or the making of public improvements within a district, except for the repair or maintenance of public or private improvements within a district.

17.04.725 Manager

"Manager" means the city manager or the city manager's designated representative.

17.04.730 Manufactured Home

"Manufactured home" means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."

17.04.735 Manufactured Home Park or Subdivision

"Manufactured home park or subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

17.04.740 Map

"Map" means a final diagram, drawing or other graphical representation concerning a partition or subdivision.

17.04.745 Metro

"Metro" means the regional government of the Portland metropolitan area and the elected Metro Council as the policy-setting body of the government.

17.04.746 Metro ESEE Analysis

"ESEE"means Economic, Social, Environmental and Energy (ESEE) analysis and is the process by which Metro determined whether to allow, limit, or prohibit activities in the City's significant natural resource sites.

17.04.750 Micro Cell

"Micro cell" for the purposes of Chapter 17.80 means a wireless communications facility consisting of an antenna that is either: (a) four (4) feet in height and with an area of not more than five hundred eighty (580) square inches; or (b) if a tubular antenna, no more than four (4) inches in diameter and no more than six (6) feet in length.

17.04.755 Minor Modification

"Minor modification" means any changes from a previously approved permit which are less than a major modification.

17.04.760 Mitigation

"Mitigation" means the reduction of adverse effects of a proposed project by considering, in the following order:

1. Avoiding the impact altogether by not taking a certain action or parts of an action;
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
3. Rectifying the impact by repairing, rehabilitating or restoring the affected environment;
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action by monitoring and taking appropriate measures; and
5. Compensating for the impact by replacing or providing a comparable substitute.

17.04.765 Mitigation Measure

"Mitigation Measure" is an action designed to reduce project-induced geologically hazardous area impacts.

17.04.770 Monopole

"Monopole" means a support tower composed of a single upright pole, engineered to be self-supporting, and used to support one or more antenna(s) or array(s). A monopole does not include towers requiring guy wires or lattice cross supports.

17.04.775 Motel

"Motel" means a building or series of buildings in which lodging is offered for compensation primarily for overnight lodging d which is distinguished from a hotel primarily by reason of providing direct independent access to and adjoining parking for each rental unit

17.04.780 Multiple Family Residential Units

A structure located on one tax lot and containing three or more dwelling units in any vertical or horizontal arrangement.

17.04.785 Native Vegetation

"Native vegetation" means any vegetation listed on the Oregon City native plant list as adopted by Oregon City Commission resolution.

17.04.790 Natural Location

"Natural location" means the location of those channels, swales, and other non-manmade conveyance systems as defined by the first documented topographic contours existing for the suhject property either from maps or photographs, or such other means as appropriate.

17.04.795 Nearby

"Nearby," when used in connection with pedestrian or bicycle access, means uses within one-quarter mile distance which can reasonably be expected to be used by pedestrians, and uses within two miles distance which can reasonably be expected to be used by bicyclists.

17.04.800 Neighborhood Activity Center

"Neighborhood activity center" refers to land uses which attract or are capable of attracting a substantial amount of pedestrian use. Neighborhood activity centers include, but are not limited to, parks, schools, retail store and service areas, shopping centers, recreational centers, meeting rooms, theaters, museums and other pedestrian oriented uses.

17.04.805 Neighborhood Association

"Neighborhood association" means a group whose membership is recognized by the City, open to residents, property owners and owners of businesses located in the neighborhood. This group makes comments and recommendations on problems, policies and projects in the neighborhood.

17.04.810 Net Developable Area

"Net Developable Area" means the area of a parcel of land or the aggregate of contiguous parcels under the same ownership remaining after deducting any portion of the parcel or aggregate of parcels with one or more of the following characteristics:

a. Elevation within the 100-Year Floodplain, as identified on the Federal Emergency Management Agency Flood Insurance Rate Maps;
b. The area within an underlying Water Resource Overlay District governed by Section 17.49 that has been delineated by a Water Resource determination and decision;
c. Steep slopes exceeding 35%. Applicant may make a request for the Community Development Director to determine whether to make further adjustments for slopes equal to or above 25% per Section 17.44.060.H.
d. Open space
e. Public facilities and rights-of way
f. Upon approval of the Community Development Director, any lands where development of structures requiring a building permit is prohibited due to an easement and is similar in nature to items a-e.

17.04.815 New Construction

"New construction" means structure for which the "start of construction" commenced on or after the effective date of the ordinance codified in this title.

For the purposes of Chapter 17.40, new construction means an additional new building or structure separate from the existing building mass that is larger than 200 square feet on all properties located within a Historic Overlay District. Any building addition that is 30 percent or more in area (be it individual or cumulative) of the original structure shall be considered new construction.

17.04.820 New Manufactured Home Park or Subdivision

"New manufactured home park or subdivision" means a manufactured home park subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of the ordinance codified in this chapter.

17.04.825 Nonconforming Use

"Nonconforming use" means a use which lawfully occupied a building or land at the time this title or subsequent amendments became effective and which does not conform with the use regulations of the district in which it is located.

17.04.830 Non-Final Decision

"Non-final decision" means any decision by the Community Development Director or Planning Commission which is not a final decision but is appealable to another decision maker within the City.

17.04.835 Noxious Vegetation

"Noxious Vegetation" is the removal or control of noxious vegetation as that term is defined in SRC 50.705.

17.04.840 Nursery, Day or Child Care Center

"Nursery, day or child care center" means a commercial enterprise where more than five children are cared for during the day, including a kindergarten.

17.04.845 Office

"Office" means a place where a particular kind of business is transacted or a service is supplied.

17.04.850 One-Hundred-Twenty-Day Period

"One-hundred-twenty-day period" means the one-hundred-twenty-day period within which ORS 227.178 requires the city to take final action on a complete application.

17.04.855 Open Space

"Open space" means land that is undeveloped and that is planned to remain so indefinitely. The term encompasses parks, forests and farmland. It may also refer only to land zoned as being available to the public, including playgrounds, watershed preserves and schools.

17.04.860 Ordinary Mean High Water Line

"Ordinary mean high water line" means, as defined in OAR 141-82-005, the line on the bank or shore to which water ordinarily rises in season; synonymous with mean high water (ORS 274.005).

17.04.865 Ordinary Mean Low Water Line

"Ordinary mean low water line" means, as defined in OAR 141-82-005, the line on the bank or shore to which water ordinarily recedes in season; synonymous with mean low water (ORS 274.005).

17.04.870 Owner or Property Owner

"Owner or property owner" means the person who is the legal record owner of the land, or where there is a recorded land sale contract, the purchaser thereunder.

17.04.875 Overlay District

"Overlay district" means a special zoning district, the restrictions and conditions of which shall be in addition to such restrictions and conditions as may be imposed in the underlying zone.

17.04.880 Parcel

"Parcel" and "legal parcel" mean a single unit of land created by a partition or subdivision which, at the time of creation, complied with all procedural and substantive requirements of any applicable local, state or federal law.

17.04.885 Parking Area, Public

"Public parking area" means an open off-street area used for the temporary parking of more than three automobiles and available for public use, with or without charge or as an accommodation for clients or customers.

17.04.890 Parking Lot

"Parking lot" means off-street parking spaces.

17.04.895 Parking Space

"Parking space" means an unobstructed off-street area having an all-weather surface for the temporary parking or storage of one automobile.

17.04.900 Partition / Partition Land

"Partition or to "partition land" means to divide an area or tract of land into two or three parcels within a calendar year when such area or tract of land exists as a unit or contiguous units of land under single ownership at the beginning of such year. Partition land does not include:

1. A division of land resulting from a lien foreclosure, foreclosure of a recorded contract for the sale of real property or the creation of cemetery lots;
2. An adjustment of a property line by the relocation of a common boundary where an additional unit of land is not created and where the existing unit of land reduced in size by the adjustment complies with any applicable zoning ordinance;
3. The division of land resulting from the recording of a subdivision 4. A sale or grant by a person to a public agency or public body for state highway, county road, city street or other right-of-way purposes provided that such road or right-of-way complies with the Oregon City comprehensive plan, applicable state statutes, and does not create additional parcels.

17.04.905 Partition Plat

"Partition plat" means and includes a final map and other writing containing all the descriptions, locations, specifications, provisions and information concerning a partition.

17.04.907 Pedestrian Scale Lighting

Lighting fixtures that are dimensionally smaller than those intended to accommodate automobile traffic flow and buffering and which are intended to provide adequate

illumination of areas used by pedestrians or bicyclists for security, recreational or commercial purposes. In general pedestrian scale lighting is no higher than twelve (12) feet tall.

17.04.910 Pedestrian Walkway

"Pedestrian walkway" means a hard surfaced facility for pedestrians within a development or between developments, distinct from surfaces used for motor vehicles. A pedestrian walkway is distinguished from a sidewalk by its location on private property outside the public right-of-way and from a pedestrian/ bicycle accessway by the function it serves.

17.04.915 Perimeter Parking Lot Landscaping

"Perimeter parking lot landscaping" means the five-foot wide landscaped planter strip located on the perimeter of all parking lots located adjacent to the right-of-way and/or adjoining properties. Parking lots are defined as the surfaced area used for on-site automobile parking and maneuvering

17.04.920 Permit

"Permit" means any form of quasi-judicial approval relating to the use of land rendered by the city under Title 16 or Title 17 of this code, including subdivisions, partitions, lot line adjustments and abandonments, zone changes, plan amendments, conditional use permits, land use and limited land use decisions, and expedited land divisions. Permit does not include any city decision relating to system development charges under Chapter 3.20.

17.04.923 Pervious

"Pervious" refers to any material or surface that permits full or partial absorption of storm water into previously unimproved land.

17.04.925 Planning Division

"Planning division" means the planning division of the city.

17.04.930 Planter (or Planting) Strip

"Planter (or Planting) Strip" means an area for landscaping and street trees within the public street right-of-way, usually located between the curb and sidewalk. Also known as a parking strip or tree lawn.

17.04.935 Plat

"Plat" means a map of the lots in a proposed partition or subdivision, drawn to scale and which includes all of the information required by the applicable provisions of Title 16 and Title 17.

17.04.937 Pollutant

"Pollutant" means the presence in the outdoor atmosphere, ground, or water of any substances, contaminants, noise, or man-made or maninduced alteration of the chemical, physical, biological, or radiological integrity of air or water, in quantities or at levels which are or may be potentially

harmful or injurious to human health or welfare, animal, or plant life, or property, or unreasonably interfere with the enjoyment of life or property.

17.04.940 Porch

"Porch" means a roofed open unenclosed area, which may be screened, attached to or part of and with direct access to or from a building.

17.04.945 Practicable

"Practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose.

17.04.950 Preliminary Plan or Plat

"Preliminary plan" or "plat" mean a preliminary subdivision plat or partition plat as appropriate.

17.04.955 Principle Dwelling Unit

"Principle Dwelling Unit" means the primary residence for a particular lot.

17.04.960 Private Street

"Private street" means a privately owned and maintained street or accessway. The creation of private streets shall include emergency access and utility easements and reciprocal easements for all properties intended to use the accessway. Private streets shall be designed and constructed to the standards required by the city, but those standards may be different than would apply to public streets.

17.04.965 Property Line

"Property line" means the division or boundary between two legal lots or parcels.

17.04.970 Protected Water Features

"Protected water features" shall include:

1. Title 3 wetlands;
2. Rivers and perennial and intermittent streams;
3. Springs which feed stream and wetlands and have year-round flow; and
4. Natural lakes.

17.04.973 Public garage.

"Public garage" means any automobile repairs and servicing when enclosed within the building.

17.04.975 Public Recycle Drop/Receiving Center

"Public recycle drop/receiving center" means a facility that receives and temporarily stores separated recyclable waste materials including glass, scrap paper, corrugated paper, newspaper, tin cans, aluminum, plastic and oil. Maximum storage for each type of separated recyclable waste shall not exceed six hundred cubic feet. Oil storage shall not

exceed six hundred gallons. Preparation of separated materials shall be limited to nonmechanical methods such as baling and glass breaking.

17.04.980 Public Recycle Warehouse

"Public recycle warehouse" means a facility that receives and stores and prepares for transport separated recyclable waste material including glass, scrap paper, corrugated paper, newspaper, tin cans, aluminum, plastic and oil. Preparation of separated materials, including baling, compacting and glass breaking, may be part of this facility.

17.04.985 Public Utilities and Services

"Public utilities and services" means facilities for providing electric power, communication, water, sewers and transportation.

17.04.990 Quasi-Judicial

"Quasi-judicial" means any final decision of the city that applies the provisions of city code Titles 16 or 17, in response to an application, that pertains to a specific property or small set of properties and which is legally required to result in a decision by the city.

17.04.995 Radio Frequency (RF) Energy

"Radio Frequency (RF) Energy" means the energy used by cellular telephones, telecommunications facilities, and other wireless communications devices to transmit and receive voice, video, and other data information.

17.04.1000 Rear Lot Line

"Rear lot line" means a lot line that is opposite to and more distant from the front lot line. In the case of a corner lot, the Community Development Director shall determine the rear lot line. In the case of an irregular or triangular shaped lot, an imaginary lot line ten feet in length shall be drawn within the lot parallel to and at the maximum distance from the front lot line. A lot line abutting an alley is a rear lot line.

17.04.1005 Record

"Record" means the public record compiled for each quasi-judicial and legislative action and includes the written minutes of all public hearings, audio tape recordings, if any, of the public meetings, the application and all materials duly submitted by the applicant, all documents, evidence, letters and other materials duly submitted by any party to the decision-making proceeding, staff reports, public notices, and all decisions rendered by city decision-makers.

17.04.1010 Recreational Vehicle

"Recreational vehicle" means a vehicle which is:
1. Built on a single chassis;
2. Four hundred square feet or less when measured at the largest horizontal projection;
3. Designed to be self-propelled or permanently towable by a light duty truck; and
4. Designed primarily as temporary quarters for recreational, camping, travel or seasonal use and not for use as a dwelling.

17.04.1015 Religious Institution

A church or place of worship or religious assembly with related facilities such as the following in any combination: rectory or covent, private school, meeting hall, offices for administration of the institution, licensed child or adult daycare, playground or cemetery.

17.04.1020 Reserve Strip

"Reserve strip" means a parcel of land, usually one foot in width, running the length of a half-street parallel to the center line or running across the end of a street at right angles to the center line which, when deeded to the city, prevents the abutting property owner from using the street for access to the abutting property without first making the appropriate dedication from his/her land.

17.04.1025 Residential Facility

"Residential facility" means a residential care, residential training or residential treatment facility licensed or registered by or under the authority of the department, as defined in ORS 443.400, under ORS 443.400 to 443.460 or licensed by the State Office for Services to Children and Families under ORS 418.205 to 418.327 which provides residential care alone or in conjunction with treatment or training or a combination thereof for six to fifteen individuals who need not be related. Staff persons required to meet licensing requirements shall not be counted in the number of facility residents, and need not be related to each other or to any resident of the residential facility.

17.04.1030 Residential Home

"Residential home" means a residential treatment or training or an adult foster home licensed by or under the authority of the department, as defined in ORS 443.400, under ORS 443.400 to 443.825, a residential facility registered under ORS 443.480 to 443.500 or an adult foster home licensed under ORS 443.705 to 443.825 which provides residential care alone or in conjunction with treatment or training or a combination thereof for five or fewer individuals who need not be related. Staff persons required to meet licensing requirements shall not be counted in the number of facility residents, and need not be related to each other or to any resident of the residential home.

17.04.1035 Residential Zone

"Residential zone" shall include any of the following zoning districts: R-10 single-family dwelling district, R-8 single-family dwelling district, R-6 single-family dwelling district, R-5 dwelling district, R-3.5 Dwelling District and R-2 Dwelling District.

17.04.1040 Resource versus Facility

"Resource" versus "Facility" means the distinction being made is between a "resource," a functioning natural system such as a wetland or stream; and a "facility" which refers to a created or constructed structure or drainage way that is designed, constructed and maintained to collect and filter, retain, or detain surface water runoff during and after a storm event for the purpose of water quality improvement.

17.04.1045 Restoration

"Restoration" for the purposes of Chapter 17.49 means the process of returning a disturbed or altered area or feature to a previously existing natural condition. Restoration activities reestablish the structure, function and/or diversity to that which occurred prior to impacts caused by human

activity. Also see "revegetation" and "mitigation".

17.04.1047 Restrictive Covenant

"Restrictive Covenant" means a restriction on the use of a lot or parcel of land that is set forth in the deed and recorded with the county recorder. It is binding on subsequent owners and may be used to enforce the preservation of trees, wetlands or other natural resources on the property. Also known as "Deed Restriction".

17.04.1048 Revegetation

"Revegetation" means the re-establishment of vegetation on previously disturbed land, for the purpose of restoration and mitigation measures for a disturbed natural area or buffer zone. See also "Restoration"

17.04.1050 17.04.570 Retail Store

"Retail store" means a business establishment where goods are sold in small quantities to the ultimate consumer.

17.04.1055 Right-of-Way

"Right-of-way" means the area between boundary lines of a street, alley or other public accessway.

17.04.1060 Riparian

"Riparian" means those areas associated with streams, lakes and wetlands where vegetation communities are predominately influenced by their association with water.

17.04.1065 Routine Repair and Maintenance

"Routine repair and maintenance" means activities directed at preserving an existing allowed use or facility, without expanding the development footprint or site use.

17.04.1070 School, Commercial

"Commercial school" means a building where instruction is given to pupils in arts, crafts or trades, and operated as a commercial enterprise as distinguished from schools endowed and/or supported by taxation.

17.04.1075 School, Primary, Elementary, Junior High or High

"School, primary, elementary, junior high or high" shall include public or private schools, but not nursery school, kindergarten or day care centers, except when operated in conjunction with a school.

17.04.1080 School, Private

"Private school" means a school not supported by taxes.

17.04.1085 School, Public

"Public school" means a free tax-supported school controlled by a local governmental authority.

17.04.1090 Screening

"Screening" means for the purposes of Chapter 17.80 means to effectively obscure to a minimum height of 6 feet the view of the base of a wireless communication facility.

17.04.1093 Security Lighting

Lighting intended to reduce the risk of personal attack, discourage intruders, vandals, or burglars, and to facilitate active surveillance of an area by designated surveillance personnel or by remote camera.

17.04.1095 Sediment

"Sediment" means any soil, sand, dirt, dust, mud, rock, gravel, refuse or any other organic or inorganic material that is in suspension, is transported, has been moved or is likely to be moved by erosion. Sedimentation is theprocess by which sediment is removed from its site of origin by soil erosion, suspension in water, and/or wind or water transport.

17.04.1100 Self-Supporting

"Self-Supporting" means the independent support of itself or its own weight.17.04.1105 Service Station

17.04.1105 Service Station

"Service station" means an establishment where bulk sales, fuels, oils or accessories for motor vehicles are dispensed, sold or offered for retail sale and where minor motor vehicle repair service is available.

17.04.1110 Setback

"Setback" means the minimum distance by which the footprint of all buildings or structures shall be separated from a lot line.

17.04. 1115 Shade

"Shade" means a shadow cast by the shade point of a structure or vegetation when the sun is at an altitude of 21.3 degrees and an azimuth ranging from 22.7 degrees east and west of true south.

17.04.1120 Sidewalk, Curb-Tight (aka Attached Sidewalk)

"Curb-tight or Attached Sidewalk" refers to a sidewalk that is attached and not separated from the curb and gutter of a street by a planter strip, tree lawn or other landscaping.

17.04.1125 Sidewalk, Setback (aka Detached Sidewalk)

"Setback or Detached Sidewalk" refers to a sidewalk that is separated from the curb and gutter of a street by a planter strip, tree lawn or other landscaping. Setback sidewalks may be placed fully or partially within easements on private property.

17.04.1130 Significant Negative Impact

"Significant negative impact" for the purpose of Chapter 17.49 means an impact that affects the natural environment, considered individually or cumulatively with other impacts on the water quality resource area, to the point where existing water quality functions and values are degraded.

17.04.1135 Single-Family Detached Residential Units

"Single-family detached residential units" means one dwelling unit per lot that is freestanding and structurally separate from other dwelling units or buildings.

17.04.1140 Single-Family Attached Residential Units

"Single-family attached residential units" means two or more dwelling units attached side by side with some structural parts in common at a common property line and located on separate and individual lots.

17.04.1145 Slope

"Slope" is an inclined earth surface, the inclination of which is expressed denoting a given rise in elevation over a given run in distance. A forty percent slope, for example, refers to a forty-foot rise in elevation over a distance of one hundred feet. A one hundred percent slope equals a forty-five degree angle. Slopes are measured across a horizontal rise and run calculation within any horizontal twenty-five foot distance. "Slope" shall be calculated as follows:

1) For lots or parcels individually or cumulatively greater than ten thousand square feet in size, between grade breaks, obtain the vertical distance, divide by the horizontal distance and multiply by one hundred. The horizontal distance to be used in determining the location of grade breaks shall be fifty feet;
2) For lots or parcels ten thousand square feet or smaller in size, obtain the vertical distance across the lot or parcel, divide by the horizontal distance and multiply by one hundred;

The resulting number is the slope expressed as a percentage.

17.04.1150 Solid Waste Processing Facility

"Solid waste processing facility" means a place or piece of equipment whereby mixed solid waste is altered in form, condition or content by methods or systems such as, but not limited to, shredding, milling or pulverizing.

17.04.1155 Solid Waste Transfer Facility

"Solid waste transfer facility" means a waste collection and disposal system between the point of collection and a processing facility or a disposal site.

17.04.1160 South or South Facing

"South" or "south facing" means true south, or twenty degrees east of magnetic south.

17.04.1165 Stable, Private

"Private Stable" means a detached accessory building for the keeping of horses owned by occupants of the premises and which are not kept for remuneration or profit.

17.04.1170 Start of Construction

"Start of construction" is meant to include substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, placement or other improvement was within one hundred eighty days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or shed not occupied as dwelling units or not a part of the main structure.

17.04.1175 Steep Slopes

"Steep slopes" means those slopes that are equal to or greater than twenty-five percent. Steep slopes have been removed from the "buildable lands" inventory and have not been used in calculations to determine the number of acres within the urban growth boundary which are available for development.

17.04.1180 Stormwater

"Stormwater" means the surface water runoff that results from all natural forms of precipitation.

17.04.1183 Stormwater Pre-Treatment Facility

"Stormwater pre-treatment facility" means any structure or drainage way that is designed, constructed, and maintained to collect and filter, retain, or detain surface water run-off during and after a storm event for the purpose of water quality improvement.

17.04.1185 Stormwater Quantity Control and Quality Control Facilities

"Stormwater quantity control and quality control facility" means a component of a manmade drainage feature, or features designed or constructed to perform a particular function or multiple functions, including, but not limited to, pipes, swales, ditches, culvert, street gutters, detention basins, retention basins, wet ponds, constructed wetlands, infiltration devices, catch basins, oil/water separators, and sediment basins. Stormwater facilities shall not include building gutters, downspouts and drains serving one single-family residence.

17.04.1190 Stormwater Pretreatment Facility

"Stormwater pretreatment facility" means any structure or drainage way that is designed, constructed and maintained to collect and filter, retain or detain surface water runoff during and after a storm event for the purpose of water quality improvement.

17.04.1195 17.04.660 Story

"Story" means that part of a building between the surface of any floor and the surface of the floor next above it or if there be no floor above it, then the space between the floor and the ceiling next above it.

17.04.1200 Story, Half

"Half story" means a story under a gable, hip, or gambrel roof of which the wall are not standard height.

17.04.1205 Stream

"Stream" meansareas where surface water produces a defined channel or bed, including bedrock channels, gravel beds, sand and silt beds, and defined-channel swales. The channel or bed does not have to contain water year-round. This definition is not meant to include irrigation ditches, canals, storm or surface water runoff structures, or other artificial watercourses unless they are used to convey streams naturally occurring prior to construction of such watercourses. Streams are categorized into two classes: perennial streams and intermittent streams. Perennial stream means a stream that flows year-round during years of normal precipitation. Intermittent stream means a stream that flows only part of the year, or seasonally, during years of normal precipitation.

17.04.1210 Street or Road

"Street or road" means a public or private way that is created to provide the principal means of ingress or egress for persons to one or more lots, parcels, areas or tracts of land, excluding a private way that is created to provide ingress and egress to such land in conjunction with the use of such land for forestry, mining or agricultural purposes.

17.04.1215 Structure

"Structure" means anything constructed or erected that requires location on the ground or attached to something having location on the ground.

For Chapter 17.42 "structure" means a walled and roofed building including a gas or liquid storage tank that is principally aboveground.

17.04.1220 Structural Alterations

"Structural alterations" means any change in the supporting members of a building such as bearing walls, columns, beams or girders.

17.04.1225 Subdivide Land

"Subdivide land" means to divide an area or tract of land into four or more lots within a calendar year when such area or tract of land exists as a unit or contiguous units of land under a single ownership at the beginning of such year. - Subdivide land does not include:

1. A division of land resulting from a lien foreclosure, foreclosure of a recorded contract for the sale of real property or the creation of cemetery lots;
2. An adjustment of a property line by the relocation of a common boundary where an additional unit of land is not created and where the existing unit of land reduced in size by the adjustment complies with any applicable zoning ordinance;
3. The division of land resulting from the recording of a partition;

4. A sale or grant by a person to a public agency or public body for state highway, county road, city street or other right-of-way purposes provided that such road or right-of-way complies with the Oregon City comprehensive plan, applicable state statutes, and does not create additional parcels.

17.04.1230 Subdivide

"Subdivide" means to divide an area or tract of land into four or more lots within a calendar year when such area or tract of land exists as a unit or contiguous units of land under a single ownership at the beginning of such year.

17.04.1235 Subdivider

"Subdivider" means any person who undertakes the subdividing of a parcel of land, including changes in street or lot lines, for the purpose of transfer of ownership or development.

17.04.1240 Subdivision

"Subdivision" means an act of subdividing land.

17.04.1245 Subdivision Plat

"Subdivision plat" means and includes a final map or other writing containing all the descriptions, locations, specifications, dedications, provisions and information concerning a subdivision.

17.04.1250 Subject Property

"Subject property" means the land that is the subject of a permit application.

17.04.1255 Substantial Damage

"Substantial damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed fifty percent of the assessed value of the structure before the damage occurred.

17.04.1260 Substantial Improvement

"Substantial improvement" for the purpose of Chapter 17.40 means any repair, reconstruction or improvement of a structure, the cost of which equals or exceeds fifty percent of the market value of the structure either:

1. Before the improvement or repair is started; or
2. If the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

   The term does not, however, include either:

   1. Any project for improvement of a structure to correct existing violations of state or local health, sanitary or safety code specifications which has been identified by the local code enforcement official and that is the minimum necessary to assure safe living conditions; or

2. Any alteration of a "historic structure," provided that the alteration will not preclude the structure's continued designation as a "historic structure."

17.04.1265 Support Structure

"Support Structure" means an existing building or other structure to which an antenna is or will be attached, including, but not limited to, buildings, steeples, water towers, and billboard signs. Support structures do not include support towers, buildings or structures used for residential purposes, utility poles, light standards, or light poles.

17.04.1270 Support Tower

"Support Tower" means a structure designed and constructed exclusively to support a wireless communication facility or an antenna array, including, but not limited to, monopoles, lattice towers, guyed towers, and self-supporting towers.

17.04.1275 Temporary Wireless Communication Facility (Temporary WCF)

"Temporary Wireless Communication Facility (Temporary WCF)" means any wireless communication facility that is to be placed in use for not more than sixty (60) days, is not deployed in a permanent manner, and does not have a permanent foundation.

17.04.1280 Through Lot

"Through lot" means a lot having frontage on two streets that are not alleys.

17.04.1285 Title 3

"Title 3" means that part of the Metro urban growth management functional plan which requires local governments to comply with regional regulations. Title 3 is a part of those regional regulations. An ordinance (Ordinance No. 98-730C) adopted by the Metro Council on June 18, 1998.

17.04.1290 Title 3 Wetlands

"Title 3 "wetlands" means wetlands of metropolitan concern as shown on the Metro water quality and flood management area map and other wetlands added to city or county adopted water quality and flood management area maps consistent with the criteria in Section 17.49.090(D). Title 3 wetlands do not include artificially constructed and managed stormwater and water quality treatment facilities.

17.04.1295 Toe

"Toe" of slope means the point of curvature where the ground surface flattens from a descending slope.

17.04.1300 Top of Bank

"Top of bank" means the same as "bankfull stage."

17.04.1305 Transit Stop

"Transit stop" means any posted bus, light rail or other mass transit stop.

17.04.1310 Transit Street

"Transit street" means any street identified as an existing or planned bus or mass transit rail route as shown in the city's transportation master plan (1989 or as subsequently amended).

17.04.1315 Tree

"Tree" means a living standing woody plant having a trunk six inches in diameter or nineteen inches in circumference or more at a point four and one-half feet above mean ground level at the base of the tree.

17.04.1320 Tree, Buffer

"Buffer tree" means an evergreen or deciduous tree that has been approved as part of a buffering and or screening plan.

17.04.1325 Tree Caliper

"Tree caliper" means an ANSI (American National Standards Institute) standard for the measurement of nursery trees. For trees up to 6-inches in diameter, caliper is measured at 6 inches above the ground level. Trees that a 7 to 12 inch caliper are measured at 12 inches above the ground. For nursery stock above 12 inches in diameter, a DBH measurement is used (see Tree, Diameter at Breast Height).

17.04.1330 Tree, Clear Cutting

See Clear Cutting.

17.04.1335 Tree, Critical Root Zone

"Tree, critical root zone" means the rooting area of a tree, within the tree's dripline, which if injured or otherwise disturbed is likely to affect a tree's chance for survival.

17.04.1340 Tree, Diameter at Breast Height (DBH)

"Tree, diameter at breast height (DBH)" means a measurement of the trunk or stem diameter of a mature tree at a height 4.5 feet above the ground level at the base of the tree. Trees growing on slopes are measured at the mid-point between the up-slope and down-slope sides (see Trees, Regulated).

17.04.1345 Tree Dripline

"Tree dripline" means an imaginary lime along the ground that reflects the perimeter of the crown of a tree extended vertically to the ground. The dripline radius is typically measured at approximately one foot away from the trunk of the tree for each inch of tree diameter.

17.04.1350 Tree, Established

A public or street tree which has been properly planted and maintained in an approved location pursuant to accepted city standards, and which is not diseased, dying or hazardous.

17.04.1355 Tree, Grove/Tree Group

"Tree, grove/tree group" means a stand of more than one tree separated by no more than 20'.

17.04.1360 Tree, Hazardous

"Hazardous tree" means a tree that constitutes a hazard to life or has a significant potential to cause injury to persons or damage to property because the tree is in imminent danger of collapse, or is otherwise considered to be or likely to create a hazard. Hazardous trees may include, but are not limited to dead, diseased, broken, split, cracked, leaning, and uprooted trees. A tree harboring communicable diseases or insects of a type that could infest and cause the decline of adjacent or nearby trees may also be identified as a hazardous tree.

17.04.1365 Tree (or Grove), Heritage. (Also commonly known as a Heritage Tree or Grove.)

"Heritage Tree or Grove means a tree or group of trees that have been designated by the City as having unique importance, and subject to the Heritage Tree Regulations of Section 12.08.050. Where a grouping of two or more Heritage Trees is separated by no more than 20' on a property or properties, the term Heritage Grove may be used.

17.04.1370 Tree, Imminent Hazard

"Imminent Hazard Tree" means a hazardous tree as defined in Section 3.0010 -- all or more than 30% of which has already fallen or is estimated to fall within 72 hours into the public right of way or onto a target that cannot be protected, restricted, moved, or removed. (See also Tree, Hazard.) Determination of Imminent Hazard is made by the City of Oregon City Public Works or Emergency Personnel, a PGE forester, or a consulting arborist as defined in Section 3.0010. (See Arborist, Consulting.)

17.04.1375 Tree Lawn

See the definition of "planter strip".

17.04.1380 Tree (or Grove), Native

"Native Tree or Grove" refers to a regulated native tree or groves of trees that are found on the Oregon City Native Plant List. Significant native trees are those that contribute to the landscape character of the area and include Douglas fir, cedar, redwood, sequoia, oak, ash, birch, and maple. Significant native trees are typically suitable for retention next to streets and are not of a species that would likely create a public nuisance, hazard, or maintenance problem.

17.04.1385 Tree, Ornamental

"Ornamental Tree" means for purposes of tree removal, any tree (including shade trees) that originated as nursery stock as opposed to native trees that originated at the site prior to development.

17.04.1390 Tree, Parking Lot

"Parking Lot Tree" means a tree the location and variety of which was approved as part of a parking lot plan through the Site Plan and Design Review process.

17.04.1395 Tree, Perimeter

"Tree, perimeter" means a tree located within five feet of an adjacent property line.

17.04.1400 Tree Protection Plan

"Tree protection plan" means a detailed description of how trees intended to remain after development will be protected and maintained.

17.04.1405 Tree Pruning

"Tree pruning" means the prudent and judicious maintenance of trees through cutting out of branches, water sprouts, suckers, twigs, or branches. Major pruning entails the cutting out of branches three inches in diameter or greater. Major pruning also includes root pruning and cutting out branches and limbs constituting more than 20% of the trees foliage bearing area. Minor pruning includes removal of deadwood and pruning less than 20% of the tree's foliage bearing area.

17.04.1410 Tree, Public

"Public Tree" means a tree or trees within a public park, greenway, or other property owned by a governmental agency or dedicated to the public use. Street trees located in the public right-of-way are considered public trees.

17.04.1415 Tree, (or Grove) Regulated

"Regulated Tree or Grove" means Trees and Groves located on development properties undergoing land use review which are subject to the tree protection provisions of Chapter 17.41 of the City Zoning code. Street trees, buffer trees, and parking lot trees of any size, as well as Heritage Trees and Groves, may fall under the general category of "regulated" or protected trees.

17.04.1420 Tree Removal

"Tree Removal" means to cut down a tree or remove all or 50% or more of the crown, trunk, or root system of a tree; or to damage a tree so as to cause the tree to decline or die. "Removal" includes but is not limited to sever crown reduction (topping), damage inflicted upon a root system by application of toxic substances, operation of equipment and vehicles, storage of materials, change of natural grade due to unapproved excavation or filling, or unapproved alteration of natural physical conditions. "Removal" does not include normal and prudent trimming or pruning of trees.

17.04.1425 Tree, Street

"Street Tree" means any tree located in a public right-of-way, including streets and publicly dedicated alleys. For the purposes of this chapter, street right-of-way includes the area between the edge of pavement, edge of gravel or face of curb and the property line, depending on the circumstances.

17.04.1430 Tree, Severe Crown Reduction

"Tree, severe crown reduction" means the specific reduction in the overall size of a tree and/or the severe internodal cutting back of branches or limbs to stubs within the tree's crown to such a degree as to remove the normal tree canopy and disfigure the tree. Severe crown reduction is not a form of pruning. (Also known as Tree Topping.)

17.04.1435 Tree Topping

See Severe Crown Reduction.

17.04.1437 Tributary

"Tributary" means a stream, regardless of size or water volume, that flows into or joins another stream. The point where two tributaries meet is called a confluence.

17.04.1440 Undevelopable Area

"Undevelopable area" means an area that cannot be used practicably for a habitable structure because of natural conditions, such as severe topographic relief, water bodies, or conditions that isolate one portion of a property from another portion so that access is not practicable to the unbuildable portion; or man-made conditions, such as existing development which isolates a portion of the site and prevents its further development; setbacks or development restrictions that prohibit development of a given area of a lot by law or private agreement; or existence or absence of easements or access rights that prevent development of a given area.

17.04.1445 Use

"Use" means the purpose that land, or a building or a structure now serves or for which is occupied, maintained, arranged or designed.

17.04.1450 Utility Facilities

"Utility facilities" means buildings, structures or any constructed portion of a system which provides for the production, transmission, conveyance, delivery or furnishing of services including, but not limited to, heat, light, water, power, natural gas, sanitary sewer, stormwater, telephone and cable television. Utility facilities do not include stormwater pretreatment facilities.

17.04.1455 Utility Pole Placement/Replacement

"Utility Pole Placement/Replacement" means placement of antennas or antenna arrays on existing or replaced structures such as utility poles, light standards, and light poles for streets and parking lots.

17.04.1460 Variance

"Variance" means a grant of relief from the requirements of Title 16 or 17 of the Oregon City Municipal Code which permit construction in a manner that would otherwise be prohibited.

17.04.1465 Vegetated Corridor

"Vegetated corridor" means the area of setback between the top of bank of a protected water feature and the delineated edge of the water quality resource area as defined in Table 17.49-1 of this chapter.

17.04.1470 Visible or Measurable Erosion

"Visible or measurable erosion" includes, but is not limited to:
1. Deposits of mud, dirt, sediment or similar material exceeding one-half cubic foot in volume on public or private streets, adjacent property, or onto the storm and surface water system, either by direct deposit, dropping discharge, or as a result of the action of erosion.
2. Evidence of concentrated flows of water aver bare soils; turbid or sediment laden flows; or evidence of on-site erosion such as rivulets on bare soil slopes, where the flow of water is not filtered or captured on the site.
3. Earth slides, mudflows, earth sloughing, or other earth movement that leaves he property.

17.04.1475 Watercourse

"Watercourse" means a channel in with a flow of water occurs, either continuously or intermittently, and if the latter, with some degree of regularity. Such flow must be in a definite direction.

17.04.1480 Water Dependent

"Water dependent" means a structure for commerce or industry which cannot exist in any other location and is dependent on the water by reason of the intrinsic nature of its operations.

17.04.1485 Water Quality Resource Areas

"Water quality resource areas" means vegetated corridors and the adjacent protected water feature as established by Chapter 17.49.

17.04.1490 Watershed

"Watershed" means a geographic unit defined by the flows of rainwater or snowmelt. All land in a watershed drains to a common outlet, such as a stream, lake or wetland.

17.04.1495 Wetlands

"Wetlands" means those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support and, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands are those areas identified and delineated by a qualified wetland specialist as set forth in the 1987 Corps of Engineers Wetland Delineation Manual.

17.04.1500 Wireless Communications

"Wireless Communications" mean any personal wireless services as defined by the Federal Telecommunications Act of 1996 as amended, including but not limited to cellular, personal communications services, specialized mobile radio, enhanced specialized mobile radio, paging, similar Federal Communications Commission-licensed commercial wireless

telecommunications services, and wireless telecommunications services for public safety that currently exist or that may be developed in the future.

17.04.1505 Wireless Communications Facility (WCF)

"Wireless Communications Facility (WCF)" mean any un-staffed facility for the transmission and/or reception of radio frequency signals, which includes, but is not limited to, all auxiliary support equipment, any support tower or structure used to achieve the necessary elevation for the antenna, transmission and reception cabling and devices, and all antenna arrays.

17.04.1510 Yard

"Yard" means an open space other than a court on the same lot with a building unoccupied or unobstructed from the ground upward except for usual building projections as permitted by this title.

17.04.1515 Yard, Front

"Front yard" means a yard extending the full width of the lot, the depth of which is the minimum distance from the front lot line to the main building.

17.04.1520 Yard, Rear

"Rear yard" means a yard extending the full width of the lot, the depth of which is the minimum distance from the rear lot line to the main building.

17.04.1525 Yard, Side

"Side yard" means a yard extending from the front yard to the rear yard along the side of the main building. The width of such yard is the minimum distance from the side lot line to the main building.

17.04.1530 Yard, Side, Corner

"Corner side yard" means a yard lot located on a corner which extends from the front yard to the rear yard along the side of the main building. The width of such yard is the minimum distance from the side lot line abutting the street to the main building.

17.04.1535 Yard, Side, Interior

"Interior side yard" means a yard extending from the front yard to the rear yard along the side of the main building. The width of such yard is the minimum distance from the side lot line not abutting the street to the main building.

Oregon City Municipal Code
Chapter 17.06 Zoning District Classifications

17.06.010 General Provisions.

Except as hereinafter provided:

A. No building or structure shall be erected, structurally altered, enlarged or moved, nor shall any building, structure or land be used or designated to be used for any use other than is permitted in the district in which such building, structure or land is located, and then only after applying for and securing all permits and licenses required by law and this code.

B. No building or structure shall be erected, altered, enlarged or moved on a lot unless the building or structure and also the lot conform to the area regulations of the district in which the building or structure is located, except as provided in this title.

17.06.015 Classification of Zoning Districts.

For the purpose of this title and to carry out these regulations, the City is divided into districts, known as:

R-10 Single-Family Dwelling District
R-8 Single-Family Dwelling District
R-6 Single-Family Dwelling District
R-5 Single-family dwelling district
R-3.5 Dwelling District
R-2 Multi-Family Dwelling District
NC Neighborhood Commercial District
HC Historic Commercial District
C General Commercial District
GI General Industrial District
CI Campus Industrial District
MUC-1 Mixed Use Corridor District
MUC-2 Mixed Use Corridor District
MUE Mixed Use Employment District
MUD Mixed Use Downtown District
I Institutional District

In addition to the foregoing districts, special overlay districts shall be known as:

H Historic Overlay District
FP Floodplain Overlay District
US Geologic Hazards Overlay District
P Park Acquisition Overlay District
WRG Willamette River Greenway Overlay District
NROD Natural Resource Overlay District

(Ord. 94-1001 §1, 1994; Ord. 93-1008 §1, 1993; Ord. 92-1024 §1, 1992; prior code §11-2-2)

17.06.020 Official Zoning Map.

The foregoing districts and their boundaries are shown on a map entitled "official zoning map" on file in the office of the City Recorder. This map and all designations and information shown thereon are made a part of this title, as if the map, designation and

information were fully described herein. In addition, special maps shall indicate the overlay districts and their boundaries.

17.06.025 Boundaries of Zoning Districts.

Where uncertainty exists with respect to any of the boundaries of the districts as shown on the official zoning map, the following uses shall apply:

A. When the boundaries of the districts designated on the official zoning map are approximately streets or alleys, the certain lines of the streets and alleys shall be construed to be the boundaries of such districts.
B. Where the boundaries of the districts designated on the official zoning map are approximately lot lines, the lot lines shall be construed to be the boundaries of the districts.
C. In subdivided property, the district boundary lines of the official zoning map shall be determined by use of the scale contained on the map.
D. The locations of the zoning districts do not move with land divisions or lot line adjustments unless an associated zone change is approved.

17.06.030 Zoning of Annexed Areas.

All lands within the urban growth boundary of Oregon City have been classified according to the appropriate City land use designation as noted on the comprehensive plan map (per the City/ county urban growth management area agreement). The Planning Department shall complete a review of the final zoning classification within sixty days after annexation. The zoning classification shall reflect the City land use classification as illustrated in Table 17.06.

Table 17.06.030 CITY LAND USE CLASSIFICATIONS	
Residential Plan Classification	**City Zone**
Low-Density Residential	R-10, R-8, R-6
Medium-Density Residential	R-3.5, R-5
High-Density Residential	R-2
Commercial Plan Classification	**City Zone**
General Commercial	C
Mixed Use Downtown	MUD
Mixed Use Corridor	MUC I, MUC 2, NC, HC
Mixed Use Employment	MUE
Industrial Plan Classification	**City Zone**
Industrial	CI, GI

In those cases where only a single City zoning designation corresponds to the comprehensive plan designation and thus the rezoning decision does not require the exercise of legal or policy judgment on the part of the Community Development Director, Section 17.68 shall control. The decision in these cases shall be a ministerial decision of the Community Development Director made without notice or any opportunity for a hearing.

A. A public hearing shall be held by both the Planning Commission and City Commission in accordance with the procedures outlined in Chapter 17.68 (except for the provisions of Section 17.68.025) for those instances in which more than one zoning designation carries out a City plan classification.

17.06.035 Street and Alley Vacations.

Whenever any street, alley or public way is vacated by official action, the zoning districts adjoining the side of such public way shall automatically be extended to the side or sides to which such lands revert, to include the right-of-way thus vacated which shall henceforth be subject to all regulations of the extended district or districts. (Prior code §11-2-6)

17.06.040 Requirements Table.

To facilitate public understanding of this title, and for the better administration and convenience of use thereof, the following summary of maximum dwelling units per acre, minimum lot area per dwelling unit, maximum building height, and maximum setback regulations for the various zoning districts is set forth in the following table. For further information, please review the regulations of each individual zoning district. (Ord. 92-1024 §3, 1992; prior code §11-3-1)

OREGON CITY STANDARDS

Residential

Standard	R-10	R-8	R-6	R-5	R-3.5	R-2
Minimum Lot Size	10,000 sq. ft.*	8,000 sq. ft.*	6,000 sq. ft.*	5,000 sq. ft.*	3,500 sq. ft.*	2,000 sq. ft.*
Maximum Height	2.5 Stories (35 ft.)*	2.5 Stories (35 ft.)*	2.5 Stories (35 ft.)*	2.5 Stories (35 ft.)*	2.5 Stories (35 ft.)*	4 Stories (55 ft.)*
Maximum Building Lot Coverage	40%	40%	40%	50%	55%	NA
Minimum Front Yard Setback	20 ft.	15 ft.	10 ft.	10 ft.	5 ft.	5 ft.*
Minimum Interior Side Yard Setback	10 ft. / 8 ft.	9 ft. / 7 ft.	9 ft. / 5 ft.	7 ft. / 5 ft.	Detached – 5 ft. Attached – 7 ft.	5 ft.
Minimum Corner Side Yard Setback	15 ft.	15 ft.	15 ft.	10 ft.	10 ft.	10 ft.
Minimum Rear Yard Setback	20 ft.	20 ft.	20 ft.	20 ft.	15 ft.	*
Garage Standards Applicable	Yes*	Yes*	Yes*	Yes*	Yes*	No
Garage Setbacks	20 ft from ROW 5 ft. from alley	20 ft from ROW 5 ft. from alley	20 ft from ROW 5 ft. from alley	20 ft from ROW 5 ft. from alley	20 ft from ROW 5 ft. from alley	20 ft from ROW 5 ft. from alley

*See district description for further information

Commercial

Standard	C	MUC-1	MUC-2	NC	HC
Maximum Building Height	60 ft	3 Stories (4 ft)*	60 ft	3Stories (35 ft.)	3 Stories (35 ft.)
Minimum Building Height	--	--	2 Stories (25 ft.)	--	--
Maximum Building Lot Coverage	Building and Parking Lot – 85%	Building and Parking Lot – 80%	Building and Parking Lot – 90%	Building Footprint – 10,000 sq. ft.*	Building and Parking Lot – 80%
Maximum Front Yard Setback	5 ft.*	5 ft.*	5 ft.*	5 ft.*	5 ft.*
Maximum Interior Side Yard Setback	0*	0*	0ft.*	0 ft.*	0 ft.*
Maximum Corner Yard Setback	10 ft.*	30 ft.*	20 ft.*	30 ft.*	0-5ft.*
Maximum Rear Yard Setback	0 ft.	0 ft.	0 ft.	0 ft.	0 – 20 ft.*

*See district description for further information

Employment, Downtown and Industrial

Standard	MUE	MUD	MUD – Design District	GI	CI
Maximum Building Height	60 ft. / 85 ft.*	45 ft /75 ft.*	58 ft.	3 Stories (40 ft.)*	45 ft. / 85 ft.*
Minimum Building Height	--	2 Stories (25 ft)*	2 Stories (25 ft.)*	--	--
Maximum Lot Coverage	Building and Parking Lot – 80%	Building and Parking Lot – 90%	Building and Parking Lot – 100%	--	--
Maximum Front Yard Setback	*	20 ft.*	10 ft.*	25ft.*	*
Maximum Interior Side Yard Setback	*	0 ft.*	0 ft.*	25ft.*	*
Maximum Corner Yard Setback	*	20 ft.*	10 ft.*	25ft.*	*
Maximum Rear Yard Setback	.*	*	0/10 ft*	25ft.*	*

*See district description for further information

Oregon City Municipal Code
Chapter 17.08 R-10 Single-Family Dwelling District

17.08.010 Designated.

This residential district is designed for areas of single-family homes on lot sizes of approximately ten thousand square feet.

17.08.020 Permitted Uses.

Permitted uses in the R-10 district are:
A. Single-family detached residential units;
B. Parks, playgrounds, playfields and community or neighborhood centers;
C. Home occupations;
D. Farms, commercial or truck gardening and horticultural nurseries on a lot not less than twenty thousand square feet in area (retail sales of materials grown on site is permitted);
E. Temporary real estate offices in model homes located on and limited to sales of real estate on a single piece of platted property upon which new residential buildings are being constructed;
F. Accessory uses, buildings and dwellings;
G Family day care provider, subject to the provisions of Section 17.54.050.
H. Residential home per ORS 443.400
I. Cottage Housing

17.08.030 Conditional Uses.

The following conditional uses are permitted in this district when authorized by and in accordance with the standards contained in Chapter 17.56:
A. Golf courses, except miniature golf courses, driving ranges or similar commercial enterprises;
B. Bed and breakfast inns / boarding houses;
C. Cemeteries, crematories, mausoleums and columbariums;
D. Child care centers and nursery schools;
E Emergency service facilities (police and fire), excluding correctional facilities;
F. Residential care facility;
G. Private and/or public educational or training facilities;
H. Public utilities, including sub-stations (such as buildings, plants and other structures);
I. Religious institutions.
J. Assisted living facilities; nursing homes and group homes for over 15 patients

17.08.040 Dimensional Standards.

Dimensional standards in the R-10 district are:
A. Minimum lot areas, ten thousand square feet;
B. Minimum lot width, sixty-five feet;
C. Minimum lot depth, eighty feet;
D. Maximum building height, two and one-half stories, not to exceed thirty-five feet;
E. Minimum required setbacks:
    1. Front yard, twenty feet minimum setback,
    2. Front porch, fifteen feet minimum setback,
    3. Attached and detached garage, twenty feet minimum setback from the public right-of-way where access is taken, except for alleys. Detached garages on an alley shall be setback a minimum of five feet in residential areas.

4. Interior side yard, ten feet minimum setback for at least one side yard; eight feet minimum setback for the other side yard,
5. Corner side yard, fifteen feet minimum setback,
6. Rear yard, twenty feet minimum setback,
7. Rear porch, fifteen feet minimum setback..

F. Garage Standards: See Section 17.20 – Residential Design Standards

G. Maximum Lot Coverage: The footprint of all structures 200 square feet or greater shall cover a maximum of 40 percent of the lot area.

Oregon City Municipal Code
Chapter 17.10 - R-8 Single-Family Dwelling District

17.10.010 Designated.

This residential district is designed for single-family homes on lot sizes of approximately eight thousand square feet.

17.10.020 Permitted Uses.

Permitted uses in the R-8 district are:
A. Single-family detached residential units;
B. Parks, playgrounds, playfields and community or neighborhood centers;
C. Home occupations;
D. Farms, commercial or truck gardening and horticultural nurseries on a lot not less than twenty thousand square feet in area (retail sales of materials grown on site is permitted);
E. Temporary real estate offices in model homes located and limited to sales of real estate on a single piece of platted property upon which new residential buildings are being constructed;
F. Accessory uses, buildings and dwellings;
G. Family day care provider, subject to the provisions of Section 17.54.050.
H. Residential home per ORS 443.400
I. Cottage housing

17.10.030 Conditional Uses.

The following conditional uses are permitted in this district when authorized by and in accordance with the standards contained in Chapter 17.56:
A. Golf courses, except miniature golf courses, driving ranges or similar commercial enterprises;
B. Bed and breakfast inns / boarding houses;
C. Cemeteries, crematories, mausoleums and columbariums;
D. Child care centers and nursery schools;
E Emergency service facilities (police and fire), excluding correctional facilities;
F. Residential care facility;
G. Private and/or public educational or training facilities;
H. Public utilities, including sub-stations (such as buildings, plants and other structures);
I. Religious institutions.
J. Assisted living facilities; nursing homes and group homes for over 15 patients

17.10.040 Dimensional Standards.

Dimensional standards in the R-8 district are:
A. Minimum lot area, eight thousand square feet;
B. Minimum lot width, sixty feet;
C. Minimum lot depth, seventy-five feet;
D. Maximum building height, two and one-half stories, not to exceed thirty-five feet;
E. Minimum required setbacks:
    1. Front yard fifteen feet minimum setback,
    2. Front porch, ten feet minimum setback,
    2. Attached and detached garage, twenty feet minimum setback from the public right-of-way where access is taken, except for alleys. Detached garages on an alley shall be setback a minimum of five feet in residential areas.

3. Interior side yard, nine feet minimum setback for at least one side yard, seven feet minimum setback for the other side yard,
4. Corner side yard, fifteen feet minimum setback,
5. Rear yard, twenty feet minimum setback,
6. Rear porch, fifteen feet minimum setback.

F. Garage Standards: See Section 17.20 – Residential Design Standards.

G. Maximum Lot Coverage: The footprint of all structures 200 square feet or greater shall cover a maximum of 40 percent of the lot area.

Oregon City Municipal Code
Chapter 17.12 - R-6 Single-Family Dwelling District

17.12.010 Designated.

This residential district is designed for single-family homes on lot sizes of approximately six thousand square feet.

17.12.020 Permitted Uses.

Permitted uses in the R-6 district are:
A. Single-family detached residential units;
B. Parks, playgrounds, playfields and community or neighborhood centers;
C. Home occupations;
D. Farms, commercial or truck gardening and horticultural nurseries on a lot not less than twenty thousand square feet in area (retail sales of materials grown on site is permitted);
E. Temporary real estate offices in model homes located on and limited to sales of real estate on a single piece of platted property upon which new residential buildings are being constructed;
F. Accessory uses, buildings and dwellings;
G. Family day care provider, subject to the provisions of Section 17.54.050.
H. Residential home per ORS 443.400
I. Cottage housing

17.12.030 Conditional Uses.

The following conditional uses are permitted in this district when authorized by and in accordance with the standards contained in Chapter 17.56:
A. Golf courses, except miniature golf courses, driving ranges or similar commercial enterprises;
B. Bed and breakfast inns / boarding houses;
C. Cemeteries, crematories, mausoleums and columbariums;
D. Child care centers and nursery schools;
E Emergency service facilities (police and fire), excluding correctional facilities;
F. Residential care facility;
G. Private and/or public educational or training facilities;
H. Public utilities, including sub-stations (such as buildings, plants and other structures);
I. Religious institutions.
J. Assisted living facilities; nursing homes and group homes for over 15 patients

17.12.040 Dimensional Standards.

Dimensional standards in the R-6 district are:
A. Minimum lot areas, six thousand square feet;
B. Minimum lot width, fifty feet;
C. Minimum lot depth, seventy feet;
D. Maximum building height, two and one-half stories, not to exceed thirty-five feet;
E. Mininum required setbacks:
    1. Front yard, ten feet minimum setback,
    2. Front porch, five feet minimum setback,

2. Attached and detached garage, twenty feet minimum setback from the public right-of-way where access is taken, except for alleys. Detached garages on an alley shall be setback a minimum of five feet in residential areas.
3. Interior side yard, nine feet minimum setback for at least one side yard; five feet minimum setback for the other side yard,
4. Corner side yard, fifteen feet minimum setback,
5. Rear yard, twenty feet minimum setback,
6. Rear porch, fifteen feet minimum setback

F. Garage Standards: See Section 17.20 – Residential Design Standards.

G. Maximum Lot Coverage: The footprint of all structures 200 square feet or greater shall cover a maximum of 40 percent of the lot area.

Oregon City Municipal Code
Chapter 17.14 - R-5 Single-Family Dwelling District

17.14.010 Designated.

This residential district is designed for single-family homes on lot sizes of approximately five thousand square feet.

17.14.020 Permitted Uses.

Permitted uses in the R-5 district are:
A. Single-family detached residential units;
B. P parks, playgrounds, playfields and community or neighborhood centers;
C. Home occupations;
D. Farms, commercial or truck gardening and horticultural nurseries on a lot not less than twenty thousand square feet in area (retail sales of materials grown on site is permitted);
E. Temporary real estate offices in model homes located on and limited to sales of real estate on a single piece of platted property upon which new residential buildings are being constructed;
F. Accessory uses, buildings and dwellings;
G. Family day care provider, subject to the provisions of Section 17.54.050.
H. Residential home per ORS 443.400
I. Cottage Housing

17.14.030 Conditional Uses.

The following conditional uses are permitted in this district when authorized by and in accordance with the standards contained in Chapter 17.56:
A. Golf courses, except miniature golf courses, driving ranges or similar commercial enterprises;
B. Bed and breakfast inns / boarding houses;
C. Cemeteries, crematories, mausoleums and columbariums;
D. Child care centers and nursery schools;
E Emergency service facilities (police and fire), excluding correctional facilities;
F. Residential care facility;
G. Private and/or public educational or training facilities;
H. Public utilities, including sub-stations (such as buildings, plants and other structures);
I. Religious institutions.
J. Assisted living facilities; nursing homes and group homes for over 15 patients

17.14.040 Dimensional Standards.

Dimensional standards in the R-5 district are:
A. Minimum lot areas, five thousand square feet;
B. Minimum lot width, thirty-five feet;
C. Mimimum lot depth, seventy feet;
D. Maximum building height, two and one-half stories, not to exceed thirty-five feet;
E. Minimum required setbacks:
    1. Front yard, ten feet minimum setback,
    2. Front porch, five feet minimum setback,

3. Attached and detached garage, twenty feet minimum setback from the public right-of-way where access is taken, except for alleys. Detached garages on an alley shall be setback a minimum of five feet in residential areas.
4. Interior side yard, seven feet minimum setback for at least one side yard; five feet minimum setback for the other side yard,
5. Corner side yard, ten feet minimum setback,
6. Rear yard, twenty feet minimum setback,
7. Rear porch, fifteen feet minimum setback,

F. Garage Standards: See Section 17.21 – Residential Design Standards.

G. Maximum Building Coverage: The footprint of all structures 200 square-feet or greater shall cover a maximum of 50% of the lot area.

Oregon City Municipal Code
Chapter 17.16 – R-3.5 Dwelling District

17.16.010 Designated.

This residential district is designed for single-family attached and detached residential units and two-family dwellings on lot sizes of approximately three thousand five hundred square feet per dwelling.

17.16.020 Permitted Uses.

Uses permitted in the R-3.5 district are:

A. Two-family dwellings (duplexes);
B. Single-family detached residential units;
C. Single-family attached residential units (Row houses with no more than six dwelling units may be attached in a row);
D. Parks, playgrounds, playfields and community or neighborhood centers;
E. Home occupations;
F. Farms, commercial or truck gardening and horticultural nurseries on a lot not less than twenty thousand square feet in area (retail sales of materials grown on site is permitted);
G. Temporary real estate offices in model homes located on and limited to sales of real estate on a single piece of platted property upon which new residential buildings are being constructed;
H. Accessory uses and buildings;
I. Family day care provider, subject to the provisions of Section 17.54.050;
J. Residential home per ORS 443.400

17.16.030 Conditional Uses.

The following conditional uses are permitted in this district when authorized by and in accordance with the standards contained in Chapter 17.56:

A. Golf courses, except miniature golf courses, driving ranges or similar commercial enterprises;
B. Bed and breakfast inns / boarding houses;
C. Cemeteries, crematories, mausoleums and columbariums;
D. Child care centers and nursery schools;
E Emergency service facilities (police and fire), excluding correctional facilities;
F. Residential care facility;
G. Private and/or public educational or training facilities;
H. Public utilities, including sub-stations (such as buildings, plants and other structures);
I. Religious institutions
J. Assisted living facilities; nursing homes and group homes for over 15 patients
K. Live/work units

17.16.035- Master Plans

The following are permitted in this district when authorized by and in accordance with the standards contained in Chapter 17.65.

A. Multi-family residential units
B. Cottage Housing

17.16.040 Dimensional Standards.

Dimensional standards in the R-3.5 district are:

A. Minimum Lot Area.
   1. Residential uses, three thousand five hundred square feet per unit.
   2. Non-residential uses, zero minimum;
B. Minimum lot width, twenty-five feet;
C. Minimum lot depth, seventy feet;
D. Maximum building height, two and one-half stories, not to exceed thirty-five feet;
E. Minimum Required Setbacks.
   1.Front yard, five feet minimum setback,
   2.Front porch, zero feet minimum setback,
   2. Interior side yard,
      Detached unit, 5 feet minimum setback
      Attached unit, 7 feet minimum setback on the side that does not abut a common property line.
   3. Corner side yard, ten-foot minimum setback,
   4.Rear yard, fifteen-foot minimum setback,
   5.Rear porch, ten feet minimum setback.
   6. Attached and detached garages, twenty feet minimum setback from the public right-of-way where access it taken, except for alleys. Detached garages on an alley shall be setback a minimum of five feet.
F. Garage Standards: See Section 17.21 – Residential Design Standards.
G. Maximum Lot Coverage: The footprint of all structures 200 square feet or greater shall cover a maximum of 55 percent of the lot area.

17.16.050 Single-Family Attached Residential Units and Duplex Units.

The following standards apply to single-family dwellings, in addition to the standards in Section 17.16.040.

A. Maintenance Easement. Prior to building permit approval, the applicant shall submit a recorded mutual easement that runs along the common property line. This easement shall be 10 feet in width. A lesser width may be approved by the Community Development Director if it is found to be sufficient to guarantee rights for maintenance purposes of structure and yard.
B. Conversion of Existing Duplexes. Any conversion of an existing duplex unit into two single-family attached dwellings shall be reviewed for compliance with the requirements in Section 16 for partitions, Section 17.16 and the State of Oregon One and Two Family Dwelling Specialty Code prior to final recordation of the land division replat. (Ord. 99-1027 §4, 1999)

Oregon City Municipal Code
Chapter 17.18 – R-2 Multi-Family Dwelling District

17.18.010 Designated.

The purpose of this residential district is designed for multi-family residential units on lot sizes of approximately two thousand square feet per dwelling. (Prior code §11-3-7(part))

17.18.020 Permitted Uses.

Permitted uses in the R-2 district are:
A. Residential units, multi-family;
B. Parks, playgrounds, playfields and community or neighborhood centers;
C. Home occupations;
D. Temporary real estate offices in model homes located on and limited to sales of real estate on a single piece of platted property upon which new residential buildings are being constructed;
E. Accessory buildings;
F. Family day care provider, subject to the provisions of Section 17.54.050. (Prior code §11-3-7(A)); and
G. Management and associated offices and building necessary for the operations of a multi-family residential development.
H. Residential care facility per ORS 443.400;

17.18.030 Conditional Uses.

The following conditional uses are permitted in this district when authorized and in accordance with the standards contained in Chapter 17.56:
A. Golf courses, except miniature golf courses, driving ranges or similar commercial enterprises;
B. Bed and breakfast inns / boarding houses;
C. Cemeteries, crematories, mausoleums and columbariums;
D. Child care centers and nursery schools;
E Emergency service facilities (police and fire), excluding correctional facilities;
F. Private and/or public educational or training facilities
G. Public utilities, including sub-stations (such as buildings, plants and other structures);
H. Religious institutions;
I. Assisted living facilities; nursing homes and group homes for over 15 patients
J. Live/work units

17.18.035 Pre-Existing Industrial Use

Tax Lot 11200, located on Clackamas County Map #32E16BA has a special provision to permit the current industrial use and the existing incidental sale of the products created and associated with the current industrial use on the site. This property may only maintain and expand the current use, which are the manufacturing of aluminum boats and the fabrication of radio and satellite equipment, internet and data systems and antennas.

17.18.040 Dimensional Standards.

Dimensional standards in the R-2 district are:
A. Minimum lot area: 2,000 square feet per unit.

B. Minimum lot width, fifty feet;
C. Minimum lot depth, seventy-five feet;
D. Maximum building height, four stories, not to exceed fifty-five feet;
E. Minimum required setbacks:
   1. Front yard, five feet minimum setback (May be reduced to zero through Site Plan and Design Review)
   2. Side yard, five feet minimum setback,
   3. Corner side yard, ten feet minimum setback,
   4. Rear yard, ten feet minimum setback,
   5. Buffer Area. If a multi-family residential unit in this district abuts R-10, R-8, or R-6 use, there shall be required a landscaped yard of ten feet on the side abutting the adjacent zone in order to provide a buffer area and landscaping thereof shall be subject to site plan review. The Community Development Director may waive any of the foregoing requirements if it is found that the requirement is unnecessary on a case-by-case basis.
   6. Attached and detached garages, twenty feet minimum setback from the public right-of-way where access is taken, except for alleys. Detached gages on an alley shall be setback a minimum of five feet.
F. Design criteria: See Site Plan and Design Review requirements in Section 17.62 and 17.52

Oregon City Municipal Code
Chapter 17.20 Residential Design Standards

17.20.010 Purpose.

The Residential Design Standards are intended to:

A. Enhance Oregon City through the creation of attractively designed housing and streetscapes.
B. Ensure that there is a physical and visual connection between the living area of the residence and the street.
C. Improve public safety by providing "eyes on the street".
D. Promote community interaction by designing the public way, front yards and open spaces so that they are attractive and inviting for neighbors to interact.
E. Prevent garages from obscuring or dominating the primary facade of the house.
F. Provide guidelines for good design at reasonable costs and with multiple options to achieve the purposes of this chapter.

The Community Development Director may approve an alternative design that achieves the intent of this chapter.

17.20.015 Street Trees.

All new single or two-family dwellings or additions of 25 percent or more of the existing square footage of the home (including the living space and garage(s)) shall install a street tree along the frontage of the site, within the abutting developed right-of-way. Existing trees may be used to meet this requirement. A picture of the planted tree shall be submitted to the Planning Division prior to issuance of an occupancy. Upon approval by the Community Development Director, when a planter strip is not present, a tree may be placed within an easement on the abutting private property within 10 feet of the public right-of-way if a covenant is recorded for the property with the Clackamas County Recorders Office identifying the tree as a city street tree, subject to the standards in Chapter 12.08 of the Oregon City Municipal Code. The street tree shall be a minimum of 2-inchs in caliper and either selected from the Oregon City Street Tree List or approved by a certified arborist for the planting location.

17.20.020 Applicability.

The standards in section 17.20.030 through 17.20.050 apply to the street-facing facades of all single and two-family dwellings. Each new dwelling or addition shall comply with one of the residential design options in chapter 17.20.030 for the front façade of the home. Additions to homes existing prior to the adoption of this chapter in the concept plan area or new single-family homes outside of the Concept Plan areas may choose review under this section or OCMC 17.21- Single Family Residential Standards -Park Place Concept Plan Area.

Garages are defined as structures, or portions thereof used or designed to be used for the parking of vehicles, including carports. The garage width shall be measured based on the foremost interior garage walls. The Community Development Director may approve an alternative measurement location if the exterior façade screens a section of the garage or better accomplishes the goals of this Chapter.

17.20.030 Residential Design Options.

A dwelling with no garage or a detached garage may be permitted if 5 of the residential design elements in 17.20.040.A are included on the front façade of the structure.

B. A dwelling without a garage on the primary street-facing façade may be permitted if 5 of the residential design elements in 17.20.040.A are included on the front façade of the structure.

C. A dwelling with a front garage where the building is less than 24 feet wide may be permitted if:
   1. The garage is no more than 12 feet wide and;
      1. The garage does not extend past the furthest forward living space on the street-facing façade; and

2. 6 of the residential design elements in 17.20.040.A are included on the front façade of the structure; and
3. 1 of the following is provided:
   a. Interior living area above the garage is provided. The living area must be set back no more than 4 feet from the street-facing garage wall; or
   b. A covered balcony above the garage is provided. The covered balcony must be at least the same length as the street-facing garage wall, at least 6 feet deep and accessible from the interior living area of the dwelling unit; or
   c. The garage is rear loaded.

D. A dwelling with a garage that extends up to 50% of the length of the street-facing façade and is not closer to the street than the furthest forward living space on the street-facing façade may be permitted if:6 of the residential design elements in 17.20.040.A are included on the front façade of the structure.

E. A dwelling with a garage that extends up to 60% of the length of the street-facing-façade and is recessed 2 feet or more from the furthest forward living space on the street-facing façade may be permitted if:1. 7 of the residential design elements in 17.20.040.A are included on the front façade of the structure.

F. A dwelling with a garage that extends up to 60% of the length of the street-facing façade may extend up to 4 feet in front of the furthest forward living space on the street-facing façade may be permitted if:1. 8 of the residential design elements in 17.20.040.A are included on the front façade of the structure; and2. 1 of the options in 17.20.040.B is provided on the front façade of the structure.

G. A dwelling with a garage that extends up to 50% of the length of the street-facing façade may extend up to 8 feet in front of the furthest forward living space on the street-facing façade if:1. 9 of the residential design elements in 17.20.040.A are included on the front of the structure; and 2. 1 of the options in 17.20.040.B is provided on the front façade of the structure.

H. A dwelling with a garage that is side-orientated to the front lot line and may extend up to 32 feet in front of the furthest forward living space on the street-facing facade if:Windows occupy a minimum of 15% of the lineal length of the street-facing wall; and 6 of the residential design elements in 17.20.040.A are included on the front façade of the structure.

17.20.035 Corner Lots.

Homes on corner lots and through lots shall comply with one of the six options in 17.20.030 for the front of the lot. The other street-facing side of the home shall include windows and doors for a minimum of 15% of the lineal length of the ground floor façade and comply with 5 additional residential design elements in 17.20.040.A.

17.20.040 Residential Design Elements.

A. The residential design elements below shall be provided as required in section 17.20.030 above.
Exemptions to the standards in Chapter 17.20.040 may be approved through a Type II Land Use decision that are in compliance with the purpose of this Chapter listed in 17.20.010.

1. The design of the dwelling includes dormers, which are projecting structures built out from a sloping roof housing a vertical window.
2. The roof design utilizes a:
   a. Gable, which is a roof sloping downward in two parts from a central ridge, so as to form a gable at each end; or
   b. Hip, which is a roof having sloping ends and sides meeting at an inclined projecting angle.
3. The building facade includes 2 or more offsets of 16-inches or greater
4. A recessed entry that is at least 2 feet behind the furthest forward living space on the ground floor, anda minimum of 8 feet wide.
5. A minimum 60 square-foot covered front porch that is at least 5 feet deep or a minimum 40 square-foot covered porch with railings that is at least 5 feet deep and elevated entirely a minimum of 18-inches
6. A bay window that extends a minimum of 12-inches outward from the main wall of a building and forming a bay or alcove in a room within;

7. Windows and main entrance doors that occupy a minimum of 15% of the lineal length of the front façade (not including the roof and excluding any windows in a garage door);
8. Windows on all elevations include a minimum of 4-inch trim (worth 2 elements);
9. Windows on all of the elevations are wood, cladded wood, or fiberglass (worth 2 elements);
10. Windows on all of the elevations are recessed a minimum of two inches from the façade (worth 2 elements);
11. A front facing balcony projects from the wall of the building and is enclosed by a railing or parapet;
11. Shakes, shingles, brick, stone or other similar decorative materials shall occupy a minimum of 60 square feet of the street façade;
12. All garage doors are a maximum 9-feet wide;
13. All garage doors wider than 9-feet are designed to resemble 2 smaller garage doors;
14. There are a minimum of two windows in each garage door;
15. A third garage door is recessed a minimum of 2 feet;
16. The garage is part of a 2-level façade that has a window (minimum 12 square feet) with window trim (minimum 4-inches);
17. There is no attached garage onsite;
18. The living space of the dwelling is within 5 feet of the front yard setback; or
19. The driveway is composed entirely of pervious pavers or porous pavement.

B. The residential design elements, 1 and 2 below, shall be provided as required in section 17.20.030 above in addition to the residential design elements required in Section 17.20.040.A above. Residential design elements utilized in Section 17.20.040.B can be additionally utilized in Section 17.20.040.A.
   1. A minimum 60 square-foot covered front porch that is at least 5 feet deep; or a minimum 40 square-foot covered porch with railings that is at least 5 feet deep and elevated entirely a minimum of 18-inches.
   2. The garage is part of a 2-level façade. The 2nd level façade shall have a window (minimum 12 square feet) with window trim (minimum 4-inches).

17.20.050 Main Entrances.

The main entrance for each structure shall:

A. Face the street; or
B. Be at an angle up to 45 degrees from the street;
C. Open onto a covered porch that is at least 60 square feet with a minimum depth of 5 feet on the front or, in the case of a corner lot, the side of the residence;

Oregon City Municipal Code
Chapter 17.21 Single Family Residential Standards -Park Place Concept Plan Area

17.21.010 Purpose.

The intent of this chapter is to ensure new development is compatible with the goals and policies of the Park Place Concept Plan area and the historic architectural styles of Oregon City. Appropriate architectural styles include: Western Farmhouse/Vernacular, Bungalow, Queen Anne Vernacular and Foursquare. The 2006 Historic Review Board's Design Guidelines for New Construction include additional architectural descriptions of historic single family structures in Oregon City.

17.21.020 Applicability.

This chapter applies to all new detached single-family and two-family homes, accessory dwelling units, and cottages located within the Park Place Concept Plan areas. Additions to homes existing prior to the adoption of this chapter in the concept plan area or new single-family homes outside of the Concept Plan areas may choose review under this section or OCMC 17.20- Residential Design Standards.

House plans that conform to the standards may be approved as a Type I Decision. House plans that require approval of an exemption shall be processed as a Type II Land Use decision at time of land division or building permit application.



Western Farmhouse/Vernacular



Bungalow (Craftsman)



Foursquare



Queen Anne Vernacular

17.21.030 Roof Design.

A. Primary roofs shall be pitched at a minimum ratio of 5/12, except for non-gabled dormers, covered porches, or secondary masses

B. Exemption: An exemption from the roof standard of (a) above may be approve by the Community Development Director if the resulting plan is consistent with the architectural style.

17.21.040 Modulation and Massing.

New homes shall have a massing and footprint that is compatible with the envisioned pedestrian friendly neighborhoods of the Concept Plan area.

A. Houses with footprints over 1200 square feet (not including porch or deck areas) shall provide for secondary massing (such as cross gabled wings or sunroom/kitchen/dining room extensions) under separate roof-lines. Each secondary mass shall not have a footprint larger than 600 square feet.

B. Exemption: An exemption from the massing standard of a) above may be approve by the Community Development Director if the resulting plan continues to provide for a pedestrian friendly design and provides sufficient architectural details to mitigate the impact of a house with a large mass on the surrounding neighborhood.

17.21.050 Porches and Entries.

A. Each house shall contain a front porch with a front door that faces the street that is a minimum of 24 inches above average grade- with skirting-and is at least 80 square feet with no dimension under 6 feet with the wider dimension parallel to the street. Porch railings are required. The front porch shall be covered.

B. Exemption: House styles that do not contain porches or require a reduction in the size of the porch or its location may request an exemption from the Community Development Director from (a) above, if another type of pronounced entryway is provided. Pronounced entrances may include a rounded front door, canopy or other articulated entrances, columns, and/or other similar features provided they are compatible with the architectural style of the house. A reduced porch may be allowed if there is sufficient architectural or topographical reason to reduce the size of the porch. All subdivisions shall have at least 75% of the housing utilize front porches as approved under section (a) above.

C. Each dwelling unit shall have a separate delineated pedestrian connection (including duplexes, cottages and ADUs) from the front door of the unit to the sidewalk a minimum width of 3 feet. The pedestrian connection shall be separate from a driveway.

17.21.60 Architectural Details.

Dwelling units shall contain architectural details. Each of the types of details listed below are worth one point unless otherwise noted. Dwelling units must achieve the equivalent of five points worth of architectural details.

A. Stonework detailing on columns or across foundation.

B. Brick or stonework covering more than 10 percent of the facade

C. Wood, cladded wood, or fiberglass windows on all four elevations of the building. *(2-points).*

D. Decorative roofline elements (choose two): roof brackets, rake board at edge of all roof and porch, eaves, roof eaves that extend at least 18 inches.

E. Decorative siding elements (choose two) barge board/ frieze boards (minimum 8 inches) under eaves, waterboard at foundation line and between floors (minimum 6 inches), corner board at all corners

F. Decorative porch elements (choose one) scrolls, brackets, or wrapped and finished porch railings and posts.
G. Decorative shingle design covering 10 percent of the façade.
H. Exemption: Other architectural detailing may be approve by the by the Community Development Director if they are constructed with quality material, have a high level of craftsmanship and are consistent with the architectural style of the dwelling.

17.21.70 Approved Siding Materials.

A. Brick.
B. Basalt stone or basalt veneer
C. Narrow horizontal wood or composite siding (5 inches wide or less); wider siding will be considered where there is a historic precedent.
D. Board and baton siding (wood or composite siding)
E. Exemption: Other materials may be approve by the Community Development Director if they are consistent with the quality of the approved siding materials and have historic precedence in Oregon City.

17.21.80 Windows.

A. All windows on all elevations must be recessed at least two inches from the facade and incorporate window trim at least four inches in width. All elevations must provide an average of one window every 15 feet of linear elevation on each floor of each elevation. If shutters are used, they shall be half of the window opening each such that the entire window opening is covered when they are closed.
B. Exemption: An exemption may be granted by the Community Development Director from the window standard of a) above if the proposed windows provide for some amount recess depth and the side elevation is consistent architecturally with the front elevation of the house in window prominence. All subdivisions shall have at least 75% of the housing meet the standards under section (a) above.

17.21.90 Garages and Accessory Structures.

A. Garages must be detached, side entry or rear entry. For side entry garages: the garage area shall not be located in front of the living area. Accessory structures shall be designed consistent with the primary residence. Consistency of design includes the use of similar roofing, siding, and trim. For the purposes of this section, detached garages may be connected by a breezeway but consequently, will be subject to the setbacks of the underlying zone.
B. Exemption: An exemption from (a) above may be granted by the Community Development Director if topographic or existing lotting patterns prevent the ability to construct a detached, rear entry or side entry garage onsite or if the applicant proposing a design that the Community Development Director believes mitigates the impact a front entry attach garage has on the pedestrian environment. The alternate attached garage design shall not project farther than the living area and shall be limited to garage door widths of 10 feet or less.

Oregon City Municipal Code
Chapter 17.24 – NC Neighborhood Commercial District

17.24.010 Designated.

The neighborhood commercial district is designed for small-scale commercial and mixed uses designed to serve a convenience need for residents in the surrounding low-density neighborhood. Land uses consist of small and moderate sized retail, service, office, multi-family residential uses or similar as defined by the Community Development Director.

17.24.020 Permitted Uses--NC.

A. Any use permitted in the Mixed Use Corridor, provided the maximum footprint for a stand alone building with a single store or multiple buildings with the same business does not exceed 10,000 square feet, unless otherwise restricted in Sections 17.24.020, 17.24.030 or 17.24.040;
B. Grocery stores, provided the maximum footprint for a stand alone building with a single store or multiple buildings with the same business does not exceed 40,000 square feet
C. Live/work units
D. Multi-family, single family attached or two family residential, when proposed along with any non-residential allowed use in the NC District in a single development application and not exceeding 50% of the total building square feet in said application.

17.24.025 Conditional Uses.

The following conditional uses are permitted when approved in accordance with the process and standards contained in Chapter 17.56.
A. Any use permitted in the Neighborhood Commercial District that has a building footprint in excess of 10,000 square feet.
B. Emergency and ambulance services;
C. Drive thru facilities.
D. Outdoor markets that do not meet the criteria of Section 17.24.020(H);
E Public utilities and services such as pump stations and sub stations;
F. Religious institutions;
G Public and or private educational or training facilities
H. Gas StationsI. Hotels and motels, commercial lodging
J. Vet clinic or pet hospital

17.24.035 Prohibited Uses.

The following uses are prohibited in the NC District:
A. Distributing, wholesaling and warehousing;
B. Outdoor sales or storage
C. Hospitals
D. Kennels
E. Motor vehicle sales and incidental service
F. Motor vehicle repair and service

G. Self-service storage facilities
H. Heavy equipment service, repair, sales, storage or rental (including but not limited to construction equipment and machinery and farming equipment)

17.24.040 Dimensional Standards.

Dimensional standards in the NC district are:

A. Maximum building height: forty feet or three stories, whichever is less.
B. Maximum building footprint: ten thousand square feet.
C. Minimum required setbacks if not abutting a residential zone: none.
D. Minimum required interior and rear yard setbacks if abutting a residential zone: ten feet plus one foot additional yard setback for every one foot of building height over thirty-five feet.
E. Maximum Allowed Setback.
    1. Front yard setback: five feet (may be extended with Site Plan and Design Review Section 17.62.055).
    2. Interior yard setback: none.
    3. Corner side yard setback abutting a street: thirty feet, provided the site plan and design review requirements of Section 17.62.055 are met.
    4. Rear yard setback: none.

Oregon City Municipal Code
Chapter 17.26 HC Historic Commercial District

17.26.010 Designated.

The Historic Commercial District is designed for limited commercial use. Allowed uses should facilitate the re-use and preservation of existing buildings and the construction of new architecturally compatible structures. Land uses are characterized by high-volume establishments such as retail, service, office, residential, lodging, recreation and meeting facilities, or a similar use as defined by the Community Development Director.

17.26.020 Permitted Uses.

A. Uses permitted in the MUC-1 Mixed Use Corridor District
B. Residential Units, single-family detached
C. Residential Units, duplex
D. Accessory uses, buildings and dwellings;

17.26.030 Conditional Uses.

The following conditional uses and their accessory uses are permitted in this district when authorized by and in accordance with the standards contained in Chapter 17.56:
A. Conditional uses listed in the MUC Mixed Use Corridor District.

17.26.035 Prohibited uses.

A, Single-family attached

17.26.040 Historic Building Preservation.

Existing historic buildings (defined as primary, secondary or compatible buildings in a National Register Historic district or are in Oregon City's inventory of Historic Buildings) shall be used for historic commercial or residential use. If, however, the owner can demonstrate to the planning commission that no economically feasible return can be gained for a particular structure, and that such structure cannot be rehabilitated to render such an economic return, the planning commission may grant an exception to the Historic Building Preservation Policy. Such an exception shall be the minimum necessary to allow for an economic return for the land, while preserving the integrity of the Historic Building Preservation Policy in other structures in the area. The planning commission may condition the grant of any such application to these ends. The members of the Historic Review Board shall be notified of the application and may request a delay in the decision or the Planning Commission, of its own volition, may delay a decision on such an application subject to consideration by the Historic Review Board as provided in Chapter 17.40.

17.26.050 Dimensional Standards.

A. Residential Unit, Single-family detached:
    1. Dimensional standards required for the R-6 Single-Family Dwelling District.
B. All other uses:
    1. Minimum Lot Area: None.
    2. Maximum building height: 35 feet or 3 stories, whichever is less.

3. Minimum required setbacks if not abutting a residential zone: None.
4. Minimum required rear yard setback if abutting a residential zone: 20 feet.
5. Minimum required side yard setbacks if abutting a single-family residential use: 5 feet.
6. Maximum front yard setback: 5 feet (May be extended with Site Plan and Design Review section 17.62.055).
7. Maximum interior side yard: None.
8. Maximum rear yard: None.
9. Minimum required landscaping (including landscaping within a parking lot): 20 percent.

Oregon City Municipal Code
Chapter 17.29 "MUC" – Mixed Use Corridor District

17.29.010 Designated.

The Mixed Use Corridor (MUC) District is designed to apply along selected sections of transportation corridors such as Molalla Avenue, 7th Street and Beavercreek Road, and along Warner-Milne Road. Land uses are characterized by high-volume establishments such as retail, service, office, multi-family residential, lodging, recreation and meeting facilities, or a similar use as defined by the Community Development Director. A mix of high-density residential, office, and small-scale retail uses are encouraged in this District. Moderate density (MUC-1) and high density (MUC-2) options are available within the MUC zoning district. The area along 7th Street is an example of MUC-1, and the area along Warner-Milne Road is an example of MUC-2.

17.29.020 Permitted Uses--MUC-1 and MUC-2.

A. Banquet, conference facilities and meeting rooms;
B. Bed and breakfast and other lodging facilities for up to ten guests per night;
C. Child care centers and/or nursery schools;
D. Indoor entertainment centers and arcades
E. Health and fitness clubs;
F. Medical and dental clinics, outpatient; infirmary services;
G. Museums, libraries and cultural facilities;
H. Offices, including finance, insurance, real estate and government;
I. Outdoor markets, such as produce stands, craft markets and farmers markets that are operated on the weekends and after six p.m. during the weekday;
J. Postal services;
K. Parks, playgrounds, play fields and community or neighborhood centers;
L. Repair shops, for radio and television, office equipment, bicycles, electronic equipment, shoes and small appliances and equipment;
N. Residential units, multi-family;
O. Restaurants, eating and drinking establishments without a drive through;
P. Services, including personal, professional, educational and financial services; laundry and dry-cleaning;
Q. Retail trade, including grocery, hardware and gift shops, bakeries, delicatessens, florists, pharmacies, specialty stores, and similar, provided the maximum footprint for a stand alone building with a single store or multiple buildings with the same business does not exceed sixty thousand square feet;
R. Seasonal sales, subject to OCMC Chapter 17.54.060
S. Assisted living facilities; nursing homes and group homes for over 15 patients
T. Studios and galleries, including dance, art, photography, music and other arts;
U. Utilities: basic and linear facilities, such as water, sewer, power, telephone, cable, electrical and natural gas lines, not including major facilities such as sewage and water treatment plants, pump stations, water tanks, telephone exchanges and cell towers.
V. Veterinary clinics or pet hospitals, pet day care.
W. Home occupations
X. Research and development activities
Y. Temporary real estate offices in model dwellings located on and limited to sales of real estate on a single piece of platted property upon which new residential buildings are being constructed;

Z. Residential care facility

17.29.030 Conditional Uses--MUC-1 and MUC-2 Zones.

The following uses are permitted in this district when authorized and in accordance with the process and standards contained in Chapter 17.56:

A. Ancillary drive-in or drive-through facilities
B. Emergency service facilities (police and fire), excluding correctional facilities;
C. Gas Stations; ;
D. Outdoor markets that do not meet the criteria of Section 17.29.020(H);
E. Public utilities and services including sub-stations (such as buildings, plants and other structures);
F. Public and/or private educational or training facilities
G. Religious institutions;
H. Retail trade, including gift shops, bakeries, delicatessens, florists, pharmacies, specialty stores and any other use permitted in the neighborhood, historic or limited commercial districts that have a footprint for a stand alone building with a single store in excess of sixty thousand square feet in the MUC-1 or MUC-2 zone;
I. Hotels and motels, commercial lodging
J. Hospitals
K. Parking structures and lots not in conjunction with a primary use
L. Passenger terminals (water, auto, bus, train)

17.29.040 Prohibited Uses in the MUC-1 and MUC-2 Zones.

The following uses are prohibited in the MUC District:

A. Distributing, wholesaling and warehousing;
B. Outdoor sales or storage
C. Correctional Facilities.
D. Heavy equipment service, repair, sales, storage or rental[2] (including but not limited to construction equipment and machinery and farming equipment)
E. Kennels
E. Motor vehicle and recreational vehicle sales and incidental service
F. Motor vehicle and recreational vehicle repair / service
G. Outdoor sales or storage,
H. Self-service storage facilities

17.29.050 Dimensional Standards--MUC-1.

A. Minimum lot areas: none.
B. Maximum building height: forty feet or three stories, whichever is less.
C. Minimum required setbacks if not abutting a residential zone: none.
D. Minimum required interior and rear yard setbacks if abutting a residential zone: twenty feet, plus one-foot additional yard setback for every one-foot of building height over thirty-five feet.
E. Maximum Allowed Setbacks.
   1. Front yard: five feet (may be extended with Site Plan and Design Review Section 17.62.055).

2. Interior side yard: none.
3. Corner side setback abutting street: thirty feet provided the Site Plan and Design Review requirements of Section 17.62.055 are met.
4. Rear yard: none.

F. Maximum lot coverage of the building and parking lot: eighty percent.
G. Minimum required landscaping (including landscaping within a parking lot): twenty percent.

17.29.060 Dimensional Standards--MUC-2.

A. Minimum lot area: none.
B. Minimum floor area ratio: 0.25.
C. Minimum building height: twenty-five feet or two stories except for accessory structures or buildings under one thousand square feet.
D. Maximum building height: sixty feet.
E. Minimum required setbacks if not abutting a residential zone: none.
F. Minimum required interior and rear yard setbacks if abutting a residential zone: twenty feet, plus one foot additional yard setback for every two feet of building height over thirty-five feet.
G. Maximum Allowed Setbacks.
1. Front yard: five feet (may be expanded with Site Plan and Design Review Section 17.62.055).
2. Interior side yard: none.
3. Corner side yard abutting street: twenty feet provided the site plan and design review requirements of Section 17.62.055 are met.
4. Rear yard: none.

H. Maximum site coverage of building and parking lot: ninety percent.
I. Minimum landscaping requirement (including parking lot): ten percent.

17.29.070 Floor Area Ratio (FAR).

Floor area ratios are a tool for regulating the intensity of development. Minimum FARs help to achieve more intensive forms of building development in areas appropriate for larger-scale buildings and higher residential densities.

A. Standards
a. The minimum floor area ratios contained in 17.29.050 and 17.29.060 apply to all non-residential and mixed-use building development, except stand-alone commercial buildings less than 10,000 square feet in floor area.
b. Required minimum FARs shall be calculated on a project-by-project basis and may include multiple contiguous blocks. In mixed-use developments, residential floor space will be included in the calculations of floor area ratio to determine conformance with minimum FARs.
c An individual phase of a project shall be permitted to develop below the required minimum floor area ratio provided the applicant demonstrates, through covenants applied to the remainder of the site or project or through other binding legal mechanism, that the required density for the project will be achieved at project build out.

Oregon City Municipal Code
Chapter 17.31 "MUE" – Mixed Use Employment District

17.31.10 Designated.

The MUE zone is designed for employment-intensive uses such as large offices and research and development complexes or similar as defined by the Community Development Director. Some commercial uses are allowed, within limits. The County offices and Willamette Falls Hospital are examples of such employment-intensive uses.

17.31.020 Permitted Uses.

Permitted uses in the MUE district are defined as:

A. Banquet, conference facilities and meeting rooms;
B. Child care centers, nursery schools;
C. Medical and dental clinics, outpatient; infirmary services;
D. Distributing, wholesaling and warehousing;
E. Health and fitness clubs,
F. Hospitals
H. Emergency service facilities (police and fire), excluding correctional facilities;
I. Industrial uses limited to the design, light manufacturing, processing, assembly, packaging, fabrication and treatment of products made from previously prepared or semi-finished materials;
J. Offices;
K. Outdoor markets, such as produce stands, craft markets and farmers markets that are operated on the weekends and after six p.m. during the weekday;
L. Postal services
M. Parks, play fields and community or neighborhood centers;
N. Research and development offices and laboratories, related to scientific, educational, electronics and communications endeavors;
O. Passenger terminals (water, auto, bus, train)
P. Utilities. Basic and linear facilities, such as water, sewer, power, telephone, cable, electrical and natural gas lines, not including major facilities such as sewage and water treatment plants, water tanks, telephone exchange and cell towers. (Ord. 03-1014, Att. B3 (part), 2003)

17.31.030 Limited Uses.

The following permitted uses, alone or in combination, shall not exceed 20% of the total gross floor area of all of the other permitted and conditional uses within the MUE development site or complex. The total gross floor area of two or more buildings may be used, even if the buildings are not all on the same parcel or owned by the same property owner, as long as they are part of the same development site, as determined by the Community Development Director.

A. Retail services, including personal, professional, educational and financial services; laundry and dry-cleaning;
B. Restaurants, eating and drinking establishments
C. Retail shops, provided the maximum footprint for a stand alone building with a single store does not exceed 60,000 square feet.
D. Public and/or Private educational or training facilities
E. Custom or specialized vehicle alterations or repair wholly within a building.

17.31.040 Conditional Uses.

The following conditional uses are permitted when authorized and in accordance with the process and standards contained in Chapter 17.56.

A. Correctional, detention and work release facilities
B. Drive-in or drive-through facilities
C. Hotels, motels and commercial lodging
D. Outdoor markets that do not meet the criteria of Section 17.31.020.M
E. Public utilities and services such as pump stations and sub stations;
F. Religious Institutions
G. Veterinary or pet hospital, dog daycare

17.31.050 Prohibited Uses.

The following uses are prohibited in the MUE district:

A. Outdoor sales or storage
B. Kennels;
C. Gas/Convenience stations
D. Motor vehicle parts stores
E. Motor vehicle sales and incidental service
F. Heavy equipment service, repair, sales, storage or rental[2] (including but not limited to construction equipment and machinery and farming equipment)
G. Recreation vehicle, travel trailer, motorcycle, truck, manufactured home, leasing, rental or storage;
H. Self-storage facilities;

17.31.060 Dimensional Standards.

A. Minimum lot areas: None
B. Minimum Floor Area Ratio: 0.25
C. Maximum building height: except as otherwise provided in subsection C (1) of this section building height shall not exceed sixty feet.
    1. In that area bounded by Leland Road, Warner Milne Road and Molalla Avenue, and located in this zoning district, the maximum building height shall not exceed eighty-five feet in height.
D. Minimum required interior and rear yard setbacks if abutting a residential zone: twenty feet, plus one-foot additional yard setback for every one-foot of building height over thirty-five feet.
E. Maximum allowed setbacks: No maximum limit provided the Site Plan and Design Review requirements of Section 17.62.055 are met. Development of a campus with an approved Master Plan in the MUE zone is exempt from Section 17.62.055.D.1 of Site Plan and Design Review. All other standards are applicable.
F. Maximum site coverage of the building and parking lot: 80%
G. Minimum landscape requirement (including the parking lot): 20%
    The design and development of the landscaping in this district shall:
    1. Enhance the appearance of the site internally and from a distance;
    2. Include street trees and street side landscaping;
    3. Provide an integrated open space and pedestrian way system within the development with appropriate connections to surrounding properties;

4. Include, as appropriate, a bikeway walkway or jogging trail;
5. Provide buffering or transitions between uses;
6. Encourage outdoor eating areas appropriate to serve all the uses within the development;
7. Encourage outdoor recreation areas appropriate to serve all the uses within the development.

17.31.070 Floor Area Ratio (FAR).

Floor area ratios are a tool for regulating the intensity of development. Minimum FARs help to achieve more intensive forms of building development in areas appropriate for larger-scale buildings and higher residential densities.

A. Standards
   a. The minimum floor area ratios contained in 17.29.050 and 17.29.060 apply to all non-residential and mixed-use building development, except stand-alone commercial buildings less than 10,000 square feet in floor area.
   b. Required minimum FARs shall be calculated on a project-by-project basis and may include multiple contiguous blocks. In mixed-use developments, residential floor space will be included in the calculations of floor area ratio to determine conformance with minimum FARs.
   c. An individual phase of a project shall be permitted to develop below the required minimum floor area ratio provided the applicant demonstrates, through covenants applied to the remainder of the site or project or through other binding legal mechanism, that the required density for the project will be achieved at project build out.

Oregon City Municipal Code
Chapter 17.32 C General Commercial District

17.32.010 Designated.

Uses in the general commercial district are designed to serve the city and the surrounding area. Land uses are characterized by a wide variety of establishments such as retail, service, office, multi-family residential, lodging, recreation and meeting facilities or a similar use as defined by the Community Development Director.

17.32.020 Permitted Uses.

A. Any use permitted in the MUE - Mixed Use Corridor zone with no maximum footprint size, unless otherwise restricted in Sections 17.24.020, 17.24.030 or 17.24.040;
B. Hotels and motels
C. Drive-in or drove through facilities
D. Passenger terminals (water, auto, bus, train)
E. Gas Stations
F. Outdoor markets that do not meet 17.29.020.H
G. Motor vehicle and recreational vehicle sales and/or incidental service
H. Motor vehicle and recreational vehicle repair and/or service
I. Custom or specialized vehicle alterations or repair wholly within a building.

17.32.030 Conditional Uses.

The following conditional uses are permitted when authorized and in accordance with the standards contained in Chapter 17.56:
A. Religious Institutions
B. Hospitals
C. Self service storage facilities
D. Public utilities, including sub-stations (such as buildings, plants and other structures);
E. Public and/or Private educational or training facilities
F. Parking structures and lots not in conjunction with a primary use
G. Emergency service facilities (police and fire), excluding correctional facilities;

17.32.040 Prohibited Uses in the General Commercial District.

The following uses are prohibited in the General Commercial District:
A. Distribution, wholesaling and warehousing
B. Outdoor sales or storage (Except secured areas for overnight parking or temporary parking of vehicles used in the business. Sales of products not located under a roof may be allowed if they are located in an area that is architecturally connected to the primary structure, is an ancillary use and is approved through the Site Plan and Design Review process. This area may not exceed 15% of the building footprint of the primary building).
C. General manufacturing or fabrication
D. Heavy equipment service, repair, sales, storage or rental (including but not limited to construction equipment and machinery and farming equipment)

17.32.050 Dimensional Standards.

A. Minimum lot area: none.
B Maximum building height: sixty feet.
C Minimum required setbacks if not abutting a residential zone: none.
D. Minimum required interior and rear yard setbacks if abutting a residential zone: twenty feet, plus one foot additional yard setback for every two feet of building height over thirty-five feet.
E. Maximum Allowed Setbacks.
    1. Front yard setback: five feet (may be expanded with Site Plan and Design Review Section 17.62.055).
    2. Interior side yard setback: none.
    3. Corner side yard setback abutting street: none
    4. Rear yard setback: none.
F Maximum site coverage of building and parking lot: eighty five percent
G. Minimum landscaping requirement (including parking lot): fifteen percent.

Oregon City Municipal Code
Chapter 17.34 "MUD" – Mixed Use Downtown District

17.34.010 Designated.

The mixed-use downtown (MUD) district is designed to apply within the traditional downtown core along Main Street and includes the "north-end" area, generally between 5th Street and Abernethy Street, and some of the area bordering McLoughlin Boulevard. Land uses are characterized by high-volume establishments constructed at the human scale such as retail, service, office, multi-family residential, lodging or similar as defined by the Community Development Director. A mix of high-density residential, office and retail uses are encouraged in this district, with retail and service uses on the ground floor and office and residential uses on the upper floors. The emphasis is on those uses that encourage pedestrian and transit use. This district includes a Downtown Design District overlay for the historic downtown area. Retail and service uses on the ground floor and office and residential uses on the upper floors are encouraged in this district. The design standards for this sub-district require a continuous storefront façade featuring streetscape amenities to enhance the active and attractive pedestrian environment.

17.34.020 Permitted Uses.

Permitted uses in the MUD district are defined as:

A. Any use permitted in the Mixed Use Corridor without a size limitation, unless otherwise restricted in Sections 17.34.020, 17.34.030 or 17.34.040;
B. Hotel and motel, commercial lodging;
C. Marinas;
D. Religious institutions,
E. Retail trade, including grocery, hardware and gift shops, bakeries, delicatessens, florists, pharmacies, specialty stores provided the maximum footprint of a free standing building with a single store does not exceed sixty thousand square feet (a free standing building over sixty thousand square feet is allowed as long as the building contains multiple stores);
F. Live/Work Units

17.34.030 Conditional Uses.

The following uses are permitted in this District when authorized and in accordance with the process and standards contained in Chapter 17.56.

A. Ancillary drive-in or drive-through facilities ;
B. Emergency services;
C. Hospitals;
D. Outdoor markets that do not meet the criteria of Section 17.34.020(L);
E. Parks, playgrounds, play fields and community or neighborhood centers;
F. Parking structures and lots not in conjunction with a primary use;
G. Retail trade, including grocery, hardware and gift shops, bakeries, delicatessens, florists, pharmacies and specialty stores in a free standing building with a single store exceeding a foot print of sixty thousand square feet;
H. Public facilities such as sewage and water treatment plants, water towers and recycling and resource recovery centers;
I. Public utilities and services such as pump stations and sub stations;
J. Distributing, wholesaling and warehousing;
K. Gas Stations
L. Public and or private educational or training facilities

M. Stadiums and arenas
N. Passenger terminals (water, auto, bus, train)
O. Recycling center and/or solid waste facility

17.34.040 Prohibited Uses.

The following uses are prohibited in the MUD district:
A. Kennels;
B. Outdoor storage and sales, not including outdoor markets allowed in Section 17.34.030;
C. Self-service storage;
D. Single-Family and two-family residential units
E. Motor vehicle and recreational vehicle repair / service
F. Motor vehicle and recreational vehicle sales and incidental service
G. Heavy equipment service, repair, sales, storage or rental[2] (including but not limited to construction equipment and machinery and farming equipment)

17.34.050 Pre-Existing Industrial Uses.

Tax lot 5400 located at Clackamas County Tax Assessors Map #22E20DD, Tax Lots 100 and 200 located on Clackamas County Tax Assessors Map #22E30DD and Tax Lot 700 located on Clackamas County Tax Assessors Map #22E29CB have special provisions for Industrial Uses. These properties may maintain and expand their Industrial Uses on existing tax lots. A change in use is allowed as long as there is no greater impact on the area than the existing use.

17.34.060 Mixed Use Downtown Dimensional Standards—for Properties Located Outside of the Downtown Design District.

A. Minimum lot area: none.
B. Minimum floor area ratio: 0.30.
C. Minimum building height: twenty-five feet or two stories except for accessory structures or buildings under one thousand square feet.
D. Maximum building height: seventy-five feet, except for the following locations where the maximum building height shall be forty-five feet:
    1. Properties between Main Street and McLoughlin Boulevard and 11th and 16th streets;
    2. Property within five hundred feet of the End of the Oregon Trail Center property; and
    3. Property within one hundred feet of single-family detached or detached units.
E. Minimum required setbacks, if not abutting a residential zone: none.
F. Minimum required interior side yard and rear yard setback if abutting a residential zone: fifteen feet, plus one additional foot in yard setback for every two feet in height over thirty-five feet.
G. Maximum Allowed Setbacks.
    1. Front yard: twenty feet provided the site plan and design review requirements of Section 17.62.055 are met.
    2. Interior side yard: no maximum.
    3. Corner side yard abutting street: twenty feet provided the site plan and design review requirements of Section 17.62.055 are met.
    4. Rear yard: no maximum.
    5. Rear yard abutting street: twenty feet provided the site plan and design review requirements of Section 17.62.055 are met.

H. Maximum site coverage including the building and parking lot: ninety percent.
I. Minimum landscape requirement (including parking lot): ten percent.

17.34.070 Mixed Use Downtown Dimensional Standards—for Properties Located Within the Downtown Design District.

A. Minimum lot area: none.
B. Minimum floor area ratio: 0.5.
C. Minimum building height: twenty-five feet or two stories except for accessory structures or buildings under one thousand square feet.
D. Maximum building height: fifty-eight feet.
E. Minimum required setbacks, if not abutting a residential zone: none.
F. Minimum required interior and rear yard setback if abutting a residential zone: twenty feet, plus one foot additional yard setback for every three feet in building height over thirty-five feet.
G. Maximum Allowed Setbacks.
   1. Front yard setback: ten feet provided the site plan and design review requirements of Section 17.62.055 are met.
   2. Interior side yard setback: no maximum.
   3. Corner side yard setbackabutting street: ten feet provided the site plan and design review requirements of Section 17.62.055 are met.
   4. Rear yard setback: no maximum.
   5. Rear yard setback abutting street: ten feet provided the site plan and design review requirements of Section 17.62.055 are met.
H. Parking Standards. The minimum number of off-street vehicular parking stalls required in Chapter 17.52 may be reduced by fifty percent.
I. Maximum site coverage of the building and parking lot: one hundred percent.
J. Minimum Landscape Requirement. Development within the Downtown Design District overlay is exempt from required landscaping standards in Section 17.62.050(A)(1). However, landscaping features or other amenities are required, which may be in the form of planters, hanging baskets and architectural features such as benches and water fountains that are supportive of the pedestrian environment. Where possible, landscaped areas are encouraged to facilitate continuity of landscape design. Street trees and parking lot trees are required and shall be provided per the standards of Chapter 12.08 and Chapter 17.52.

17.34.080 Explanation of Certain Standards.

A. Floor Area Ratio (FAR)
   1. Purpose
   Floor area ratios are a tool for regulating the intensity of development. Minimum FARs help to achieve more intensive forms of building development in areas appropriate for larger-scale buildings and higher residential densities.
   2. Standards
      a. The minimum floor area ratios contained in 17.34.060 and 17.34.070 apply to all non-residential and mixed-use building developments.
      b. Required minimum FARs shall be calculated on a project-by-project basis and may include multiple contiguous blocks. In mixed-use developments, residential floor space will be included in the calculations of floor area ratio to determine conformance with minimum FARs.
      c. An individual phase of a project shall be permitted to develop below the required minimum floor area ratio provided the applicant demonstrates, through covenants

applied to the remainder of the site or project or through other binding legal mechanism, that the required density for the project will be achieved at project build out.

B. Building Height

1. Purpose

a. The Masonic Hall is currently the tallest building in downtown Oregon City, with a height of 58 feet measured from Main Street. The maximum building height limit of 58 feet will ensure that no new building will be taller than the Masonic Hall.

b. A minimum 2-story (25') building height is established for the Downtown Design District Overlay sub-district to ensure that the traditional building scale for the downtown area is maintained.

Oregon City Municipal Code
Chapter 17.36 GI – General Industrial District

17.36.010 Designated.

The General Industrial District is designed to allow uses relating to manufacturing, processing, production, storage, fabrication and distribution of goods or similar as defined by the Community Development Director. The uses permitted in the General Industrial District are intended to protect existing Industrial and Employment Lands to improve the region's economic climate and protect the supply of sites for employment by limiting new and expanded retail commercial uses to those appropriate in type and size to serve the needs of businesses, employees, and residents of the Industrial areas.

17.36.020 Permitted Uses.

In the GI district, the following uses are permitted if enclosed within a building:
A. Manufacturing and/or fabrication
B. Distributing, wholesaling and warehousing, excluding explosives and substances which cause an undue hazard to the public health, welfare and safety;
C. Heavy equipment service, repair, sales, rental or storage (includes but is not limited to construction equipment and machinery and farming equipment);
D. Veterinary or pet hospital, kennel;
E. Necessary dwellings for caretakers and watchmen (all other residential uses are prohibited);
F. Retail sales and services, including eating establishments for employees (i.e. a café or sandwich shop), located in a single building or in multiple buildings that are part of the same development shall be limited to a maximum of twenty thousand square feet or five percent of the building square footage, whichever is less and the retail sales and services shall not occupy more than ten percent of the net developable portion of all contiguous industrial lands;
G. Emergency service facilities (police and fire), excluding correctional facilities;
H. Outdoor sales and storage
I. Recycling center and solid waste facility
J. Wrecking yards
K. Public utilities, including sub-stations (such as buildings, plants and other structures);
L. Utilities: basic and linear facilities, such as water, sewer, power, telephone, cable, electrical and natural gas lines, not including major facilities such as sewage and water treatment plants, pump stations, water tanks, telephone exchanges and cell towers.
M. Kennels
N. Storage facilities

17.36.030 Conditional Uses.

The following conditional uses are permitted in this district when authorized and in accordance with the standards contained in Chapter 17.56:
A. Any use in which more than half of the business is conducted outdoors.
B. Hospitals

17.36.040 Dimensional Standards.

Dimensional standards in the GI district are:

A. Minimum lot area, minimum not required;

B. Maximum building height, three stories, not to exceed forty feet;

C. Minimum required setbacks:

1. Front yard, ten feet minimum setback,
2. Interior side yard, no minimum setback,
3. Corner side yard, ten feet minimum setback,
4. Rear yard, ten feet minimum setback;

D. Buffer Zone. If a use in this zone abuts or faces a residential or commercial use, a yard of at least twenty-five feet shall be required on the side abutting or facing the adjacent residential use and commercial uses in order to provide a buffer area, and sight obscuring landscaping thereof shall be subject to site plan review. The Community Development Director may waive any of the foregoing requirements if he/she determines that the requirement is unnecessary in the particular case.

E. Outdoor storage within building or yard space other than required setbacks and such occupied yard space shall be enclosed by a sight-obscuring wall or fence of sturdy construction and uniform color or an evergreen hedge not less than six feet in height located outside the required yard, further provided that such wall or fence shall not be used for advertising purposes

Oregon City Municipal Code
Chapter 17.37 (CI) Campus Industrial District

17.37.010 Designated.

The campus industrial district is designed for a mix of clean, employee-intensive industries, and offices serving industrial needs. These areas provide jobs that strengthen and diversify the economy. The uses permitted on Campus Industrial Lands are intended to improve the region's economic climate and to protect the supply of sites for employment by limiting incompatible uses within Industrial and Employment Areas and promoting industrial uses, uses accessory to industrial uses, offices for industrial research and development and large corporate headquarters.

17.37.020 Permitted Uses.

The following uses may occupy up to one hundred percent of the total floor area of the development, unless otherwise described:

A. Experimental or testing laboratories;
B. Industrial uses limited to the design, light manufacturing, processing, assembly, packaging, fabrication and treatment of products made from previously prepared or semi-finished materials
C. Public and/or Private educational or training facilities
D. Corporate or government headquarters or regional offices with fifty or more employees.
E. Computer component assembly plants
F. Information and Data processing centers
G. Software and Hardware development
H. Engineering, architectural and surveying services
I. Non-commercial, educational, scientific and research organizations
J. Research and development activities
K. Industrial and professional equipment and supply stores, which may include service and repair of the same
L. Retail sales and services, including eating establishments for employees (I.E. a café or sandwich shop), located in a single building or in multiple buildings that are part of the same development shall be limited to a maximum of 20,000 square feet or 5% of the building square footage, whichever is less, and the retail sales and services shall not occupy more than 10% of the net developable portion of all contiguous Industrial Lands.
M. Financial, insurance, real estate, or other professional offices, as an accessory use to a permitted use, located in the same building as the permitted use and limited to ten percent of the total floor area of the development. Financial institutions shall primarily serve the needs of businesses and employees within the development, and drive-through features are prohibited.
N. Utilities: basic and linear facilities, such as water, sewer, power, telephone, cable, electrical and natural gas lines, not including major facilities such as sewage and water treatment plants, pump stations, water tanks, telephone exchanges and cell towers.

17.37.030 Conditional Uses.

The following conditional uses may be established in a campus industrial district subject to review and action on the specific proposal, pursuant to the criteria and review procedures in Chapters 17.50 and 17.56:

A. Distribution or warehousing
B. Any other use which, in the opinion of the Planning Commission, is of similar character of those specified in Sections 17.37.020 and 17.37.030. In addition, the proposed conditional uses:
    1. Will have minimal adverse impact on the appropriate development of primary uses on abutting properties and the surrounding area considering location, size, design and operating characteristics of the use;
    2. Will not create odor, dust, smoke, fumes, noise, glare, heat or vibrations which are incompatible with primary uses allowed in this district;
    3. Will be located on a site occupied by a primary use, or, if separate, in a structure which is compatible with the character and scale or uses allowed within the district, and on a site no larger than necessary for the use and operational requirements of the use;
    4. Will provide vehicular and pedestrian access, circulation, parking and loading areas which are compatible with similar facilities for uses on the same site or adjacent sites.

17.37.040 Dimensional Standards.

Dimensional standards in the CI district are:
A. Minimum lot area: no minimum required.
B. Maximum building height: except as otherwise provided in subsection B (1) of this section building height shall not exceed forty-five feet.
    1. In that area bounded by Leland Road, Warner Milne Road and Molalla Avenue, and located in this zoning district, the maximum building height shall not exceed eighty-five feet in height.
C. Minimum required setbacks:
    1. Front yard: twenty feet minimum setback;
    2. Interior side yard: no minimum setback;
    3. Corner side yard: twenty feet minimum setback;
    4. Rear yard: ten feet minimum setback.
D. Buffer zone: If a use in this zone abuts or faces a residential use, a yard of at least twenty-five feet shall be required on the side abutting or facing the adjacent residential or commercial zone in order to provide a buffer area, and landscaping thereof shall be subject to site plan review.
E. If the height of the building exceeds forty-five feet, as provided in subsection B (1) of this section for every additional story built above forty-five feet, an additional twenty-five foot buffer shall be provided.

17.37.050 Development Standards.

All development within the CI district is subject to the review procedures and application requirements under Chapter 17.50, and the development standards under Chapter 17.62. Multiple building developments are exempt from the setback requirements of Chapter 17.62.055. In addition, the following specific standards, requirements and objectives shall apply to all development in this district. Where requirements conflict, the more restrictive provision shall govern:
A. Landscaping. A minimum of fifteen percent of the developed site area shall be used for landscaping. The design and development of landscaping in this district shall:
    1. Enhance the appearance of the site internally and from a distance;
    2. Include street trees and street side landscaping;
    3. Provide an integrated open space and pedestrian system within the development with appropriate connections to surrounding properties;

4. Include, as appropriate, a bikeway, pedestrian walkway or jogging trail;
5. Provide buffering or transitions between uses;
6. Encourage outdoor eating areas conveniently located for use by employees;
7. Encourage outdoor recreation areas appropriate to serve all the uses within the development.

B. Parking. No parking areas or driveways, except access driveways, shall be constructed within the front setback of any building site or within the buffer areas without approved screening and landscaping.

C. Fences. Periphery fences shall not be allowed within this district. Decorative fences or walls may be used to screen service and loading areas, private patios or courts. Fences may be used to enclose playgrounds, tennis courts, or to secure sensitive areas or uses, including but not limited to, vehicle storage areas, drainage detention facilities, or to separate the development from adjacent properties not within the district. Fences shall not be located where they impede pedestrian or bicycle circulation or between site areas.

D. Signs. One ground-mounted sign may be provided for a development. Other signage shall be regulated by Title 15.

E. Outdoor Storage and Refuse/Recycling Collection Areas.
1. No materials, supplies or equipment, including company owned or operated trucks or motor vehicles, shall be stored in any area on a lot except inside a closed building, or behind a visual barrier screening such areas so that they are not visible from the neighboring properties or streets. No storage areas shall be maintained between a street and the front of the structure nearest the street;
2. All outdoor refuse/recycling collection areas shall be visibly screened so as not to be visible from streets and neighboring property. No refuse/recycling collection areas shall be maintained between a street and the front of the structure nearest the street.

Oregon City Municipal Code
Chapter 17.39 - Institutional District

17.39.10 Designated.

The purpose of this district is designed to facilitate the development of major public institutions, government facilities and parks and ensure the compatibility of these developments with surrounding areas. The I - Institutional zone is consistent with the Public/Quasi Public and Park designations on the Comprehensive Plan map.

17.39.20 Permitted Uses.

Permitted Uses in the Institutional district are:
A. Private and/or public educational or training facilities;
B. Parks, playgrounds, playfields and community or neighborhood community centers;
C. Public facilities and services including courts, libraries and general government offices and maintenance facilities.
D. Stadiums and arenas
E. Banquet, conference facilities and meeting rooms;
F. Government offices

17.39.30 Accessory Uses.

The following uses are permitted outright if they are accessory to and related to the primary institutional use:
A. Offices
B. Retail (not to exceed 20% of total gross floor area of all building)
C. Child care centers or nursery schools
D. Scientific, educational, or medical research facilities and laboratories.
E. Religious Institutions

17.39.40 Conditional Uses.

Uses requiring conditional use permit are:
A. Any uses listed under 17.39.030 that are not accessory to the primary institutional use.
B. Boarding and lodging houses, bed and breakfast inns.
C. Cemeteries, crematories, mausoleums, and columbariums;
D. Correctional facilities;
E. Helipad in conjunction with a permitted use,
F. Parking lots not in conjunction with a primary use;
G. Public utilities, including sub-stations (such as buildings, plants and other structures);
H. Fire Stations

17.39.50 Dimensional Standards.

Dimensional standards in the I district are:
A. Maximum building height: within 100 feet of any district boundary, not to exceed 35 feet; elsewhere, not to exceed 70 feet.
B. Minimum required setbacks: 25 feet from property line except when the development is adjacent to a public-right-of-way. When adjacent to a public right-of-way, the minimum

setback is 0 feet and the maximum setback is 5 feet.

17.39.60 Relationship to Master Plan.

A. A Master Plan is required for any development within the I district on a site over 10 acres in size that:
   1. Is for a new development on a vacant property;
   2. Is for the redevelopment of a property previously used an a non-institutional use; or
   3. Increases the floor area of the existing development by 10,000 square feet over existing conditions
B. Master Plan dimensional standards that are less restrictive than those of the Institutional district require adjustments. Adjustments will address the criteria of Chapter 17.65.70 and will be processed concurrently with the Master Plan application.
C. Modifications to other development standards in the code may be made as part of the Phased Master Plan adjustment process. All modifications must be in accordance with the requirements of the Master Plan adjustment process identified in Chapter 17.65.070.

Oregon City Municipal Code

Chapter 17.40 Historic Overlay District

17.40.010 Purpose.

It is declared as a matter of public policy that the protection, enhancement, perpetuation and use of improvements of special character or special historical or aesthetic interest or value is a public necessity and is required in the interest of the health, prosperity, safety and welfare of the people. The purpose of this chapter is to:

A. Effect and accomplish the protection, enhancement and perpetuation of such improvements and of districts which represent or reflect elements of the city's cultural, social, economic, political and architectural history;
B. Safeguard the city's historic, aesthetic and cultural heritage as embodied and reflected in such improvements and districts;
C. Complement any National Register Historic districts designated in the city;
D. Stabilize and improve property values in such districts;
E. Foster civic pride in the beauty and noble accomplishments of the past;
F. Protect and enhance the city's attractions to tourists and visitors and the support and stimulus to business and industry thereby provided;
G. Strengthen the economy of the city;
H. Promote the use of historic districts and landmarks for the education, pleasure, energy conservation, housing and public welfare of the city; and
I. Carry out the provisions of LCDC Goal 5.

17.40.030 Designated.

A. The historic overlay district shall apply to the following:
   1. Historic districts, upon designation in accordance with this section;
   2. Conservation districts designated in accordance with this section;
   3. Landmarks as designated by this section; and
   4. Historic corridors designated in accordance with this section.
B. The boundaries of the historic districts, the boundaries of conservation districts, historic corridors, the location of buildings and structures in conservation districts and the location of landmarks shall be designated on a special city zoning map or maps.
C. The following are designated within the historic overlay district:
   1. The Canemah Historic District; the minimum boundaries of which are those designated by the United States Department of the Interior on the National Register of Historic Places as indicated in the city comprehensive plan.
   2. The McLoughlin Conservation District; the surveyed buildings indicated by map in the comprehensive plan shall constitute the designated structures in the McLoughlin Conservation District, along with any structures designated through the Historic Review Board designation process since initial adoption of the comprehensive plan on March 13, 1980.
   3. The Oregon Trail-Barlow Road Historic Corridor: properties identified in the 1993 Barlow Road Historic Corridor inventory of the Barlow Road by Clackamas County.
   4. Designations undertaken pursuant to Section 17.40.050. The established historic overlay district shall allow for the designation of two types of districts so that areas with a high concentration of historic structures are designated historic districts and areas with a lower concentration are designated conservation districts. Also allowed is the designation of structures of historic or architectural significance not located in an historic or conservation district as landmarks.

17.40.040 Citizen involvement.

A. The planning department shall be authorized to incur expenses in holding public workshops in the historic districts and conservation districts, distribute written information, show slides and answer questions on remodeling and rehabilitation of older buildings, and to educate the public in the need to comply with state and federal laws protecting or encouraging protection of antiquities and other related matters concerning historic preservation.

B. Citizens making applications for district or landmark designations or for exterior alterations or new construction in an historic or conservation district, and historic corridor or on a landmark site may consult with and receive advice from the planning department staff concerning their applications.

17.40.050 Designation procedure--Application--Review.

A. Institution of Proceedings. The city commission, the planning commission, the historic review board, a recognized neighborhood group or any interested person may initiate the proceedings for designation of an historic or conservation district, landmark, or historic corridor as follows:

1. The city commission or the historic review board may initiate designation proceedings by sending a written proposal or application to the planning staff. Such proposal is not subject to any minimal information requirements other than a description of the boundaries of the area to be designated.
2. Any interested person or recognized neighborhood group may start designation proceedings by sending a written application to the planning staff.

B. Application Information. The planning staff may specify the information required in an application and may from time to time change the content of that information, but at all times the planning staff shall require the following information:

1. The applicant's name and address;
2. The owner's name and address, if different from the applicant;
3. A description of the boundaries of the proposed district or a description of the proposed landmark;
4. A map illustrating the boundaries of the proposed district or the location of the proposed landmark;
5. A statement explaining the following:
    a. The reasons why the proposed district or landmark should be designated,
    b. The reason why the boundaries of the proposed district are adequate and suitable for designation,
    c. The positive and negative effects, if any, which designation of the proposed district or landmark would have on the residents or other property owners of the area.

C. The planning staff shall deliver a proposal or an application for the designation to the historic review board within thirty days after the day on which a proposal or application is received. The historic review board shall review the proposal on the application and prepare a written recommendation or decision approving or rejecting the proposed designation.

D. In preparing the recommendation or decision, the historic review board shall limit its review to:

1. Whether the proposed district or landmark would serve the purpose of the historic overlay district as stated in Section 17.40.010; and
2. Conformity with the purposes of the city comprehensive plan.

E. City Commission Review of District.

1. The historic review board shall deliver a copy of its recommendation to the city commission within thirty days.
2. The city commission shall hold a public hearing pursuant to procedures contained in Chapter 17.68.
3. After the hearing, the city commission may engage in one of the following actions:

a. Refuse to designate the proposed district; or
b. Designate the proposed district by a duly enacted ordinance; or
c. Remand the matter to the historic review board for additional consideration of a specific matter or matters.

4. The city commission may limit itself to the proposed district, and as so modified, approve it. Enlargement of the proposed district shall require additional notice and public hearing. The commission may hold such hearing or hearings.
5. The approval or disapproval of the designation by the city commission shall be I n writing and shall state the reasons for approval or disapproval.
6. Amendment or Rescission. The district designation may be amended or rescinded after the board and city commission have utilized the same procedures required by this title for establishment of the designation. The board shall give priority to designation of potential districts and landmarks indicated in the city comprehensive plan.

17.40.060 Exterior Alteration and New Construction.

A. Except as provided pursuant to subsection I of this section, no person shall alter any historic site in such a manner as to affect its exterior appearance, nor shall there be any new construction in an historic district, conservation district, historic corridor, or on a landmark site, unless a certificate of appropriateness has previously been issued by the historic review board. Any building addition that is thirty percent or more in area of the historic building (be it individual or cumulative) shall be considered new construction in a district. Further, no major public improvements shall be made in the district unless approved by the board and given a certificate of appropriateness.
B. Application for such a certificate shall be made to the planning staff and shall be referred to the historic review board. The application shall be in such form and detail as the board prescribes.
C.
1. The historic review board, after notice and public hearing held pursuant to Chapter 17.50, shall approve the issuance, approve the issuance with conditions or disapprove issuance of the certificate of appropriateness.
2. The following exterior alterations to historic sites may be subject to administrative approval:
a. Work that conforms to the adopted Historic Review Board Policies.
D. For exterior alterations of historic sites in an historic district or conservation district or individual landmark, the criteria to be used by the board in reaching its decision on the certificate of appropriateness shall be:
1. The purpose of the historic overlay district as set forth in Section 17.40.010;
2. The provisions of the city comprehensive plan;
3. The economic use of the historic site and the reasonableness of the proposed alteration and their relationship to the public interest in the structure's or landmark's preservation or renovation;
4. The value and significance of the historic site;
5. The physical condition of the historic site;
6. The general compatibility of exterior design, arrangement, proportion, detail, scale, color, texture and materials proposed to be used with the historic site;
7. Pertinent aesthetic factors as designated by the board;
8. Economic, social, environmental and energy consequences; and
9. Design guidelines adopted by the historic review board.
E. For construction of new structures in an historic or conservation district, or on an historic site, the criteria to be used by the board in reaching its decision on the certificate of appropriateness shall include the following:
1. The purpose of the historic conservation district as set forth in Section 17.40.010;
2. The provisions of the city comprehensive plan;
3. The economic effect of the new proposed structure on the historic value of the district or historic site;
4. The effect of the proposed new structure on the historic value of the district or historic site;
5. The general compatibility of the exterior design, arrangement, proportion, detail, scale, color, texture and materials proposed to be used in the construction of the new building or structure
6. Economic, social, environmental and energy consequences;
7. Design guidelines adopted by the historic review board.

F. For construction of new structures in an historic corridor, the criteria to be used by the board in reaching its decision on the certificate of appropriateness shall include the following:
   1. The purpose of the historic overlay district as set forth in Section 17.40.010;
   2. The policies of the city comprehensive plan;
   3. The impact on visible evidence of the trail;
   4. The impact on archaeological evidence when there exists documented knowledge of archeological resources on the property;
   5. The visual impact of new construction within the historic corridor; and
   6. The general compatibility of the site design and location of the new construction with the historic corridor considering the standards of subsection G of this section.

G. The following standards apply to development within historic corridors:
   1. Within the Oregon Trail-Barlow Road historic corridor, a minimum of a thirty-foot wide-open visual corridor shall be maintained and shall follow the actual route of the Oregon Trail, if known. If the actual route is unknown, the open visual corridor shall connect within the open visual corridor on adjacent property.
   2. No new building or sign construction shall be permitted within required open visual corridors. Landscaping, parking, streets, driveways are permitted within required open visual corridors.

H. In rendering its decision, the board's decision shall be in writing and shall specify in detail the basis therefore.

I. Nothing in this section shall be construed to prevent the ordinary maintenance or repair of any exterior architectural features which does not involve a change in design, material or the outward appearance of such feature which the building official shall certify is required for the public safety because of its unsafe or dangerous condition.

J. The following exterior alterations may be made subject to the administrative procedures as outlined below:

   Construction of fences on historic sites.

   Exterior alterations, excluding additions, to incompatible structures in the Canemah Historic District.

   1. A notice of the proposed certificate of appropriateness shall be mailed to the following persons:
      a. The applicant;
      b. All owners of property within three hundred feet of the property which is the subject of application;
      c. A recognized neighborhood association and a citizen involvement committee representative of the neighborhood involved, if the property which is the subject of the application lies wholly or partially within the boundaries of such organization.
   2. The failure of the property owner to receive notice shall not invalidate the action if a good faith attempt was made to notify all persons entitled to personal notice.
   3. Notice shall also be given by publication in a newspaper of general circulation in the area affected.
   4. Within ten days of the issuance of notice of the proposed certificate of appropriateness, any person who has received personal notice pursuant to subdivision 1 of this subsection or who demonstrates sufficient interest in the outcome to participate in such proceedings, as determined by the historic review board, may request a public hearing before the historic review board.
   5. Within forty-five days after a request for public hearing is made, a public hearing shall be held before the historic review board following procedures as established in Chapter 17.50.
   6. The historic review board shall then deny or approve the application, either with or without conditions, following procedures as established in Chapter 17.50.
   7. In the event no request for hearing is filed, the historic review board, through its chairperson and planning staff, shall issue a certificate of appropriateness in accordance with the notice given without further hearing.
   8. The board may adopt policies for review of applications of certificates of appropriateness in the historic overlay district. Such policies shall be adopted only after notice and an opportunity to be heard is provided and shall include specific opportunity for comment by the planning staff, the planning commission, and the city commission. Such policies shall carry out the city's comprehensive plan, especially those elements relating to historic preservation. In the absence of such policies, the board shall

apply such elements directly.

17.40.65 Historic Preservation Incentives

A. Purpose. Historic preservation incentives increase the potential for historically designated properties to be used, protected, renovated, and preserved. Incentives make preservation more attractive to owners of locally designated structures because they provide flexibility and economic opportunities.
B. Eligibility for historic preservation incentives. All exterior alterations of designated structures and new construction in historic and conservation districts are eligible for historic preservation incentives if the exterior alteration or new construction has received a certificate of appropriateness from the Historic Review Board per OCMC 17.50.110(c)
C. Incentives allowed. The dimensional standards of the underlying zone as well as for accessory buildings (OCMC 17.54.100) may be adjusted to allow for compatible development if the expansion or new construction is approved through historic design review.
D. Process. The applicant must request the incentive at the time of application to the Historic Review Board.

17.40.070 Demolition and moving.

A. If an application is made for a building or moving permit to demolish or move all or part of a structure which is a landmark or which is located in a conservation district or an historic district, the building inspector shall, within seven days, transmit to the historic review board a copy of the transaction.
B. The historic review board shall hold a public hearing within forty-five days of application pursuant to the procedures in Chapter 17.50.
C. In determining the appropriateness of the demolition or moving as proposed in an application for a building or moving permit, the board shall consider the following:
    1. All plans, drawings and photographs as may be submitted by the applicant;
    2. Information presented to a public hearing held concerning the proposed work;
    3. The city comprehensive plan;
    4. The purpose of this section as set forth in Section 17.40.010;
    5. The criteria used in the original designation of the landmark or district in which the property under consideration is situated;
    6. The historical and architectural style, the general design, arrangement, materials of the structure in question or its fixtures; the relationship of such features to similar features of the other buildings within the district and the position of the building or structure in relation to public rights-of-way and to other buildings and structures in the area;
    7. The effects of the proposed work upon the protection, enhancement, perpetuation and use of the district, which cause it to possess a special character or special historical or aesthetic interest or value;
    8. Whether denial of the permit will involve substantial hardship to the applicant, and whether issuance of the permit would act to the substantial detriment of the public welfare and would be contrary to the intent and purposes of this section;
    9. The economic, social, environmental and energy consequences.
D. The failure of the applicant to provide the information required by Subsection C(1)-(9) shall be grounds for deeming the application incomplete.
E. The board may approve or deny the demolition or moving request after considering the criteria contained in Section 17.40.070(C). Action by the board approving or denying the issuance of a permit for demolition or moving may be appealed to the city commission by any aggrieved party, by filing a notice of appeal, in the same manner as provided in Section 17.50 for appeals. If no appeal of a demolition permit is filed, the building official shall issue the permit in compliance with all other codes and ordinances of the city.

F In any case where the city commission has ordered the removal or demolition of any structure determined to be dangerous to life, health or property, nothing contained in this title shall be construed as making it unlawful for any person, without prior approval of the historic review board, pursuant to this title, to comply with such order.

Oregon City Municipal Code
Chapter 17.41 Tree Protection Standards

17.41.010 Protection of Trees- Intent.

The intent of this chapter is to ensure that new development is designed in a manner that preserves trees to the maximum extent practicable. As a requirement of any Type II land use application, the siting of structures, roadways and utility easements, shall provide for the protection of tree resources to the maximum extent practicable. This applies to all subdivision, partition and site plan and design review applications.

Applicants for development shall ensure that all trees shall, whenever practicable, be preserved outside the construction area.

17.41.020 Tree Protection – Applicability.

Applications for development subject to Chapter 16.08 or 16.12 (Subdivision or Minor Partition) or Chapter 17.62 (Site Plan and Design Review) shall demonstrate compliance with these standards as part of the review proceedings for those developments. For public capital improvement projects, the City Engineer shall demonstrate compliance with these standards pursuant to a Type II process. Additionally, tree removal on slopes greater than 25% where canopy area removal exceeds 25% of the lot, unless exempted under section 17.41.030, shall be subject to these standards. A heritage tree or grove which has been designated pursuant to the procedures of Chapter 12.08.050 shall be subject to the standards of this section.

17.41.030 – Tree Protection - Conflicting Code Provisions.

Except as otherwise specified in this section, where these standards conflict with adopted City development codes or policies, the provision which provides the greater protection for regulated trees or groves, as defined in section 17.04, shall govern.

17.41.040 – Tree Protection – Exemptions.

These regulations are not intended to regulate normal cutting, pruning and maintenance of trees on private property except where trees are located on lots that are undergoing development review or are otherwise protected within the Natural Resource Overlay District (NROD) of section 17.49. Additionally, these standards are not intended to regulate farm and forest practices as those practices,

17.41.050 Tree Protection – Compliance Options.

Applicants for review shall comply with these requirements through one of the following procedures:

A. Option 1 - Mitigation. Retention and removal of trees, with subsequent mitigation by replanting pursuant to section 17.41.060 or 17.41.070; or
B. Option 2 – Dedicated Tract. Protection of trees or groves by placement in a tract within a new subdivision or partition plat pursuant to section 17.41.080, or
C. Option 3 – Restrictive Covenant. Protection of trees or groves by recordation of a permanent restrictive covenant pursuant to section 17.41.090.

A regulated tree that has been designated for protection pursuant to this section must be retained or permanently protected unless it has been determined by a certified arborist to be diseased, dying or hazardous, pursuant to the following applicable provisions.

The Community Development Director, pursuant to a Type II procedure, may allow a property owner to cut a specific number of trees within a regulated grove if preserving those trees would:

(1) Preclude achieving 80% of minimum density with reduction of lot size; or

(2) Preclude meeting minimum connectivity requirements for subdivisions.

Farm or forest resources. An applicant for development may claim that the regulated grove or trees was a designated farm or forest use, tree farm, Christmas tree plantation, or other approved timber use prior to development application. "Forest practices" and "forestlands" as used in this subsection shall have the meaning set out in ORS 30.930. "Farming practice" as used in this subsection shall have the meaning set out in ORS 30.930. "Farm use" as used in this subsection shall have the meaning set out in ORS 215.203. In this case, the applicant may propose an alternative mitigation plan to be approved by the Community Development Director.

17.41.060 - Tree Removal and Replanting - Mitigation (Option 1).

Regulated trees that are removed *outside of* the construction area, if removed shall be replanted with the number of trees specified in Column 1 of Table 17.41.060-1. Regulated trees that are removed *within* the construction area shall be replanted with the number of replacement trees required in Column 2.

Table 17.41.060-1
Tree Replacement Requirements

Size of tree removed (DBH)	Column 1 Number of trees to be planted. (If removed **Outside** of construction area)	Column 2 Number of trees to be planted. (If removed **Within** the construction area)
6 to 12"	3	1
13 to 18"	5	2
19 to 24"	8	3
25 to 30"	10	4
31 and over"	15	5

(Explanatory Figure to be Added):

Example: a site contains three 10" trees to be removed within the building area, and two 20" trees to be removed outside of the building area. The total number of replacement trees is determined as follows:

Outside Building Area: Two (2) x 20" trees and One (1) 26" tree:
(2 x 8) + (1 x 10) = 36 replacement trees required
Within Building Area: Three (3) x 10" trees:
3 x 1 = 3 replacement trees
Total Replacement Trees Required = 36 + 3 = 39 trees

The number of replacement trees required on a development site shall calculated separately from and in addition to any public or street trees in public right-of-way required under Section 12.08 – Community Forest and Street Trees. Where the Community Development Director determines it is impracticable or unsafe to preserve regulated trees, the applicant may be allowed to remove the trees so long as they are replaced in accordance with an approved landscape plan that includes new tree plantings of at least one and one-half inches (1½") in caliper measured six inches above the root crown, or equivalent size as approved by the

Community Development Director, and the plan must meet, at a minimum, the requirements of Table 17.41.060-1.

17.41.070 – Planting Area Priority for Mitigation (Option 1).

Development applications which opt for removal or trees with subsequent replanting pursuant to section 17.41.050(A) and shall be required to mitigate for tree cutting by complying with the following priority for replanting standards 1-4 below:

A. First Priority. Replanting on the development site. First priority for replacement tree locations shall be planting on site.
B. Second Priority. Off-site Replacement Tree Planting Locations. If the Community Development Director determines that it is not practicable to plant the total number of replacement trees on-site, a suitable off-site planting location for the remainder of the trees may be approved that will reasonably satisfy the objectives of this section. Such locations may include either publicly owned or private land and must be approved by the Community Development Director.
C. Third Priority. Cash-in-lieu of Planting (Tree Bank/Fund). If an appropriate off-site location cannot be found, the Community Development Director may approve the payment of cash-in-lieu into a dedicated fund for the remainder of trees that cannot be planted in the manner described above:
    1. A tree bank is hereby created which may include the following: Tree and nursery stock in an acceptable condition, to be planted and maintained in storage for future planting or transplanting. Monies paid into the tree fund shall be used exclusively for the purpose of purchase and planting of trees on public and private property in lieu of planting actual trees as determined by the Community Development Director.
    2. The cash-in-lieu payment per tree shall be as listed on the adopted fee schedule as adjusted for the Consumer Price Index (Index). The price shall include the cost of installation.
    3. The amount of the cash-in-lieu payment into the tree bank shall be calculated as the difference between the value of the total number of trees an applicant is required to plant, including cost of installation and adjusted for Consumer Price Index, minus the value of the trees actually planted.

17.41.075. Alternative Mitigation Plan.

The Community Development Director may, subject to a Type II procedure, approve an alternative mitigation plan that adequately protects habitat pursuant to the standards for the Natural Resource Overlay District alternative mitigation plan, Section 17.49.190.

17.41.080. Tree Preservation within Subdivisions and Partitions – Dedicated Tract (Option 2).

A. Applicants for new subdivision and partition plats may delineate and show the regulated trees or groves as either a separate tract or part of a larger tract that meets the requirements of subsection (D) of this section.
B. The standards for land divisions subject to this section shall apply in addition to the requirements of the City land division ordinance and zoning ordinance, provided that the minimum lot area, minimum average lot width, and minimum average lot depth standards of the base zone may be superseded in order to allow for a transfer of density pursuant to Section 17.41.090 below.
C. Prior to preliminary plat approval, the regulated tree or grove area shall be shown either as a separate tract or part of a larger tract that meets the requirements of subsection (D) of this section, which shall not be a part of any parcel used for construction of a structure. The size of the tract shall be the minimum necessary as recommended by a consulting arborist to adequately encompass the dripline of the tree, protect the critical root zone and ensure long term survival of the tree or grove.
D. Prior to final plat approval, ownership of the regulated tree or grove tract shall be identified to

distinguish it from lots intended for sale. The tract may be identified as any one of the following:

1. Private open space held by the owner or a homeowners association; or
2. For residential land divisions, private open space subject to an easement conveying stormwater and surface water management rights to the City and preventing the owner of the tract from activities and uses inconsistent with the purpose of this document; or
3. At the owners option, public open space where the tract has been dedicated to the City or other governmental unit; or 4. Any other ownership proposed by the owner and approved by the Community Development Director. (Ord. 99-1013 §10(part), 1999)

17.41.090. Density transfers incentive for Tree Protection Tracts (Option 2).

A. The purpose of this section is to allow density accruing to portions of a property within a regulated tree protection tract to be transferred outside said tract to the remainder of the site. This provision applies on-site and density shall not be transferred beyond the boundaries of the development site.
B. Development applications for subdivisions and minor partitions that request a density transfer shall:
   1. Provide a map showing the net buildable area or height to which the density will be transferred;
   2. Provide calculations justifying the requested density increase;
   3. Demonstrate that the minimum lot size requirements can be met based on an average of all lots created, including the tree protection tract created pursuant to Section 17.41.080, and that no residential lot created is less than 50% of the underlying lot size;
   4. Demonstrate that, with the exception of the tree protection tract created pursuant to Section 17.41.080, no parcels have been created which would be unbuildable in terms of minimum yard setbacks;
   5. Meet all other standards of the base zone except as modified in section 17.41.100.
C. The area of land contained in a tree protection tract may be excluded from the calculations for determining compliance with minimum density requirements of the zoning code.

17.41.100. Permitted Modifications to Dimensional Standards (Option 2 Only).

D. An applicant proposing to protect trees in a dedicated tract pursuant to section 17.41.080 may request, and the Community Development Director, pursuant to a Type II procedure, may grant a reduction to, the lot size, width and depth of the underlying zone district in approving a subdivision or partition if necessary to retain a regulated tree or grove in a tract, as long as the calculation of average lot size, including tracts, meet the minimum lot size for the zone. The permissible reductions are specified in Table 17.41.100.

Table 17.41.100.

ZONE	Min. Lot Size (%)	Min. Lot Width	Min. Lot Depth
R-10	50%	50'	65'
R-8	45%	45'	60'
R-6	40%	35'	55'
R-5	35%	30'	50'
R-3.5	30%	20'	45'

17.41.110. Tree Protection by Restrictive Covenant (Option 3).

Any regulated tree or grove which cannot be protected in a tract pursuant to Section 17.41.080 above shall be protected with a restrictive covenant in a format to be approved by the Community Development Director. Such covenant shall be recorded against the property deed and shall

contain provisions to permanently protect the regulated tree or grove unless such tree or grove, as determined by a certified arborist and approved by the Community Development Director, are determined to be diseased, dying or hazardous.

17.41.120. Permitted Adjustments (Option 3 Only).

A. The Community Development Director, pursuant to a Type II procedure, may grant an adjustment to the side, front and rear yard setback standards by up to 50 percent (50%) if necessary to retain a Regulated Tree or Grove through a restrictive covenant pursuant to this section. The adjustment shall be the minimum necessary to accomplish preservation of trees on the lot and shall not conflict with other conditions imposed on the property.

B. The Community Developmemt Director, pursuant to a Type II procedure, may grant an adjustment to street standards, pursuant to adopted public works standards, in order to preserve a tree. This may include flexibility to redesign sidewalk and planter strip sizes locations and allow placement of sidewalks and planter strips in an easement within private lots.

C. The Community Developmemt Director, pursuant to a Type II procedure, may allow other adjustments in order to preserve any healthy tree that cannot be moved due to its size, but will contribute to the landscape character of the area and will not present a foreseeable hazard if retained.

17.41.130. Regulated Tree Protection Procedures During Construction.

A. No permit for any grading or construction of public or private improvements may be released prior to verification by the Community Development Director that regulated trees designated for protection or conservation have been protected according to the following standards. No trees designated for removal shall be removed without prior written approval from the Community Development Director.

B. Tree protection shall be as recommended by a qualified arborist or, as a minimum, to include the following protective measures:

1. Except as otherwise determined by the Community Development Director, all required tree protection measures set forth in this section shall be instituted prior to any development activities, including, but not limited to clearing, grading, excavation or demolition work, and such measures shall be removed only after completion of all construction activity, including necessary landscaping and irrigation installation, and any required plat, tract, conservation easement or restrictive covenant has been recorded.
2. Approved construction fencing, a minimum of 4 feet tall with steel posts placed no farther than ten feet apart, shall be installed at the edge of the tree protection zone or dripline, whichever is greater. An alternative dripline fencing material secured by metal posts staked at no more than 4 feet on center around the dripline of the tree or grove may be used with the approval of the Community Development Director.
3. Approved signs shall be attached to the fencing stating that inside the fencing is a tree protection zone, not to be disturbed unless prior approval has been obtained from the Community Development Director.
4. No construction activity shall occur within the tree protection zone, including, but not limited to; dumping or storage of materials such as building supplies, soil, waste items; nor passage or parking of vehicles or equipment.
5. The tree protection zone shall remain free of chemically injurious materials and liquids such as paints, thinners, cleaning solutions, petroleum products, and concrete or dry wall excess, construction debris, or run-off.
6. No excavation, trenching, grading, root pruning or other activity shall occur within the tree protection zone unless directed by an arborist present on site and approved by the Community Development Director.
7. No machinery repair or cleaning shall be performed within 10 feet of the dripline of any trees

identified for protection.

8. Digging a trench for placement of public or private utilities or other structure within the critical root zone of a tree to be protected is prohibited. Boring under or through the tree protection zone may be permitted if approved by the Community Development Director and pursuant to the approved written recommendations and on-site guidance and supervision of a Certified Arborist.
9. The City may require that a Certified Arborist be present during any construction or grading activities that may affect the dripline of trees to be protected.
10. The Community Development Director may impose conditions to avoid disturbance to tree roots from grading activities and to protect trees and other significant vegetation identified for retention from harm. Such conditions may include, if necessary, the advisory expertise of a qualified consulting arborist or horticulturist both during and after site preparation, and a special maintenance/management program to provide protection to the resource as recommended by the arborist or horticulturist.

C. Changes in soil hydrology due to soil compaction and site drainage within tree protection areas shall be avoided. Drainage and grading plans shall include provision to ensure that drainage of the site does not conflict with the standards of this section. Excessive site run-off shall be directed to appropriate storm drainage facilities and away from trees designated for conservation or protection.

Oregon City Municipal Code
Chapter 17.42 Flood Management Overlay District

17.42.010 Purpose--Findings.

A. There is established in the city a flood management overlay district. The flood management overlay district is an overlay zone classification defining areas subject to periodic flooding or inundation which can result in property harm or loss, disruption of public services, hazards for public health, or added expense for public services. All conditions and restrictions of land use established by this chapter of the city's zoning ordinance shall be in addition to such restrictions and conditions as may be imposed and established in underlying zoning districts.

B. It is the purpose of this chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

1. To protect human life and health;
   To minimize expenditure of public money and costly flood control projects;
   To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
2. To minimize prolonged business interruptions;
3. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
4. To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
5. To ensure that potential buyers are notified that property is in an area of special flood hazard;
6. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions; and
7. To protect flood management areas, which provide the following functions:
   a. Protect life and property from dangers associated with flooding,
   b. Flood storage, reduction of flood velocities, reduction of flood peak,
   c. Flows and reduction of wind and wave impacts,
   d. Maintain water quality by reducing and sorting sediment loads,
   e. Processing chemical and organic wastes and reducing nutrients, recharge, store and discharge groundwater, and
   f. Provide plant and animal habitat, and support riparian ecosystems.

17.42.020 Applicability.

A. This chapter shall apply to development in the flood management overlay district, which may also be referred to as the "floodplain overlay district" in this code. The flood management overlay district includes all areas of special flood hazards and all flood management areas within the city. The overlay district restricts the uses that are allowed in the base zone by right, with limitations, or as provisional uses.

B. The flood management areas which have been mapped include the following locations:
   1. Land contained within the one hundred-year floodplain, flood area and floodway as shown on the Federal Emergency Management Agency flood insurance maps dated June 17, 2008, including areas of special flood hazard pursuant to Section 17.42.040 and the area of inundation for the February 1996 flood; and
   2. Lands that have physical or documented evidence of flooding within recorded history

based on aerial photographs of the 1996 flooding and/or the water quality and flood management areas maps.

C. The standards that apply to the flood management areas apply in addition to state or federal restrictions governing floodplains or flood management areas.

17.42.030 Basis for establishing the areas of special flood hazard.

The areas or special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study for Clackamas County, Oregon and Incorporated Areas," dated June 17, 2008, with accompanying flood insurance maps is adopted by reference and declared to be a part of this chapter. The flood insurance study is on file at the office of the city recorder in the City Hall.

17.42.040 Compliance.

No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of these floodplain regulations and other applicable regulations. Violations of the provisions of this chapter by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a civil infraction. Any person who violates this chapter or fails to comply with any of its requirements shall be subject to the enforcement procedures of this code per OCMC 1.20 Civil Infractions and 1.24 Code Enforcement. Nothing herein contained shall prevent the city from taking such other lawful action as is necessary to prevent or remedy.

17.42.050 Abrogation and interpretation.

This chapter is not intended to repeal, abrogate or impair any existing easements, covenants or deed restrictions. All provisions shall be considered as minimum requirements and liberally construed in favor of the governing body. Where this chapter and another section, easement, covenant or deed restriction conflict or overlap, whichever imposes the more stringent restriction shall prevail.

17.42.060 Warning and disclaimer of liability.

The degree of flood protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This chapter does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flooding damages. This chapter shall not create liability on the part of the city, any officer or employee thereof, or the Federal Insurance Administration for any flood damages that result from reliance on this chapter or any administrative decision lawfully made thereunder.

17.42.070 Severability.

The provisions of this chapter are severable. If any section, clause or phrase of this chapter is adjudged to be invalid by a court of competent jurisdiction, the decision of that court shall not affect the validity of the remaining portions of this chapter.

17.42.080 Administration.

This chapter establishes a flood management overlay district, which is delineated on the water quality and flood management areas map attached and incorporated by reference as a part of this document.

A. The following maps and studies are adopted and declared to be a part of this chapter. These maps are on file in the office of the city recorder:

1. The Water Quality and Flood Management Areas Map, dated June 7, 1999;

2. The Federal Insurance Administration, Flood Insurance Rate Maps for Clackamas County, Oregon and Incorporated Areas dated June 17, 2008;

3. The Federal Insurance Administration (FIA) "Flood Insurance Rate Maps for Clackamas County, Oregon and Incorporated Areas," dated June 17, 2008.

B. Applicants are required to provide the city with a delineation of the flood management areas on the subject property as part of any application. An application shall not be complete until this delineation is submitted to the city.

C. The city shall review the water quality and flood management areas maps during periodic review as required by ORS 197.633 (1997).

D. Development Permit.

1. A development permit shall be obtained before construction or development begins within any portion of the flood management overlay district. The permit shall be for all structures, including manufactured homes and all other development, including fill and other activities, as set forth in Chapter 17.04 (Definitions).

2. Application for a development permit shall be made on forms furnished by the community development department. Requirements may include, but are not limited to: plans in duplicate drawn to scale showing the nature, location, dimensions and elevations of the area in question; existing or proposed structures, fill, storage materials, drainage facilities; and the location of the foregoing.

3. The following information is specifically required:

a. Elevation in relation to mean sea level of the lowest floor (including basement) of all structures;

b. Elevation in relation to mean sea level to which any structure has been floodproofed;

c. Certification by a registered professional engineer or architect that the floodproofing methods for any nonresidential structure meet the floodproofing criteria in Section 17.42.170(E)(5); and

d. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

17.42.090 Building official--Duties and responsibilities.

A. The city building official, defined as the local floodplain administrator, is appointed to administer and implement this chapter by granting or denying development permit applications in accordance with its provisions.

B. Duties of the building official shall include, but not be limited to those listed in this chapter.

C. The building official shall:

1. Review all development permits to determine that the permit requirements of this title have been satisfied;

2. Review all development permits to determine that all necessary permits have been obtained from those federal, state or local governmental agencies from which prior approval is required; and

3. Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the encroachment provisions of Section 17.42.200 are met.

17.42.100 Use of other base flood data.

When base flood elevation data has not been provided in accordance with Section 17.42.030, the building official shall obtain, review and reasonably utilize any base flood elevation and floodway data available from a federal, state or other source, in order to administer Sections 17.42.160 and 17.42.200.

17.42.110 Information to be obtained and maintained.

The building official shall:

A. Where base flood elevation data is provided through the flood insurance study, FIRM or required as in Section 17.42.100, obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structures, and whether or not the structure contains a basement.

B. For all new or substantially improved floodproofed structures where base flood elevation data is provided through the flood insurance study, FIRM, or as required in Section 17.42.080:
   1. Verify and record the actual elevation (in relation to mean sea level); and
   2. Maintain the floodproofing certifications required in Section 17.42.080(C)(3);
   3. Maintain for public inspection all records pertinent to the provisions of this chapter.

17.42.120 Alteration of watercourses.

A. Notify adjacent communities and the department of land conservation and development prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administration.

B. Require that maintenance is provided within the altered or relocated portion of the watercourse so that the flood-carrying capacity is not diminished.

17.42.130 Map administration.

A. The purpose of this section is to provide a process for interpreting and amending the water quality and flood management areas map to clarify and correct the location of flood management overlay district.

B. Interpretation of Map Boundaries. The building official shall make interpretations, where needed, as to exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in Section 17.42.150.

C. Map corrections shall be processed pursuant to the requirements of Chapter 17.68:
   1. Within ninety days of receiving information establishing a possible error in the existence or location of the flood management overlay district, the city shall provide notice to interested parties of a public hearing at which the city will review the information.
   2. The city shall amend the water quality and flood management areas map if the information demonstrates that the boundaries of the flood management overlay district have changed since adoption of the water quality and flood management areas map by Metro (June 18, 1998) provided that, in the case of a boundary established by FEMA, a letter of map amendment (LOMA) or letter of map revision is obtained from FEMA prior to any map change.

17.42.140 Appeals and variance procedure.

A. The purpose of this section is to ensure that compliance with this chapter does not cause unreasonable hardship. To avoid such instances, the requirements of this chapter may be varied. Variances are also allowed when strict application of this chapter would deprive an owner of all economically viable use of land.

B. This section applies to requests to vary from the standards of this chapter only. Requests to vary from other standards of this title shall be subject to the requirements of Chapter 17.60.
1. Variance applications made pursuant to this section shall follow the variance procedures outlined in Chapter 17.50.
2. In addition to the public notice requirements outlined in Section 17.50.090, Metro shall be notified within fourteen days of the city receiving an application to vary the requirements of this section and within fourteen days of a decision on the variance.
3. The requirements of Section 17.60.020 (Variances--Grounds) do not apply to requests to vary from the standards of Chapter 17.42.
4. If an application to vary from the standards of Chapter 17.42 is made in conjunction with an application to vary from other standards of this chapter, the variances may be processed as one application, provided the standards applicable to each variance requested must be met before the requested variance may be granted.

C. Hardship Variance. Variances to avoid unreasonable hardship caused by the strict application of this chapter are permitted subject to the criteria set forth in this section. To vary from the requirements of this chapter, the applicant must demonstrate the following:
1. The variance is the minimum necessary to allow the proposed use or activity;
2. The variance will not increase danger to life and property due to flooding or erosion;
3. The impact of the increase in flood hazard which will result from the variance will not prevent the city from meeting the requirements of this chapter. In support of this criteria the applicant shall have a qualified professional engineer document the expected height, velocity and duration of floodwaters, and estimate the rate of increase in sediment transport of the floodwaters expected both downstream and upstream as a result of the variance;
4. The variance will not increase the cost of providing and maintaining public services during and after flood conditions so as to unduly burden public agencies and taxpayers; and
5. The proposed use complies with the standards of the base zone.

D. The planning commission shall hear and decide appeals and requests for variances when it is alleged there is an error in any requirement, decision or determination made by the building official in the enforcement or administration of these regulations, or that enforcement of this district would result in exceptional hardship. In passing upon such applications, the planning commission shall consider all technical evaluations, all relevant factors, standards specified in other sections of this title, and:
1. The danger that materials may be swept onto other lands to the injury of others;
2. The danger to life and property due to flooding or erosion damage;
3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
4. The importance of the services provided by the proposed facility to the community;
5. The necessity to the facility of a waterfront location, where applicable;
6. The availability of alternative locations for the proposed use, which are not subject to flooding or erosion damage;
7. The compatibility of the proposed use with existing and anticipated development;
8. The relationship of the proposed use to the comprehensive plan and floodplain management program for that area;
9. The safety of access to the property in times of flood for ordinary and emergency vehicles;
10. The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site; and
11. The cost of providing governmental services during and after flood conditions, including

maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water systems, and streets and bridges.

E. Upon consideration of the factors listed in subsection D of this section and the purposes of this district, the planning commission may attach such conditions to the granting of variances as it deems necessary to meet the purposes of this district.

F. The city recorder shall maintain the records of all appeal actions and the building official shall report any granted variances to the Federal Insurance Administration upon request.

17.42.150 Conditions for variances.

The planning commission, pursuant to Chapter 17.60, may impose such conditions as are deemed necessary to limit any adverse impacts that may result from granting relief. If a variance is granted pursuant to Section 17.42.140, the variance shall be subject to the conditions set out in this section. In addition to other standards listed in Section 17.42.160, the following conditions must be met:

A. Variances may be issued for the reconstruction, rehabilitation or restoration of structures listed on the National Register or identified as a locally designated historic structure and without regard to the procedures set forth in the remainder of this chapter.

B. Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.

C. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

D. Variances shall only be issued upon a showing of good and sufficient cause.

E. A determination that failure to grant the variance would result in exceptional hardship to the applicant.

F. Variances as interpreted in the national flood insurance program are based on the general zoning law principle that they pertain to a physical piece or property; they are not personal in nature and do not pertain to the structure, its inhabitants, economic or financial circumstances. They primarily address small lots in densely populated residential neighborhoods. As such, variances from the flood elevations should be quite rare.

G. Variances may be issued for nonresidential buildings in very limited circumstances to allow a lesser degree of floodproofing than watertight or dry-floodproofing, where it can be determined that such action will have low damage potential, complies with all other variance criteria as set forth in this chapter.

H. Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with the lowest flood elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

17.42.160 Flood management area standards.

A. Uses Permitted Outright:

1. Excavation and fill required to plant any new trees or vegetation.

2. Restoration or enhancement of floodplains, riparian areas, wetland, upland and streams that meet federal and state standards provided that any restoration project which encroaches on the floodway complies with the requirements of Section 17.42.190 (Floodways).

B. Provisional Uses.

1. All uses allowed in the base zone or existing flood hazard overlay zone are allowed in the flood management overlay district subject to compliance with the development standards of this section.

C. Prohibited Uses.

1. Any use prohibited in the base zone;

2. Uncontained areas of hazardous materials as defined by the Department of Environmental Quality.

D. Site Development Standards. All development in the floodplain shall conform to the following balanced cut and fill standards:

1. This subsection does not apply to work necessary to protect, repair, maintain or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies provided that, after the emergency has passed, adverse impacts are mitigated in accordance with applicable standards.

2. No net fill in any floodplain is allowed. All fill placed in a floodplain shall be balanced with at least an equal amount of soil material removed. For the purposes of calculating net fill, fill shall include any structure below the design flood elevation that has been floodproofed pursuant to subsection (E)(5) of this section.

3. Any excavation below bankfull stage shall not count toward compensating for fill.

4. Excavation to balance a fill shall be located on the same parcel as the fill unless it is not practicable to do so. In such cases, the excavation shall be located in the same Oregon City floodplain, so long as the proposed excavation and fill will not increase flood impacts for surrounding properties as determined through hydrologic and hydraulic analysis.

5. For excavated areas identified by the city to remain dry in the summer, such as parks or mowed areas, the lowest elevation of the excavated area shall be at least six inches above the winter "low water" elevation, and sloped at a minimum of two percent towards the protected water feature pursuant to Chapter 17.49. One percent slopes will be allowed in smaller areas.

6. For excavated areas identified by the city to remain wet in the summer, such as a constructed wetland, the grade shall be designed not to drain into the protected water feature pursuant to Chapter 17.49.

7. Parking areas in the floodplain shall be accompanied by signs that inform the public that the parking area is located in a flood management area and that care should be taken when the potential for flooding exists.

8. Temporary fills permitted during construction shall be removed at the end of construction, thirty days after subdivision acceptance or completion of the final inspection.

9. New culverts, stream crossings and transportation projects shall be designed as balanced cut and fill projects or designed not to significantly raise the design flood elevation. Such projects shall be designed to minimize the area of fill in flood management areas and to minimize erosive velocities. Stream crossings shall be as close to perpendicular to the stream as practicable. Bridges shall be used instead of culverts wherever practicable.

10. Excavation and fill required for the construction of detention facilities or structures, and other facilities, such as levees, specifically shall be designed to reduce or mitigate flood impacts and improve water quality. Levees shall not be used to create vacant buildable lands.

E. Construction Standards.

1. Anchoring.

a. All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure.

b. All manufactured homes must likewise be anchored to prevent flotation, collapse or lateral movements and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (reference FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebooks for additional techniques).

2. Construction Materials and Methods.

a. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

b. All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.
c. Electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.
3. Utilities.
a. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.
b. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharge from the systems into floodwaters.
c. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.
4. Residential Construction.
a. New construction and substantial improvements of any residential structure shall have the lowest floor, including basement, elevated to at least one foot above the design flood elevation.
b. Fully enclosed areas below the lowest floor that are subject to flooding are prohibited unless they are designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:
i. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.
ii. The bottom of all openings shall be no higher than one foot above grade.
iii. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.
5. Nonresidential Construction.
a. New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated to at least one foot above base flood elevation; or, together with attendant utility and sanitary facilities, shall:
i. Be floodproofed so that below the design flood level the structure is watertight with walls substantially impermeable to the passage of water provided that the requirements of subsection (D)(2) of this section are met;
ii. Have structured components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;
iii. Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications and plans. Such certifications shall be provided to the official as set forth in Section 17.42.110(B);
iv. Nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in subsection (E)(4)(b) of this section; and
v. Applicants floodproofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g., a building constructed to the design flood level will be rated as one foot below that level).
6. Manufactured Homes. The following standards apply to all manufactured homes to be placed or substantially improved on sites within Zone AE on the community's FIRM.
a. On sites which are (i) outside of a manufactured home park or subdivision, (ii) in a new manufactured home park or subdivision, (iii) in an expansion to an existing manufactured

home park or subdivision, or (iv) in an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood; the manufactured home shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated one foot above the base flood elevation and be securely anchored to an adequately designed foundation system to resist flotation, collapse and lateral movement.

b. On sites within an existing manufactured home park or subdivision that are not subject to the above manufactured home provisions, the manufactured home shall be elevated so that either:

i. The lowest floor of the manufactured home is elevated one foot above the base flood elevation, or

ii. The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than thirty-six inches in height above grade and be securely anchored to an adequately designed foundation system to resist flotation, collapse and lateral movement.

F. Recreational Vehicles. Recreational vehicles placed on sites within Zones A1-30, AH and AE as shown on the flood insurance rate map shall:

1. Be on site for fewer than one hundred eighty consecutive days, and be fully licensed and ready for highway use, on its wheels or jacking system, attached to the site only by quick disconnect type utilities and security devices, and have no permanently attached additions; or

2. Meet the requirements of subsection (E)(6) of this section and the elevation and anchoring requirements for manufactured homes.

17.42.170 Review of building permits.

Where elevation data is not available either through the flood insurance study, FIRM or from another authoritative source (Section 17.42.110), application for building permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness shall be made by the building official, considering use of historical data, high water marks, photographs of past floodings, etc., where available, and the provisions of this title. Failure to elevate at least two feet above grade in these zones may result in higher insurance rates.

17.42.180 Subdivision standards.

A. Subdivision Proposals.

1. All subdivision proposals shall be consistent with the need to minimize flood damage.

2. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize or eliminate flood damage.

3. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage.

4. Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least fifty lots or five acres (whichever is less).

5. All structures and site grading developed or conducted in conjunction with a subdivision proposal shall comply with Section 17.42.160, flood management area standards.

B. The purpose of this section is to allow density accruing to portions of a property within the flood management overlay district to be transferred outside the overlay district.

1. Density transfers shall be allowed if the applicant demonstrates compliance with the following standards:

a. The density transfer is proposed as part of a subdivision.

b. Minimum density standards will not increase due to the density transfers.

c. The area of land contained in a flood management area may be excluded from the calculations for determining compliance with minimum density requirements of the zoning code.

17.42.190 Floodways.

Located within areas of special flood hazard established in Section 17.42.030 are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles and erosion potential, the following provisions apply:

A. Encroachments, including fill, new construction, substantial improvements and other development shall be prohibited unless certification by a registered professional engineer or architect is provided demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

B. If subsection A of this section is satisfied, all new construction and substantial improvements shall comply with all applicable flood management area standards of Sections 17.42.160 through 17.42.190.

C. Below-grade crawlspace construction is allowed in the floodplain in accordance with the Oregon Residential Specialty Code and the Oregon State Structural Specialty Code as adopted by local building code.

Oregon City Municipal Code
Chapter 17.44 US – Geologic Hazards

17.44.010 Intent and Purpose.

The intent and purpose of the provisions of this chapter are:

A. To ensure that activities in geologic hazard areas are designed based on detailed knowledge of site conditions in order to reduce the risk of private and public losses;
B. To establish standards and requirements for the use of lands within geologic hazard areas;
C. To provide safeguards to prevent undue hazards to property, the environment, and public health, welfare, and safety in connection with use of lands within geologic hazard areas;
D. To mitigate risk associated with geologic hazard areas, not to act as a guarantee that the hazard risk will be eliminated, nor as a guarantee that there is a higher hazard risk at any location. Unless otherwise provided, the geologic hazards regulations are in addition to generally applicable standards provided elsewhere in the Oregon City Municipal Code.

17.44.025 When Required; Regulated Activities; Permit and Approval Requirements.

No person sball engage in any of the following regulated activities within the adopted Oregon City Geologic Hazards Overlay Zone without first obtaining permits or approvals as required by this chapter:

A. Installation or construction of an accessory structure greater than 500 square feet in area;
B. Development of land, construction, reconstruction, structural alteration, relocation or enlargement of any building or structure for which permission is required pursuant to the Oregon City Municipal Code;
C. Tree removal on slopes greater than 25% where canopy area removal exceeds 25% of the lot.
D. Excavation which exceeds two feet in depth, or which involves twenty-five or more cubic yards of volume;

The requirements of this chapter are in addition to other provisions of the Oregon City Municipal Code. Where the provisions of this chapter conflict with other provisions of the Oregon City Municipal Code, the provisions that are the more restrictive of regulated development activity shall govern.

17.44.030 Procedures.

No building or site development permit or other authorization for development shall be issued until the plans and other documents required by this chapter have been reviewed and found by the review authority to comply with the requirements of this chapter.

A. Where the development is part of a land use permit application, review shall occur in the manner established in Chapter 17.50 for review of land use decisions.
B. Where the development is part of a limited land use permit application, review shall occur in the manner established in Chapter 17.50 for review of limited land use decisions.
C. Where the development is solely part of a grading permit or building permit, the City Engineer may allow review to occur in the manner established in Title 15, Chapter 15.04 and 15.48 if the application meets 17.44.060 development standards.
D. For any other proposed development not otherwise subject to review as a land use or limited land use permit application, review shall occur in the manner established in Chapter 17.50 for limited land use decisions.

17.44.035 Exemptions.

The following activities, and persons engaging in same, are EXEMPT from the provisions of this chapter.

A. An excavation which is less than two feet in depth, or which involves less than twenty-five cubic yards of volume;
B. A fill which does not exceed two feet in depth or twenty-five cubic yards of volume;
C. Structural alteration of any structure of less than 500 square feet that does not involve grading as defined in this chapter;
D. Installation, construction, reconstruction, or replacement of utility lines in city right-of-way, or public easement, not including electric substations;
E. The removal or control of noxious vegetation;
F. Emergency actions which must be undertaken immediately to prevent an imminent threat to public health or safety, or prevent imminent danger to public or private property. The person undertaking emergency action shall notify the Building Official on all regulated activities associated with any building permit or City Engineer/Public Works Director on all others within one working day following the commencement of the emergency activity. If the City Engineer/Public Works Director or Building Official determine that the action or part of the action taken is beyond the scope of allowed emergency action, enforcement action may be taken.

17.44.050 Development - Application Requirements and Review Procedures and Approvals.

Except as provided by subsection B of this section, the following requirements apply to all development proposals subject to this chapter:

A. A geological assessment and geotechnical report that specifically includes, but is not limited to:
    1) Comprehensive information and data regarding the nature and distribution of underlying geology, the physical and chemical properties of existing soils and groundwater; an opinion of site geologic stability, and conclusions regarding the effect of geologic conditions on the proposed development. In addition to any field reconnaissance or subsurface investigation performed for the site, the following resources, as a minimum, shall be reviewed to obtain this information and data:
        a) The State of Oregon Department of Geology and Mineral Industries (DOGAMI) in Bulletin 99, Geology and Geological Hazards of North Clackamas County, Oregon (1979), or in any subsequent DOGAMI mapping for the Oregon City area;
        b) Portland State University study entitled "Environmental Assessment of Newell Creek Canyon, Oregon City, Oregon" (1992);
        c) Portland State University study, "Landslides in the Portland, Oregon, Metropolitan Area Resulting from the Storm of February 1996: Inventory Map, Database and Evaluation" (Burns and others, 1998);
        d) DOGAMI Open File Report O-06-27, "Map of Landslide Geomorphology of Oregon City, Oregon, and Vicinity Interpreted from LIDAR Imagery and Aerial Photographs" (Madin and Burns, 2006);
        e) "Preliminary Geologic Map of the Oregon City Quadrangle, Clackamas County, Oregon" (Madin, in press);
    2) Information and recommendations regarding existing local drainage, proposed permit activity impacts on local drainage, and mitigation to address adverse impacts;
    3) Comprehensive information about site topography;
    4) Opinion as to the adequacy of the proposed development from an engineering standpoint;
    5) Opinion as to the extent that instability on adjacent properties may adversely affect the project;

6) Description of the field investigation and findings, including logs of subsurface conditions and laboratory testing results;
7) Conclusions regarding the effect of geologic conditions on the proposed development, tree removal, or grading activity;
8) Specific requirements and recommendations for plan modification, corrective grading, and special techniques and systems to facilitate a safe and stable site;
9) Recommendations and types of considerations as appropriate for the type of proposed development:
    a. General earthwork considerations, including recommendations for temporary and permanent cut and fill slopes and placement of structural fill,
    b. Location of residence on lot,
    c. Building setbacks from slopes,
    d. Erosion control techniques applicable to the site,
    e. Surface drainage control to mitigate existing and potential geologic hazards,
    f. Subdrainage and/or management of groundwater seepage,
    g. Foundations,
    h. Embedded/retaining walls,
    i. Management of surface water and irrigation water, and
    j. Impact of the development on the slope stability of the lot and the adjacent properties.
10) Scaled drawings that describe topography and proposed site work, including:
    a. Natural physical features, topography at two or ten-foot contour intervals locations of all test excavations or borings, watercourses both perennial and intermittent, ravines and all existing and manmade structures or features all fully dimensioned, trees six-inch caliper or greater measured four feet from ground level, rock outcroppings and drainage facilities;
    b. All of the features and detail required for the site plan above, but reflecting preliminary finished grades and indicating in cubic yards whether and to what extent there will be a net increase or loss of soil.
    c. A cross-section diagram, indicating depth, extent and approximate volume of all excavation and fills.
12) For properties greater than 1 acre, a preliminary hydrology report, prepared by a suitably qualified and experienced hydrology expert, addressing the effect upon the watershed in which the proposed development is located; the effect upon the immediate area's stormwater drainage pattern of flow, the impact of the proposed development upon downstream areas and upon wetlands and water resources; and the effect upon the groundwater supply.

B. Review Procedures and Approvals require the following:

1) Examination to ensure that:
    a) Required application requirements are completed;
    b) Geologic assessment and geotechnical report procedures and assumptions are generally accepted; and
    c) All conclusions and recommendations are supported and reasonable.
2) Conclusions and recommendations stated in an approved assessment or report shall then be directly incorporated as permit conditions or provide the basis for conditions of approval for the regulated activity.
3) All geologic assessments and geotechnical reports shall be reviewed by an engineer certified for expertise in geology or geologic engineering and geotechnical engineering, respectively, as determined by the City. The City will prepare a list of prequalified consultants for this purpose. The cost of review by independent review shall be paid by the applicant.

C. The city engineer may waive one or more requirements of subsections A and B of this section if the city engineer determines that site conditions, size or type or development of grading

requirements do not warrant such detailed information. If one or more requirements are waived, the city engineer shall, in the staff report or decision, identify the waived provision(s), explain the reasons for the waiver, and state that the waiver may be challenged on appeal and may be denied by a subsequent review authority.

17.44.060 Development Standards.

Notwithstanding any contrary dimensional or density requirements of the underlying zone, the following standards shall apply to the review of any development proposal subject to this chapter. Requirements of this chapter are in addition to other provision of the Oregon City Municipal Code. Where provision of this chapter conflict with other provision of the Oregon City Municipal Code , the provisions that are more restrictive of regulated development activity shall govern.

A. All developments shall be designed to avoid unnecessary disturbance of natural topography, vegetation and soils. To the maximum extent practicable as determined by the review authority, tree and ground cover removal and fill and grading for residential development on individual lots shall be confined to building footprints and driveways, to areas required for utility easements and for slope easements for road construction, and to areas of geotechnical remediation.
B. All grading, drainage improvements, or other land disturbances shall only occur from May 1 to October 31. Erosion control measures shall be installed and functional prior to any disturbances. The City Engineer may allow grading, drainage improvements or other land disturbances to begin before May 1 (but no earlier than March 16) and end after October 31 (but no later than November 30), based upon weather conditions and in consultation with the project geotechnical engineer. The modification of dates shall be the minimum necessary, based upon the evidence provided by the applicant, to accomplish the necessary project goals. Temporary protective fencing shall be established around all trees and vegetation designed for protection prior to the commencement of grading or other soil disturbance.
C. Designs shall minimize the number and size of cuts and fills.
D. Cut and fill slopes, such as those for a street, driveway accesses, or yard area, greater than seven feet in height (as measured vertically) shall be terraced. Faces on a terraced section shall not exceed five feet. Terrace widths shall be a minimum of three feet and shall be vegetated. Total cut and fill slopes shall not exceed a vertical height of fifteen feet. Except in connection with geotechnical remediation plans approved in accordance with the chapter, cuts shall not remove the toe of any slope that contains a known landslide or is greater than twenty-five percent slope. The top of cut or fill slopes not utilizing structural retaining walls shall be located a minimum of one-half the height of the cut slope from the nearest property line.
E. Any structural fill shall be designed by a suitably qualified and experienced civil or geotechnical engineer licensed in Oregon in accordance with standard engineering practice. The applicant's engineer shall certify that the fill has been constructed as designed in accordance with the provisions of this chapter.
F. Retaining walls shall be constructed in accordance with the Oregon Structural Specialty Code adopted by the State of Oregon.
G. Roads shall be the minimum width necessary to provide safe vehicle and emergency access, minimize cut and fill and provide positive drainage control. The review authority may grant a variance from the City's required road standards upon findings that the variance would provide safe vehicle and emergency access and is necessary to comply with the purpose and policy of this chapter.
H. Density shall be determined as follows
    1) For those areas with slopes less than twenty-five percent between grade breaks, the allowed density shall be that permitted by the underlying zoning district;

2) For those areas with slopes of twenty-five to thirty-five percent between grade breaks, the density shall not exceed two dwelling units per acre except as otherwise provided in subsection I of this section;
3) For those areas with slopes over thirty-five percent between grade breaks, development shall be prohibited except as otherwise provided in subsection I 4 of this section.

I. For properties with slopes of twenty-five to thirty-five percent between grade breaks:
1) For those portions of the property with slopes of twenty-five to thirty-five percent, the maximum residential density shall be limited to two dwelling units per acre; provided, however, that where the entire site is less than one-half acre in size, a single dwelling shall be allowed on a lot or parcel existing as of January 1, 1994 and meeting the minimum lot size requirements of the underlying zone;
2) An individual lot or parcel with slopes between twenty-five and thirty-five percent shall have no more than fifty percent or four thousand square feet of the surface area, whichever is smaller, graded or stripped of vegetation or covered with structures or impermeable surfaces.
3) No cut into a slope of twenty-five to thirty-five percent for the placement of a housing unit shall exceed a maximum vertical height of 15 feet for the individual lot or parcel.
4) For those portions of the property with slopes over thirty-five percent between grade breaks:
a. Notwithstanding any other City land use regulation, development other than roads, utilities, public facilities and geotechnical remediation shall be prohibited; provided, however, that the review authority may allow development upon such portions of land upon demonstration by an applicant that failure to permit development would deprive the property owner of all economically beneficial use of the property. This determination shall be made considering the entire parcel in question and contiguous parcels in common ownership on or after January 1, 1994, not just the portion where development is otherwise prohibited by this chapter. Where this showing can be made on residentially zoned land, development shall be allowed and limited to one single-family residence. Any development approved under this chapter shall be subject to compliance with all other applicable City requirements as well as any applicable State, Federal or other requirements;
b. To the maximum extent practicable as determined by the review authority, the applicant shall avoid locating roads, utilities, and public facilities on or across slopes exceeding thirty-five percent.

J. The geotechnical engineer of record shall review final grading, drainage, and foundation plans and specifications and confirm in writing that they are in conformance with the recommendations provided in their report.

K. At the City's discretion, peer review shall be required for the geotechnical evaluation/investigation report submitted for the development and/or lot plans. The peer reviewer shall be selected by the City. The applicant's geotechnical engineer shall respond to written comments provided by the City's peer reviewer prior to issuance of building permit.

L. The review authority shall determine whether the proposed methods of rendering a known or potential hazard site safe for construction, including proposed geotechnical remediation methods, are feasible and adequate to prevent landslides or damage to property and safety. The review authority shall consult with the City's geotechnical engineer in making this determination. Costs for such consultation shall be paid by the applicant. The review authority may allow development in a known or potential hazard area as provided in this chapter if specific findings are made that the specific provisions in the design of the proposed development will prevent landslides or damage. The review authority may impose any conditions, including limits on type or intensity of land use, which it determines are necessary to assure that landslides or property damage will not occur.

17.44.070 Access to Property.

A. Shared private driveways may be required if the city engineer or principal planner determines that their use will result in safer location of the driveway and lesser amounts of land coverage than would result if separate private driveways are used.
B. Innovations in driveway design and road construction shall be permitted in order to keep grading and cuts or fills to a minimum and to achieve the purpose and policy of this chapter.
C. Points of access to arterials and collectors shall be minimized.
D. The city engineer or principal planner shall verify that adequate emergency services can be provided to the site.

17.44.080 Utilities.

All new service utilities, both on-site and off-site, shall be placed underground and under roadbeds where practicable. Every effort shall be made to minimize the impact of utility construction. Underground utilities require the geologic hazards permitting and review prescribed herein.

17.44.090 Stormwater Drainage.

The applicant shall submit a permanent and complete stormwater control plan. The program shall include, but not be limited to the following items as appropriate: curbs, gutters, inlets, catch basins, detention facilities and stabilized outfalls. Detention facilities shall be designed to City standards as set out in the City's drainage master plan and design standards. The review authority may impose conditions to ensure that waters are drained from the development so as to limit degradation of water quality consistent with Oregon City's Title III section of the Oregon City Municipal Code Chapter 17.49 and the Oregon City Public Works Stormwater Management Design Manual and Standards Plan or other adopted standards subsequently adopted by the City Commission. Drainage design shall be approved by the city engineer before construction, including grading or other soil disturbance, has begun.

17.44.100 Construction Standards.

During construction on land subject to this chapter, the following standards shall be implemented by the developer:
A. All development activity shall minimize vegetation removal and soil disturbance and shall provide positive erosion prevention measures in conformance with OCMC Chapter 17.47 – Erosion and Sediment Control.
B. No grading, clearing or excavation of any land shall be initiated prior to approval of the grading plan, except that the city engineer shall authorize the site access, brush to be cleared and the location of the test pit digging prior to approval of such plan to the extent needed to complete preliminary and final engineering and surveying. The grading plan shall be approved by the city engineer as part of the city's review under this chapter. The developer shall be responsible for the proper execution of the approved grading plan.
C. Measures shall be taken to protect against landslides, mudflows, soil slump and erosion. Such measures shall include sediment fences, straw bales, erosion blankets, temporary sedimentation ponds, interceptor dikes and swales, undisturbed buffers, grooving and stair stepping, check dams, etc. The applicant shall comply with the measures described in the Oregon City Public Works Standards for Erosion and Sedimentation Control (Ordinance 99-1013).
D. All disturbed vegetation shall be replanted with suitable vegetation upon completion of the grading of the steep slope area.

E. Existing vegetative cover shall be maintained to the maximum extent practicable. No grading, compaction or change in ground elevation, soil hydrology and/or site drainage shall be permitted within the drip line of trees designated for protection, unless approved by the City.
F. Existing perennial and intermittent watercourses shall not be disturbed unless specifically authorized by the review authority. This includes physical impacts to the stream course as well as siltation and erosion impacts.
G. All soil erosion and sediment control measures shall be maintained during construction and for one year after development is completed, or until soils are stabilized by revegetation or other measures to the satisfaction of the city engineer. Such maintenance shall be the responsibility of the developer. If erosion or sediment control measures are not being properly maintained or are not functioning properly due to faulty installation or neglect, the City may order work to be stopped. (Ord. 03-1014, Att. B3 (part), 2003: Ord. 94-1001 §2(part), 1994)
H. All newly created lots, either by subdivision or partition, shall contain building envelopes with a slope of 35% or less.
I. The applicant's geotechnical engineer shall provide special inspection during construction to confirm that the subsurface conditions and assumptions made as part of their geotechnical evaluation/investigation are appropriate. This will allow for timely design changes if site conditions are encountered that are different from those anticipated.
J. Prior to issuing an occupancy permit, the geotechnical engineer shall prepare a summary letter stating that the soils- and foundation-related project elements were accomplished in substantial conformance with their recommendations.

17.44.110 Approval of Development.

The city engineer shall review the application and verify, based on the applicant's materials and the land use record, whether the proposed development constitutes a hazard to life, property, natural resources or public facilities. If, in the city engineer's opinion, a particular development poses such a hazard, the city engineer shall recommend to the review authority permit conditions designed to reduce or eliminate the hazard. These conditions may include, but are not limited to, prohibitions on construction activities between November 1st and March 31st.

17.44.120 Liability.

Approval of an application for development on land subject to this chapter shall not imply any liability on the part of the city for any subsequent damage due to earth slides. Prior to the issuance of a building permit, a waiver of damages and an indemnity and hold harmless agreement shall be required which releases the City from all liability for any damages resulting from the development approved by the City's decision.

17.44.130 Compliance.

Nothing contained in this chapter shall relieve the developer of the duty to comply with any other provision of law. In the case of a conflict, the more restrictive regulation shall apply.

17.44.140 Appeal.

The review authority's decision may be appealed in the manner set forth in Chapter 17.50.

17.46 Park Acquisition

Deleted Chapter

Oregon City Municipal Code
Chapter 17.47 Erosion and Sediment Control

17.47.010 Purpose.

A. The purpose of this chapter is to require erosion prevention measures and sediment control practices for all development during construction to prevent and restrict the discharge of sediments, and to require final permanent erosion prevention measures, which may include landscaping, after development is completed. Erosion prevention techniques shall be designed to protect soil particles from the force of water and wind and other mechanical means so that they will not be transported from the site. Sediment control measures shall be designed to capture soil particles after they have become dislodged by erosion and attempt to retain the soil particles on site.
B. The objective of these measures is to control, at the source, waterborne and airborne erosion and the air and water pollution that results from such erosion mechanisms. This chapter recognizes that all non-point discharges eventually end up in surface water bodies. This chapter is intended to control water quality degradation from construction and development activities and it applies in addition to any other applicable provision of this code, state or federal law. This chapter is not intended to serve as a guideline for stormwater management control measures for already constructed developments.

17.47.030 Applicability.

A. This chapter, which may also be referred to as "erosion control" in this code, applies to development that may cause visible or measurable erosion on any property within the city limits of Oregon City.
B. This chapter does not apply to work necessary to protect, repair, maintain or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies, provided that after the emergency has passed, adverse impacts are mitigated in accordance with applicable standards.

17.47.040 Abrogation and greater restrictions.

Where the provisions of this chapter are less restrictive or conflict with comparable provisions of the zoning ordinance, regional, state or federal law, the provisions that are more restrictive shall govern. Where this document imposes restrictions that are more stringent than regional, state and federal law, the provisions of this document shall govern. However, nothing in this chapter shall relieve any party from the obligation to comply with any applicable federal, state or local regulations or permit requirements.

17.47.050 Severability.

The provisions of this chapter are severable. If any section, clause or phrase of this chapter is adjudged to be invalid by a court of competent jurisdiction, the decision of that court shall not affect the validity of the remaining portions of this chapter.

17.47.060 Permit required.

The applicant must obtain an erosion and sediment control permit prior to, or contemporaneous with, the approval of an application for any building, land use or other city-issued permit that may cause visible or measurable erosion.

17.47.070 Erosion and sediment control plans.

A. An application for an erosion and sediment control permit shall include an erosion and sediment control plan, which contains methods and interim measures to be used during and following construction to prevent or control erosion prepared in compliance with city of Oregon City public works standards for erosion and sediment control. These standards are incorporated herein and made a part of this title and are on file in the office of the city recorder.

B. Approval Standards. An erosion and sediment control plan shall be approved only upon making the following findings:

1. The erosion and sediment control plan meets the requirements of the city of Oregon City public works standards for erosion and sediment control incorporated by reference as part of this chapter;
2. The erosion and sediment control plan indicates that erosion and sediment control measures will be managed and maintained during and following development. The erosion and sediment control plan indicates that erosion and sediment control measures will remain in place until disturbed soil areas are permanently stabilized by landscaping, grass, approved mulch or other permanent soil stabilizing measures.

C. The erosion and sediment control plan shall be reviewed in conjunction with the requested development approval. If the development does not require additional review, the manager may approve or deny the permit with notice of the decision to the applicant.

D. The city may inspect the development site to determine compliance with the erosion and sediment control plan and permit.

E. Erosion that occurs on a development site that does not have an erosion and sediment control permit, or that results from a failure to comply with the terms of such a permit, constitutes a violation of this chapter.

F. If the manager finds that the facilities and techniques approved in an erosion and sediment control plan and permit are not sufficient to prevent erosion, the manager shall notify the owner or his/her designated representative. Upon receiving notice, the owner or his/her designated representative shall immediately install interim erosion and sediment control measures as specified in the city of Oregon City public works standards for erosion and sediment control. Within three days from the date of notice,
the owner or his/her designated representative shall submit a revised erosion and sediment control plan to the city. Upon approval of the revised plan and issuance of an amended permit, the owner or his/her designated representative shall immediately implement the revised plan.

G. Approval of an erosion and sediment control plan does not constitute an approval of permanent road or drainage design (e.g., size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).

17.47.080 Plan implementation.

An approved erosion control and sediment control plan shall be implemented and maintained as follows:

A. Plan approval, where required, shall be obtained prior to clearing or grading. No grading, clearing or excavation of land requiring a plan shall be undertaken prior to approval of the plan.

B. The erosion and sediment control facilities shall be constructed prior to any clearing and grading activities, and maintained in such a manner as to ensure that sediment laden water does not enter the drainage system or violate applicable water standards.

C. The implementation of an erosion and sediment control plan and the construction, maintenance, replacement, and upgrading of erosion and sediment control facilities is the responsibility of the owner or his/her designated representative until all construction is completed and approved, and vegetation, landscaping or approved finished surfaces is established.

D. The erosion and sediment control facilities herein are the minimum requirements for anticipated site

conditions. During the construction period, these erosion and sediment control facilities shall be upgraded as needed for unexpected storm events and to ensure that sediment-laden water does not leave the site.

E. Any observation of visible or measurable erosion, or an observation of more than a ten-percent increase in downstream channel turbidities, will result in an enforcement action by the city.

F. The owner or his/her designated representative shall implement the measures and construct facilities as provided for and according to the implementation schedule in the approved plan. The manager shall be allowed reasonable access to the development site for inspection purposes.

17.47.090 Plan performance guarantee and security.

After the plan is approved by the manager and prior to construction or grading, the owner shall provide a financial guarantee. Erosion and sediment control shall be included in the cost estimate for the primary project, such as land division or site plan, and included in that project's performance guarantee.

17.47.100 Correction of ineffective measures and enforcement.

A. If the owner or his/her designated representative fails to follow the plan as approved by the manager or fails to submit a plan when one is required, the manager may, after inspecting the property, issue a stop work order halting all work on the development site until the requirements of the plan are met or implemented as applicable.
Accompanying the stop work order shall be a written statement or list from the manager specifying what is wrong and what steps the owner must take to bring the development into compliance. The stop work order shall not be lifted until mitigation measures are implemented that comply with Oregon City performance standards for erosion and sediment control and are approved by the manager.

B. If the facilities and techniques in the approved plans are not effective or sufficient to meet the purposes of this chapter, based on an on-site inspection, the Manager may require a revision to the plan. Such requirement shall be in writing and shall explain the problem and suggested measures to remedy the problem. The notice shall be presented to the owner and any other responsible parties.
    1. The revised plan shall be provided within three business days of when written notification by the manager is received. Receipt of such notice shall be deemed complete three days after simultaneous regular mail and certified mail is deposited in the mail.
    2. The owner or his/her designated representative shall implement fully the revised plan within three business days of receipt of the revised plan as provided in the previous subdivision, or within such other time frame as the manager may specify.
    3. In cases where significant erosion is occurring, the manager may require the owner or his/her designated representative to install immediately interim control measures before submittal of revised plan.
    4. If there is a confirmed or imminent threat of significant off-site erosion, the manager shall issue a stop work order, upon issuance of which work on the development site shall halt. The stop work order shall not be lifted until mitigation measures are implemented that comply with Oregon City performance standards for erosion and sediment control and are approved by the manager.

C. Enforcement. Erosion that migrates off of a development site is considered to be a nuisance that threatens the health, safety and welfare of the citizens of Oregon City and is a violation of this chapter. Any owner who violates, or is responsible for a violation or this chapter or an approved plan, shall be subject to the enforcement procedures of this code including by the code enforcement officer.

Oregon City Municipal Code
Chapter 17.48 WRG Willamette River Greenway Overlay District

17.48.010 Designated.

This chapter shall apply to all development, changes of use or intensification of use in that area designated WRG Willamette River Greenway on a special city zoning map.

17.48.020 Purpose.

The purpose of this chapter is to:

A. Protect, conserve, enhance and maintain the natural scenic, historical, agricultural, economic and recreational qualities of land along the Willamette River;
B. Maintain the integrity of the Willamette River by minimizing erosion, promoting bank stability and maintaining and enhancing water quality and fish and wildlife habitats;
C. Implement the Willamette River Greenway goal and the Willamette River Greenway portions of the city comprehensive plan.

17.48.040 Uses allowed.

All uses permitted pursuant to the provisions of the underlying zoning district are permitted on lands designated WRG; provided, however, that any development, change of use or intensification of use shall be subject, in addition to the provisions of the underlying district, to the provisions of this chapter.

17.48.050 Permit required--Exceptions.

A Willamette River Greenway permit shall be required for all developments and changes or intensification of uses, except the following:

A. The propagation of timber or the cutting of timber for public safety or personal use, except the cutting of timber along the natural vegetative fringe along the river;
B. Gravel removal from the bed of the Willamette River when conducted under a permit from the state;
C. Customary dredging and channel maintenance;
D. Placing by a public agency of signs, markers, aids and similar structures to serve the public;
E. Activities to protect, conserve, enhance and maintain public recreation, scenic, historical and natural uses on public lands;
F. Acquisition and maintenance of scenic easements by the Oregon Department of Transportation;
G. Partial harvesting of timber shall be permitted beyond the natural vegetative fringe and those areas not covered by a scenic easement and when the harvest is consistent with an approved plan under the Oregon Forest Practices Act. Commercial forest activities and harvesting practices providing for vegetative buffers, shading, soil stabilization, and water filtering effects required under the Oregon Forest Practices Act;
H. The use of a small cluster of logs for erosion control;
I. The expansion of capacity or the replacement of existing communication or energy distribution and transmission systems, except utility substations;
J. The maintenance and repair of existing flood control facilities;
K. Uses lawfully existing on the effective date of the provisions codified in this chapter;

provided, however, that any change or intensification of use or new development shall require a Willamette River Greenway permit.

17.48.060 Administrative procedure.

Except as specifically provided for in Section 17.48.090, the procedure for action on a Willamette River Greenway permit shall be as provided for under the administrative action provisions in Chapter 17.50. In addition to those provisions, however, notice of a pending Willamette River Greenway permit under Sections 17.48.070 through 17.48.090 or of a compatibility review hearing under Section 17.48.100, shall be given to all persons requesting the same and paying a reasonable fee therefore, as determined by the Community Development Director.

17.48.070 Development standards--Specific use.

In approving any development or change or intensification of use, the approving officer or body shall apply the following standards:
Considerations for Specific Uses.

A. With respect to recreational uses only: the considerations set forth in section C(3)(b) of Goal 15.
B. With respect to those fish and wildlife habitats identified in the city comprehensive plan only: the considerations set forth in section C(3)(d) of Goal 15.
C. With respect to those scenic qualities and views identified in the city comprehensive plan only: the considerations set forth in section C(3)(e) of Goal 15.
D. With respect to timber resources only: the considerations set forth in section C(3)(h) of Goal 15.
E. With respect to aggregate extraction only: the considerations set forth in section C(3)(i) of Goal 15.

17.48.080 Development standards--General considerations.

The following considerations shall be applicable to all Willamette River Greenway permits.

A. Access. Adequate public access to the Willamette River shall be considered and provided for.
B. Protection and Safety. Maintenance of public safety and protection of public and private property, especially from vandalism and trespass, shall be provided for to the maximum extent practicable.
C. Vegetative Fringe. The natural vegetative fringe along the Willamette River shall be protected and enhanced to the maximum extent practicable.
D. Directing Development Away from the River. Development shall be directed away from the Willamette River to the greatest possible degree, provided that lands committed to urban uses within the Greenway may continue as urban uses, subject to the nonconforming use provisions of Chapter 17.58 of this title.
E. A Greenway Setback. In each application, the approving officer or body shall establish a setback to keep structures separated from the Willamette River in order to protect, maintain, preserve and enhance the natural scenic, historic and recreational qualities of the Willamette River Greenway, as set forth in the city comprehensive plan; provided, however, that the requirement to establish such setbacks shall not apply to water-related or water-dependent uses.
F. Other Applicable Standards. The Oregon Department of Transportation Greenway Plan, the Greenway portions of the city comprehensive plan, the Willamette River Greenway statutes and the provisions of Statewide Planning Goal 15, shall also be considered in actions involving Willamette River Greenway permits.

17.48.090 Procedure.

The planning director shall make findings, and may impose reasonable conditions to carry out this chapter, regarding all general, and any applicable specific, considerations of this section. The Community Development Director shall then give notice of a pending Willamette River Greenway permit application, and proposed action thereon, in the manner provided for, and to those persons for whom notice shall be given, under Chapter 17.50 of this code, and to all other interested persons who wish to be notified and who pay a reasonable fee for such notification. If no interested person requests a hearing on such permit application within ten days of giving notice, the application shall be approved, either with or without conditions, or denied, as proposed by the Community Development Director and in accordance with the findings required by this subsection. If there be objection, the matter shall be heard by the planning commission as an administrative action.

17.48.100 Compatibility review.

A. In all areas within one hundred fifty feet of the ordinary low-water line of the Willamette River, hereinafter referred to as the "compatibility boundary," the provisions of this subsection shall be applicable to all developments and changes or intensification of uses, so as to ensure their compatibility with Oregon's Greenway statutes, and to assure that the best possible appearance, landscaping and public access be provided.

B. All development or changes or intensifications of uses in the compatibility area shall be approved only if the following findings be made by the planning commission.
   1. That to the greatest extent possible, the development or change or intensification of use provides for the maximum possible landscaped area, open space or vegetation between the activity and the river.
   2. That to the greatest degree possible, necessary public access is provided to and along the Willamette River by appropriate legal means.

C. Procedure for action on compatibility review shall be as set forth in Section 17.48.060 and shall include application of the relevant use management considerations and requirements provided in Sections 17.48.070 and 17.48.080. The planning commission, after notice and public hearing held pursuant to Chapter 17.50 shall approve issuance, approve issuance with conditions or disapprove issuance of the Willamette River Greenway conditional use permit. The application shall be accompanied by the fee listed in Chapter 17.52 to defray the costs of publication, investigation and processing.

17.48.110 Prohibited activities.

The following are prohibited within the Willamette River Greenway:

A. Any main or accessory residential structure exceeding a height of thirty-five feet;
B. Structural bank protection, except rip rap or a channelization used as an emergency measure only to protect existing structures. Any such rip rap or channelization to stabilize undeveloped sites shall be prohibited as well;
C. Subsurface sewage disposal drainfields within one hundred feet of the ordinary mean low-water line of the Willamette River.

17.48.120 Additional procedural requirements.

In addition to the requirements of Chapter 17.50, the following procedural requirements shall be applicable to all matters arising out of Section 17.48.070 through 17.48.100:

A. Applications submitted for review under Sections 17.48.070 through 17.48.100 shall be

accompanied by such materials as are reasonably necessary for adequate review, including, as necessary:

1. A site and landscaping plan showing existing vegetation and development and location of proposed development for activities;
2. Elevations of any proposed structures;
3. Materials list for any proposed structures, including type and colors of siding and roofing; and
4. Cross-sections of any area within the vegetative fringe where grading, filling, timber harvesting or excavating will occur.

B. 1. Written notice, including a copy of the application, shall be sent immediately upon receipt to the Oregon Department of Transportation by certified mail, return receipt requested. The Oregon Department of Transportation shall have seven working days from the date of mailing to respond before a decision be rendered.

2. Written notice shall be given to the Oregon Department of Transportation by certified mail, return receipt requested, within seven days of the entry of a final order on the disposition of all applications made under Sections 17.48.070 through 17.48.100

Oregon City Municipal Code

Chapter 17.49 - Natural Resource Overlay District

17.49.10 Purpose

This overlay zone designation provides a framework for protection of Metro Titles 3 and 13 lands, and Statewide Planning Goal 5 resources within Oregon City. The Natural Resource Overlay District (NROD) implements the Oregon City Comprehensive Plan Natural Resource Goals and Policies, as well as Federal Clean Water Act requirements for shading of streams and reduction of water temperatures, and the recommendations of the Metro ESEE Analysis. It is intended to resolve conflicts between development and conservation of habitat, stream corridors, wetlands, and floodplains identified in the City's maps. The NROD contributes to the following functional values:

A. Protect and restore streams and riparian areas for their ecologic functions and as an open space amenity for the community.
B. Protect floodplains and wetlands, and restore them for improved hydrology, flood protection, aquifer recharge, and habitat functions.
C. Protect upland habitats, and enhance connections between upland and riparian habitat.
D. Maintain and enhance water quality and control erosion and sedimentation through the revegetation of disturbed sites and by placing limits on construction, impervious surfaces, and pollutant discharges.
E. Conserve scenic, recreational, and educational values of significant natural resources.

The NROD ecological functions listed above are planned for integration with existing neighborhoods and new residential and commercial developments. The long-term goal of the NROD is to restore and enhance stream corridors, wetlands, and forests to more natural vegetated conditions, recognizing that existing homes and other existing uses will continue in the district.

General

17.49.20 How the NROD Works

The NROD protects as one connected system, the habitats and associated functions of the streams, riparian corridors, wetlands and the regulated upland habitats found in Oregon City. These habitats and functions are described in the following documents upon which the NROD is based:

1. The 1999 Oregon City Local Wetland Inventory
2. The Oregon City Water Quality Resource Area Map (Ord. 99-1013)
3. 2004 Oregon City slope data and mapping (LIDAR)
4. Metro Regionally Significant Habitat Map (Aerial Photos taken 2002)
5. National Wetland Inventory (published 1992).
7. Beavercreek Road Concept Plan (adopted September 2008).
8. Park Place Concept Plan (adopted April 2008).

The NROD provisions apply only to properties within the NROD as shown on the NROD Map, as amended.

Properties on the NROD map which are smaller than two acres which are completely surrounded by the NROD shall be included within the NROD and subject to review under

this code.

The NROD provisions do not affect existing uses and development, or the normal maintenance of existing structures, driveways/parking areas, public facilities, farmland and landscaped areas. New public facilities such as recreation trails, planned road and utility line crossings and stormwater facilities, are allowed within the overlay district under prescribed conditions as described in Section 17.49.90. In addition, provisions to allow a limited portion of the NROD to be developed on existing lots of record that are entirely or mostly covered by the NROD ("highly constrained") are described in Section 17.49.120.

17.49.30 Map as Reference
This chapter applies to all development within the Natural Resources Overlay District as shown on the NROD Map, which is a regulatory boundary mapped 10' beyond the required vegetated corridor width specified in section 17.49.110.. The map can only be amended by the City Commission. Verification of the map shall be processed pursuant to Section 17.49.250.

17.49.35 Addition of Wetlands to Map following Adoption
The NROD boundary shall be expanded to include a wetland identified during the course of a development permit review if it is within or partially within the mapped NROD boundary and meets the State of Oregon's definition of a "Locally Significant Wetland". In such cases the entire wetland and its required vegetated corridor as defined in Table 17.49.110 shall be regulated pursuant to the standards of this Chapter. The NROD boundary shall be added to the NROD map by the Community Development Director after the development permit becomes final.

17.49.40 NROD Permit
An NROD permit is required for those uses regulated under Section 17.49.90, Uses Allowed under Prescribed Conditions. An NROD permit shall be processed under the Type II development permit procedure, unless an adjustment of standards pursuant to Section 17.49.87 is requested or the application is being processed in conjunction with a concurrent application or action requiring a Type III or Type IV development permit.

17.49.50 Emergencies
The provisions of this ordinance do not apply to work necessary to protect, repair, maintain, or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies. After the emergency has passed, any disturbed native vegetation areas shall be replanted with similar vegetation found in the Oregon City Native Plant List pursuant to the mitigation standards of Section 17.49.180. For purposes of this section emergency shall mean any man-made or natural event or circumstance causing or Threatening loss of life, injury to person or property, and includes, but is not limited to fire, explosion, flood, severe weather, drought, earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

17.49.60 Consistency and Relationship to Other Regulations

A. Where the provisions of the NROD are less restrictive or conflict with comparable provisions of the Oregon City Municipal Code, other City requirements, regional, state or federal law, the provisions that are more restrictive shall govern.

B. Compliance with Federal and State Requirements.
   a. If the proposed development requires the approval of any other governmental agency,

such as the Division of State Lands or the U.S. Army Corps of Engineers, the applicant shall make application for such approval prior to or simultaneously with the submittal of its development application to the City. The planning division shall coordinate City approvals with those of other agencies to the extent necessary and feasible. Any permit issued by the City pursuant to this chapter shall not become valid until other agency approvals have been obtained or those agencies indicate that such approvals are not required.

b. The requirements of this chapter apply only to areas within the NROD and to locally significant wetlands that may be added to the boundary during the course of development review pursuant to Section 17.49.035. If, in the course of a development review, evidence suggests that a property outside the NROD may contain a wetland or other protected water resource, the provisions of this chapter shall not be applied to that development review. However, the omission shall not excuse the applicant from satisfying any state and federal wetland requirements which are otherwise applicable. Those requirements apply in addition to, and apart from the requirements of the City's comprehensive plan and this code.

Prohibited, Exempted and Regulated Uses

17.49.70 Prohibited Uses

The following development and activities are not allowed within the NROD:

A. Any new gardens, lawns, structures, development, other than those allowed outright (exempted) by the NROD or that is part of a regulated use that is approved under prescribed conditions. Note: Gardens and lawns within the NROD that existed prior to the time the overlay district was applied to a subject property are allowed to continue but cannot expand further into the overlay district.

B. New lots that would have their buildable areas for new development within the NROD are prohibited.

C. The dumping of materials of any kind is prohibited except for placement of fill as provided in (D) below. The outside storage of materials of any kind is prohibited unless they existed before the overlay district was applied to a subject property. Uncontained areas of hazardous materials as defined by the Oregon Department of Environmental Quality (ORS 466.005) are also prohibited.

D., Grading, the placement of fill in amounts greater than ten cubic yards, or the removal of native vegetation within the NROD is prohibited, unless part of an approved development activity.

17.49.80 Uses Allowed Outright (Exempted)

The following uses are allowed within the NROD and do not require the issuance of an NROD permit:

A. Stream, wetland, riparian, and upland restoration or enhancement projects as authorized by the City.

B. Farming practices as defined in ORS 215.203 and farm uses, excluding buildings and structures, as defined in ORS 215.203.

C. Utility service using a single utility pole or where no more than 100 square feet of ground surface is disturbed outside of the top-of-bank of water bodies and where the disturbed area is restored to the pre-construction conditions.

D. Boundary and topographic surveys leaving no cut scars greater than three inches in diameter on live parts of native plants listed in the Oregon City Native Plant List.

E. Soil tests performed with hand-held equipment, provided that excavations do not exceed a depth of five feet, combined diameters of all excavations do not exceed five feet, and all excavations are refilled with native soil, except as necessary for environmental review.

F. Trails meeting all of the following:

1. Construction shall take place between May 1 and October 30 with hand held equipment;
2. Widths shall not exceed 48 inches and trail grade shall not exceed 20 percent;
3. Construction shall leave no scars greater than three inches in diameter on live parts of native plants;
4. Located no closer than 25 feet to a wetland or the top of banks of water bodies;
5. No impervious surfaces; and
6. No native trees greater than one (1) inch in diameter may be removed or cut, unless replaced with an equal number of native trees of at least 3-inch diameter and planted within 10 feet of the trail.

G. Land divisions provided they meet the following standards, and indicate the following on the final plat:

1. Lots shall have their building sites (or buildable areas) entirely located at least 5 feet from the NROD boundary. For the purpose of this subparagraph, "building site" means an area of at least 3,500 square feet with minimum dimensions of 40 feet wide by 40 feet deep;
2. All public and private utilities (including water lines, sewer lines or drain fields, and stormwater disposal facilities) where none of these utilities are in the NROD;
3. Streets, driveways and parking areas where all pavement shall be located at least 10 feet from the NROD; and
4. The NROD portions of all lots are protected by a conservation easement; or
5. A lot or tract created and dedicated solely for unimproved open space or conservation purposes.

H. Routine repair and maintenance of existing structures, roadways, driveways and utilities.

I. Replacement, additions, alterations and rehabilitation of existing structures, roadways, utilities, etc., where the ground level impervious surface area is not increased.

J. Measures mandated by the City of Oregon City to remove or abate nuisances or hazardous conditions.

K. Planting of native vegetation and the removal of non-native, invasive vegetation (as identified on the Oregon City Native Plant List), and removal of refuse and fill, provided that:

1. All work is done using hand-held equipment;
2. No existing native vegetation is disturbed or removed; and
3. All work occurs outside of wetlands and the tops-of-bank of streams.

17.49.90 Uses Allowed Under Prescribed Conditions

The following uses within the NROD are subject to the applicable standards listed in Sections 17.49.100 through 17.49.190 pursuant to a Type II process:

A. Alteration to existing structures within the NROD when not exempted by Section 17.49.80, subject to Section 17.49.130.

B. A residence on a highly constrained vacant lot of record that has less than 5,000 square feet of buildable area, with minimum dimensions of 50 feet by 50 feet, remaining outside the NROD portion of the property, subject to the maximum disturbance allowance prescribed in subsection 17.49.120.A.

C. A land division that would create a new lot for an existing residence currently within the NROD, subject to Section 17.49.160.

D. Trails/pedestrian paths when not exempted by Section 17.49.80, subject to Section 17.49.170 (for trails) or Section 17.49.150 (for paved pedestrian paths).
E. New roadways, bridges/creek crossings, utilities or alterations to such facilities when not exempted by Section 17.49.80, subject to Section 17.49.150 (for roads, bridges/creek crossings) or Section 17.49.140 (for utility lines) or Section 17.49.100 (for stormwater detention or pre-treatment facilities).
F. Institutional, Industrial or Commercial development on a vacant lot of record situated in an area designated for such use that has more than 75% of its area covered by the NROD, subject to subsection 17.49.120(B).
G. City, county and state capital improvement projects, including sanitary sewer, water and storm water facilities, water stations, and parks and recreation projects.

Development Standards

17.49.100 General Development Standards

The following standards apply to all Uses Allowed under Prescribed Conditions within the NROD with the exception of rights of ways (subject to Section 17.49.150), trails (subject to Section 17.49.170), utility lines (subject to Section 17.49.140), land divisions (subject to Section 17.49.160), and mitigation projects (subject to Section 17.49.180 or 17.49.190):

A. Native trees may be removed only if they occur within 10 feet of any proposed structures or within 5 feet of new driveways or if deemed not wind-safe by a certified arborist. Trees listed on the Oregon City Nuisance Plant List or Prohibited Plant List are exempt from this standard and may be removed. A protective covenant shall be required for any native trees that remain;
B. The Community Development Director may allow the landscaping requirements of the base zone, other than landscaping required for parking lots, to be met by preserving, restoring and permanently protecting habitat on development sites in the Natural Resource Overlay District.
C. All vegetation planted in the NROD shall be native and listed on the Oregon City Native Plant List;
D. Grading is subject to installation of erosion control measures required by the City of Oregon;
E. The minimum front, street, or garage setbacks of the base zone may be reduced to any distance between the base zone minimum and zero in order to minimize the disturbance area within the NROD portion of the lot;
F. Any maximum required setback in any zone, such as for multi-family, commercial or institutional development, may be increased to any distance between the maximum and the distance necessary to minimize the disturbance area within the NROD portion of the lot;
G. Fences are allowed only within the disturbance area;
H. Incandescent lights exceeding 200 watts (or other light types exceeding the brightness of a 200 watt incandescent light) shall be placed or shielded so that they do not shine directly into resource areas;
I. If development will occur within the 100 yr. floodplain, the FEMA floodplain standards of Chapter 17.42 shall be met; and
J. Mitigation is required, subject to Section 17.49.180 or 17.49.190.

17.49.110 Width of Vegetated Corridor

A. Calculation of Vegetated Corridor Width within City Limits. The NROD consists of a vegetated corridor measured from the top of bank or edge of a protected habitat or water feature. The minimum required width is the amount of buffer required on each side of a stream, or on all sides of a feature if non-linear. The width of the vegetated corridor necessary to adequately protect the habitat or water feature is specified in Table 17.49.110.

Table 17.49.110

Protected Feature Type (See Definitions)	Anadromous Fish-bearing Stream	All Other Features			
		Intermittent Stream < 25%, drains < 100 acres	All Other Streams (Intermittent or Perennial)		Delineated Wetland
Minimum Required Width	200'	15'	50'	200'	50'
Slope Adjacent to Feature	Any	< 25 %	> 25 % for less than 150 feet (see Note 2)	> 25 % for 150 feet or more (see Note 2)	Any
Starting Point for Measurements from Feature	Top of Bank	Top of Bank	Top of Bank	Top of bank to break in > 25 % slope (See Note 3) + 50'	Delineated Edge of Title 3 Wetland
Maximum Disturbance Allowance	See Section 17.49.120				
Mitigation Requirements	See Section17.49.180 or 17.49.190				

Notes:

1. Vegetated corridors in excess of fifty feet apply on steep slopes only in the uphill direction from the protected water feature.
2. Where the protected water feature is confined by a ravine or gully, the top of the ravine is the break in the ≥ 25 percent slope.

B. Habitat Areas within City Parks. For habitat and water features identified by Metro as regionally significant which are located within city parks, the NROD Boundary shall correspond to the Metro Regionally Significant Habitat Map.

C. Habitat Areas outside city limit / within UGB. For habitat and water features identified by Metro as regionally significant which are located outside of the city limits as of the date of adoption of this ordinance, the minimum corridor width from any non-anadramous fish bearing stream or wetland shall be fifty feet (50').

17.49.120 Maximum Disturbance Allowance for Highly Constrained Lots of Record

In addition to the General Development Standards of Section 17.49.100, the following standards apply to a vacant lot of record that is highly constrained by the NROD, per subsections 17.49.90(B) and 17.49.90(F):

A. Standard for Residential Development. In the NROD where the underlying zone district is zoned Residential (R-10, R-8, R-6, R-5, R-3.5): the maximum disturbance area allowed for new residential development within the NROD area of the lot is 2,500 square feet.

B. Standard for all developments not located in R-10, R-8, R-6, R-5, and R-3.5. For all other underlying zone districts, including R-2 multifamily, the maximum disturbance area allowed for a vacant, constrained lot of record development within the NROD is that square footage which when added to the square footage of the lot lying outside the NROD portion equals 25% of the total lot area.

[1] Lots that are entirely covered by the NROD will be allowed to develop 25% of their area.

[1] Note: This can be determined by (1) Multiplying the total square footage of the lot by .25; (2) Subtracting from that amount the square footage of the lot that is located outside the NROD; (3) The result is the maximum square footage of disturbance to be allowed in the NROD portion of the lot. If the result is < or = to 0, no disturbance is permitted and the building shall be located outside of the boundary.

C. In all areas of Oregon City, the disturbance area of a vacant, highly constrained lot of record within the NROD shall be set back at least 100 feet from the top of bank on Abernethy Creek, Newell Creek, or Livesay Creek or 50 feet from the top of bank of any tributary of the afore-mentioned Creeks, other water body, or from the delineated edge of a wetland located within the NROD area.

17.49.130 Existing Development Standards

In addition to the General Development Standards of Section 17.49.100, the following standards apply to alterations of existing development within the NROD, except for trails, rights of way, utility lines, land divisions and mitigation projects:

A. One of the following shall be met:
1. The disturbance area shall not exceed 2,500 square feet of subsection 17.49.120 and the disturbance area shall not be expanded toward the protected feature; or
2. If the existing disturbance area now exceed 2,500 square feet, a permanent disturbance area shall be delineated that includes all existing buildings, parking and loading areas, paved or graveled areas, patios and decks, and contains the proposed development. The same delineated disturbance area shall be shown on every subsequent proposal for alterations meeting this standard.

B. The proposed development shall be set back at least 25 feet from the top-of-bank of any stream, waterbody, or from the delineated edge of any wetland located within the NROD area.

17.49.140 Standards for Utility Lines

The following standards apply to new utilities, private connections to existing or new utility lines, and upgrades of existing utility lines within the NROD:

A. The disturbance area for private connections to utility lines shall be no greater than 10 feet wide;
B. The disturbance area for the upgrade of existing utility lines shall be no greater than 15 feet wide;
C. New utility lines shall be within the right-of-way.
D. No fill or excavation is allowed within the ordinary high water mark of a stream;
E. The Division of State Lands must approve any work that requires excavation or fill in a wetland;
F. Native trees more than 10 inches in diameter shall not be removed unless it is shown that there

are no feasible alternatives; and

G. Each 6 to 10-inch diameter native tree cut shall be replaced at a ratio of three trees for each one removed. Each 11-inch or greater diameter native tree shall be replaced at a ratio of five trees for each removed. The replacement trees shall be a minimum one-half inch diameter and selected from the Oregon City Native Plant List. All trees shall be planted on the applicant's site. Where a utility line is approximately parallel with the stream channel, at least half of the replacement trees shall be planted between the utility line and the stream channel.

H. Mitigation is required, subject to Section 17.49.180 or 17.49.190.

17.49.150 Standards for Rights of Ways

The following standards apply to public rights of way within the NROD, including roads, bridges/stream crossings and pedestrian paths with impervious surfaces:

A. Stream crossings shall be limited to the minimum number necessary to ensure safe and convenient pedestrian, bicycle and vehicle connectivity, and shall cross the stream at an angle as close to perpendicular to the stream channel as practicable. Bridges shall be used instead of culverts wherever practicable.

B. Where the right-of-way crosses a stream the crossing shall be by bridge or a bottomless culvert;

C. No fill or excavation shall occur within the ordinary high water mark of a stream;

D. If the Oregon Department of State Lands (DSL) has jurisdiction over any work that requires excavation or fill in a wetland, required permits or authorization shall be obtained from DSL prior to release of a grading permit;

E. Any work that will take place within the banks of a stream shall be conducted between June 1 and August 31, or shall be approved by the Oregon Department of Fish and Wildlife; and

F. Mitigation is required, subject to Section 17.49.180 or 17.49.190.

17.49.155 Standards for Stormwater Facilities

Approved facilities that infiltrate stormwater on-site in accordance with Public Works Low-Impact Development standards, including but not limited to; vegetated swales, rain gardens, vegetated filter strips, and vegetated infiltration basins, and their associated piping, may be placed within the NROD boundary pursuant to the following standards:

A. The forest canopy within the driplines of existing trees shall not be disturbed.

B. Only vegetation from the Oregon City Native Plant List shall be planted within these facilities.

C. Mitigation is required, subject to Section 17.49.180 or 17.49.190.

D. The Community Development Director may allow landscaping requirements of the base zone, other than landscaping required for parking lots, to be met by preserving, restoring and permanently protecting habitat on development sites within the Natural Resource Overlay District.

17.49.160 Standards for Land Divisions

Other than those land divisions exempted by Section 17.49.70 (G), the only type of lot allowed within the NROD is a lot created for a residence that existed before the NROD was applied to a subject property. A new lot for an existing house may be created when all of the following are met:

A. There is an existing house on the site that is entirely within the NROD area; and

B. The existing house will remain; and

C. The new lot is no larger than required to contain the house, minimum required side setbacks, garage, driveway and a 20-foot deep rear yard, with the remaining NROD area beyond that point protected by a conservation easement, or by dedicating a conservation tract or public open space.

17.49.170 Standards for Trails

The following standards apply to trails within the NROD:

A. All trails that are not exempt pursuant to Section 17.49.76(F), shall be setback at least 50 feet from the tops of banks of streams or the delineated boundary of a wetland, except as designated in the Oregon City Parks, Open Space and Trails Master Plans; and
B. Mitigation is required, subject to Section 17.49.180 or 17.49.190.

17.49.180 Mitigation Standards

The following standards (or the alternative standards of Section 17.49.190) apply to required mitigation:

A. Mitigation shall occur at a 2:1 ratio of mitigation area to proposed disturbance area;
B. Mitigation shall occur on the site where the disturbance occurs, except as follows:
   1. The mitigation is required for disturbance associated with a right-of-way or utility in the right-of-way;
   2. The mitigation shall occur first on the same stream tributary, secondly in the Abernethy, Newell or Livesay Creek or a tributary thereof, or thirdly as close to the impact area as possible within the NROD; and
   3. An easement that allows access to the mitigation site for monitoring and maintenance shall be provided as part of tbe mitigation plan.
C. Mitigation shall occur within the NROD area of a site unless it is demonstrated that this is not feasible because of a lack of available and appropriate area. In such cases, the proposed mitigation area shall be contiguous to the existing NROD area so the NROD boundary can be easily extended in the future to include the new resource site.
D. Invasive and nuisance vegetation shall be removed within the mitigation area;
E. Required Mitigation Planting. An applicant shall meet Mitigation Planting Option 1 or 2 below, whichever option results in more tree plantings, except that where the disturbance area is one acre or more, Mitigation Option 2 shall be required. All trees, shrubs and ground cover shall be selected from the Oregon City Native Plant List.

NOTE: Applications on sites where no trees are present or which are predominantly covered with invasive species shall be required to mitigate the site, remove the invasive species and plant trees and native plants pursuant to Option 2.

1. Mitigation Planting Option 1.
   a. Option 1 - Planting Quantity. This option requires mitigation planting based on the number and size of trees that are removed from the site pursuant to Table __. Conifers shall be replaced with conifers. Bare ground shall be planted or seeded with native grasses and ground cover species.

Table 17.49.180(E)(1)(a) – Required Planting Option 1

Size of Tree to be Removed (DBH)	**Number of Trees and Shrubs to be Replanted**

6 to 12"	2 trees and 3 shrubs
13 to 18"	3 trees and 6 shrubs
19 to 24"	5 trees and 12 shrubs
25 to 30"	7 trees and 18 shrubs
Over 30"	10 rees and 30 shrubs

b. Option 1 - Plant Size. Replacement trees shall be at least one-half inch in caliper on average, measured at 6 inches above the ground level for field grown trees or above the soil line for container grown trees. Oak, madrone, ash or alder may be one gallon size. Conifers shall be a minimum of six (6') in beight. Shrubs must be in at least 1-gallon container size or the equivalent in ball and burlap, and shall be at least 12 inches in height at the time of planting. All other species shall be a minimum of four-inch pots;

c. Option 1 - Plant Spacing. Except for the outer edges of mitigation areas, trees and shrubs shall be planted in a non-linear fashion. Plant spacing for new species shall be measured from the driplines of existing trees when present. Trees shall be planted on average between 8 and 12 feet on center, and shrubs shall be planted on average between 4 and 5 feet on center, or clustered in single species groups of no more than four (4) plants, with each cluster planted on average between 8 and 10 feet on center.

d. Option 1 - Mulching and Irrigation. Mulch new plantings a minimum of three inches in depth and 18 inches in diamters. Water new plantings one inch per week from June 30th to September 15th, for the three years following planting.

e. Option 1 – Plant Diversity. Shrubs shall consist of at least two (2) different species. If 10 trees or more are planted, no more than one-half of the trees may be of the same genus.

2. Mitigation Planting Option 2.

a. Option 2 - Planting Quantity. In this option the required number of plantings is calculated based on the size of the disturbance area within the NROD. The ratio of native trees and shrubs to be planted is 820 trees and 820 shrubs per acre for every acre of HCA disturbance. This amount shall be adjusted for smaller disturbance areas. For example, 410 trees and 410 shrubs shall be planted per acre for every half-acre of HCA disturbance. Bare ground shall be planted or seeded with native grasses and ground cover species.

b. Option 2 - Plant Size. Plantings may vary in size dependent on whether they are live cuttings, bare root stock or container stock, however, no initials plantings may be shorter than 12 inches in height.

c. Option 2 - Plant Spacing. Trees shall be planted at average intervals of seven (7) feet on center. Shrubs may be planted in single-species groups of no more than four (4) plants, with clusters planted on average between 8 and 10 feet on center.

d. Option 2 – Mulching and Irrigation shall be applied in the amounts necessary to ensure 80% survival at the end of the required 5-year monitoring period.

e. Option 2 – Plant Diversity. Shrubs shall consist of at least three (3) different species. If 20 trees or more are planted, no more than one-third of the trees may be of the same genus.

An alternative planting plan using native plants may be approved in order to create a new wetland area, if it is part of a wetlands mitigation plan that has been approved by the DSL or the U.S. Army Corps of Engineers (USACE) in conjunction with a wetland joint removal/fill permit application.

F. Monitoring and Maintenance. The mitigation plan shall provide for a 5-year monitoring and

maintenance plan with annual reports in a form approved by the Director of Community Development. Monitoring of the mitigation site is the on-going responsibility of the property owner, assign, or designee, who shall submit said annual report to the City's Planning Division, documenting plant survival rates of shrubs and trees on the mitigation site. Photographs shall accompany the report that indicate the progress of the mitigation. A minimum of 80% survival of trees and shrubs of those species planted is required at the end of the 5-year maintenance and monitoring period. Any invasive species shall be removed and plants that die shall be replaced in kind. Bare spots and areas of invasive vegetation larger than ten (10) square feet that remain at the end the 5 year monitoring period shall be replanted or reseeded with native grasses and ground cover species.

G. Covenant or Conservation Easement. Applicant shall record a restrictive covenant or conservation easement, in a form provided by the City, requiring the owners and assigns of properties subject to this section to comply with the applicable mitigation requirements of this section. Said covenant shall run with the land, and permit the City to complete mitigation work in the event of default by the responsible party. Costs borne by the City for such mitigation shall be borne by the owner.

H. Financial Guarantee. A financial guarantee for establishment of the mitigation area, in a form approved by the City, shall be submitted before development within the NROD disturbance area commences. The City will release the guarantee at the end of the five-year monitoring period, or before, upon it's determination that the mitigation plan has been satisfactorily implemented pursuant to this section.

17.49.190 Alternative Mitigation Standards

In lieu of the above mitigation standards of Section 17.49.180, the following standards may be used. Compliance with these standards shall be demonstrated in a mitigation plan report prepared by an environmental professional with experience and academic credentials in one or more natural resource areas such as ecology, wildlife biology, botany, hydrology or forestry. At the applicant's expense, the City may require the report to be reviewed by an environmental consultant.

A. The proposed mitigation shall occur at a minimum 2:1 ratio of mitigation area to proposed disturbance area;

B. The proposed mitigation shall result in a significant improvement of at least one functional value listed in section 17.49.10, as determined by a qualified environmental professional;

C. There shall be no detrimental impact on resources and functional values in the area designated to be left undisturbed;

D. Where the proposed mitigation includes alteration or replacement of development in a stream channel, wetland, or other water body, there shall be no detrimental impact related to the migration, rearing, feeding or spawning of fish;

E. Mitigation shall occur on the site of the disturbance to the extent practicable. If the proposed mitigation cannot practically occur on the site of the disturbance, then the applicant shall possess a legal instrument, such as an easement, sufficient to carryout and ensure the success of the mitigation.

17.49.200 Adjustment from Standards

If a regulated NROD use listed in Section 17.49.90 cannot meet one or more of the applicable NROD standards then an adjustment may be issued if all of the following criteria are met. Compliance with these criteria shall be demonstrated by the applicant in a written report prepared by an environmental professional with experience and academic credentials in one or more

natural resource areas such as ecology, wildlife biology, botany, hydrology or forestry. At the applicant's expense, the City may require the report to be reviewed by an environmental consultant. Such requests shall be processed under the Type III development permit procedure. The applicant shall demonstrate:

A. There are no feasible alternatives for the proposed use or activity to be located outside the NROD area or to be located inside the NROD area and to be designed in a way that will meet all of the applicable NR-SW development standards;
B. The proposal has fewer adverse impacts on significant resources and resource functions found in the local NROD area than actions that would meet the applicable environmental development standards;
C. The proposed use or activity proposes the minimum intrusion into the NROD area that is necessary to meet development objectives;
D. Fish and wildlife passage will not be impeded; and
E. With the exception of the standard(s) subject to the adjustment request, all other applicable NROD standards can be met.

Application Requirements

17.49.210 Type II Development Permit Application

Unless otherwise directed by the NROD standards, proposed development within the NROD shall be processed as a Type II development permit application. All applications shall include the items required for a complete application by Sections 17.49.220-230, and Section 17.50.080 of the Oregon City Municipal Code as well as a discussion of how the proposal meets all of the applicable NROD development standards 17.49.100-170.

17.49.220 Required Site Plans

Site plans showing the following required items shall be part of the application:

A. For the entire subject property (NROD and non-NROD areas):
   1. The NROD district boundary. This may be scaled in relation to property lines from the NROD Map;
   2. 100 year floodplain and floodway boundary (if determined by FEMA);
   3. Creeks and other waterbodies;
   4. Any wetlands, with the boundary of the wetland that will be adjacent to the proposed development determined in a wetlands delineation report prepared by a professional wetland specialist and following the Oregon Division of State Lands wetlands delineation procedures;
   5. Topography shown by contour lines of 2 or 1 foot intervals for slopes less than 15% and by 10 foot intervals for slopes 15% or greater;
   6. Existing improvements such as structures or buildings, utility lines, fences, driveways, parking areas, etc.
   7. Extent of the required Vegetated Corridor required by Table 17.49.110.
B. Within the NROD area of the subject property:
   1. The distribution outline of shrubs and ground covers, with a list of most abundant species;
   2. Trees 6 inches or greater in diameter, identified by species. When trees are located in clusters they may be described by the approximate number of trees, the diameter range, and a listing of dominant species;
   3. An outline of the disturbance area that identifies the vegetation that will be removed. All

trees to be removed with a diameter of 6 inches or greater shall be specifically identified as to number, trunk diameters and species;

4. If grading will occur within the NROD, a grading plan showing the proposed alteration of the ground at 2 foot vertical contours in areas of slopes less than 15% and at 5 foot vertical contours of slopes 15% or greater.

C. A construction management plan including:
   1. Location of site access and egress that construction equipment will use;
   2. Equipment and material staging and stockpile areas;
   3. Erosion control measures that conform to City of Oregon City erosion control standards;
   4. Measures to protect trees and other vegetation located outside the disturbance area.

D. A mitigation site plan demonstrating compliance with Section 17.49.180 or 17.49.190, including:
   1. Dams, weirs or other in-water features;
   2. Distribution, species composition, and percent cover of ground covers to be planted or seeded;
   3. Distribution, species composition, size, and spacing of shrubs to be planted;
   4. Location, species and size of each tree to be planted;
   5. Stormwater management features, including retention, infiltration, detention, discharges and outfalls;
   6. Water bodies or wetlands to be created, including depth;
   7. Water sources to be used for irrigation of plantings or for a water source for a proposed wetland.

17.49.230 Mitigation Plan Report

A mitigation plan report that accompanies the above mitigation site plan is also required. The report shall be prepared by an environmental professional with experience and academic credentials in one or more natural resource areas such as ecology, wildlife biology, botany, hydrology or forestry. The mitigation plan report shall, at a minimum, discuss:

A. Written responses to each applicable Mitigation Standard 17.49.180 or 17.49.190 indicating how the proposed development complies with the mitigation standards;

B. The resources and functional values to be restored, created, or enhanced through the mitigation plan;

C. Documentation of coordination with appropriate local, regional, state and federal regulatory/resource agencies such as the Oregon Department of State Lands (DSL) and the United States Army Corps of Engineers (USACE);

D. Construction timetables;

E. Monitoring and Maintenance practices pursuant to Section 17.49.230 (F) and a contingency plan for undertaking remedial actions that might be needed to correct unsuccessful mitigation actions during the first 5 years of the mitigation area establishment.

Miscellaneous

17.49.240 Density Transfer

The NROD allocates urban densities to the non-NROD portions of properties located partially within the NROD, generally resulting in a substantial increase in net development potential. For lots of record that are located within the NROD, additional density transfer credits are allowed, subject to the following provisions:

A. Density may be transferred from the NROD to non-NROD portions of the same property or of contiguous properties within the same development site;
B. The residential transfer credit shall be as follows: 1/3 of the gross density of the underlying zone district within the NROD tract is permitted to be transferred to the net developable area outside of the tract within the boundary of the development site.
C. For transfers to the Mixed Use Commercial (MUC-2), Mixed Use Employment (MUE) Employment, or Mixed Use Downtown (MUD), the transfer credit is 10,000 sq. ft. (FAR) per acre of land within the NROD;
D. The area of land contained in the NROD area may be excluded from the calculations for determining compliance with minimum density requirements of the land division code.
E. The owner of the transferring property shall execute a covenant with the City that records the transfer of units. The covenant shall be found to meet the requirements of this section and be recorded before building permits are issued; and
F. All other applicable development standards, including setbacks and building heights, shall continue to apply when a density transfer occurs.

17.49.250 Verification of NROD Boundary

The NROD boundary may have to be verified occasionally to determine the true location of a resource and its functional values on a site. This may through a site specific environmental survey or, in those cases where existing information demonstrates that the NROD significance rating does not apply to a site-specific area. Applications for development on a site located in the NROD area may request a determination that the subject site is not in an NROD area and therefore is not subject to the standards of Section 17.49.100. Verifications shall be processed as either a Type I or Type II process.

17.49.255 Type I Verification.

A. Applicants for a determination under this section shall submit a site plan meeting the requirements of 17.49.220, as applicable.
B. Alternatively, an applicant may request a Type I Verification determination by the Community Development Director by making an application therefore and paying to the City a fee as set by resolution of the City Commission. Such requests may be approved provided that there is evidence substantiating that all the requirements of this chapter relative to the proposed use are satisfied and demonstrates that the property also satisfies the following criteria, as applicable:
    1. No soil, vegetation, hydrologic features have been disturbed;
    2. No hydrologic features have been changed;
    3. There are no man-made drainage features, water marks, swash lines, drift lines present on trees or shrubs, sediment deposits on plants, or any other evidence of sustained inundation.
    4. The property does not contain a wetland as identified by the City's local wetland inventory or water quality and flood management areas map.
    5. There is no evidence of a perennial or intermittent stream system or other protected water feature. This does not include established irrigation ditches currently under active farm use, canals or manmade storm or surface water runoff structures or artificial water collection devices.
    6. Evidence of prior land use approvals that conform to the City's existing Water Quality Resource Area Overlay District.
    There is an existing physical barrier between the site and a protected water feature, including:

a. streets, driveways, alleys, parking lots or other approved impervious areas wider than 15 feet and which includes drainage improvements that are connected to the City storm sewer system, as approved by the City.
b. Walls, buildings, drainages, culverts or other structures and which form a physical barrier between the site and the protected water features, as approved by the City.

C. If a the City is not able to clearly determine, through the Type I verification process that the applicable criteria (B)1-6 above are met the verification application shall be denied. An applicant may then opt to apply for an verification through the Type II process defined below.

17.49.260. Type II Verification

Verifications of the NROD which cannot be determined pursuant to the standards of 17.49.255may be processed under the Type II permit procedure.

A. Applicants for a determination under this section shall submit a site plan meeting the requirements of 17.49.220 as applicable.
B. Such requests may be approved provided that there is evidence that demonstrates in an environmental report prepared by one or more qualified professionals with experience and credentials in natural resource areas, including wildlife biology, ecology, hydrology and forestry, that a resource function(s) and/or land feature(s) does not apply to a site-specific area. (C) Verification to remove a recently developed area from the NROD shall show that all of the following have been met:
1. All approved development in the NROD has been completed;
2. All mitigation required for the approved development, located within the NROD, has been successful; and
3. The previously identified resources and functional values on the developed site no longer exist or have been subject to a significant detrimental impact.

17.49.265 Corrections to Violations

For correcting violations, the violator shall submit a remediation plan that meets all of the applicable standards of the NROD. The remediation plan shall be prepared by one or more qualified professionals with experience and credentials in natural resource areas, including wildlife biology, ecology, hydrology and forestry. If one or more of these standards cannot be met then the applicant's remediation plan shall demonstrate that there will be:

A. No permanent loss of any type of resource or functional value listed in section 17.49.10, as determined by a qualified environmental professional;
B. A significant improvement of at least one functional value listed in section 17.49.10, as determined by a qualified environmental professional; and
C. There will be minimal loss of resources and functional values during the remediation action until it is fully established.

Oregon City Municipal Code
Chapter 17.50 Administration and Procedures

17.50.010 Purpose.

This chapter provides the procedures by which Oregon City reviews and decides upon applications for all permits relating to the use of land authorized by ORS Chapters 92, 197 and 227. These permits include all form of land divisions, land use, limited land use and expedited land division and legislative enactments and amendments to the Oregon City comprehensive plan and Titles 16 and 17 of this code. Pursuant to ORS 227.175, any applicant may elect to consolidate applications for two or more related permits needed for a single development project. Any grading activity associated with development shall be subject to preliminary review as part of the review process for the underlying development. It is the express policy of the City that development review not be segmented into discrete parts in a manner that precludes a comprehensive review of the entire development and its cumulative impacts.

17.50.030 Summary of the City's Decision-Making Processes.

The following decision-making processes chart shall control the City's review of the indicated permits:

Table 17.50.030
PERMIT APPROVAL PROCESS

PERMIT TYPE	I	II	III	IV	Expedited Land Division
Compatibility Review	X				
Code Interpretation			X		
General Development Plan			X		
Conditional Use			X		
Detailed Development Plan[1]		X	X		
Extension		X			
Final Plat	X				
Geologic Hazards		X			
Historic Review			X		
Lot Line Adjustment and Abandonment	X				
Major Modification to a Prior Approval[2]	X	X	X	X	X
Minor Modification to a prior Approval	X				
Minor Partition		X			
Nonconforming Use, Structure and Lots Review	X	X			
Reconsideration	X				

[1] If any provision or element of the master plan requires a deferred Type III procedure, the detailed development plan shall be processed through a Type III procedure.
[2] A major modification to a prior approval shall be considered using the same process as would be applicable to the initial approval.

Revocation				X	
Site Plan and Design Review		X			
Subdivision		X			X
Variance		X	X		
Zone Change & Plan Amendment				X	
Zone Change Upon Annexation with No Discretion	X			X	
Zone Change Upon Annexation with Discretion				X	
Natural Resource Exemption	X				
Natural Resource Review		X			

A. Type I decisions do not require interpretation or the exercise of policy or legal judgment in evaluating approval criteria. . Because no discretion is involved, Type I decisions do not qualify as a land use, or limited land use, decision. The decision-making process requires no notice to any party other than the applicant. The Community Development Director's decision is final and not appealable by any party through the normal City land use process.

B. Type II decisions involve the exercise of limited interpretation and discretion in evaluating approval criteria, similar to the limited land use decision-making process under state law. Applications evaluated through this process are assumed to be allowable in the underlying zone, and the inquiry typically focuses on what form the use will take or how it will look. Notice of application and an invitation to comment is mailed to the applicant, recognized active neighborhood association(s) and property owners within three hundred feet. The Community Development Director accepts comments for a minimum of fourteen days and renders a decision. The Community Development Director's decision is appealable to the City Commission with notice to the Planning Commission, by any party with standing (i.e., applicant and any party who submitted comments during the commentperiod). The City Commission decision is the City's final decision and is appealable to the Land Use Board of Appeals (LUBA) within twenty-one days of when it becomes final.

C. Type III decisions involve the greatest amount of discretion and evaluation of subjective approval standards, yet are not required to be heard by the City Commission, except upon appeal. In the event that any decision is not classified, it shall be treated as a Type III decision. The process for these land use decisions is controlled by ORS 197.763. Notice of the application and the Planning Commission or the Historic Review Board hearing is published and mailed to the applicant, recognized neighborhood association(s) and property owners within three hundred feet. Notice must be issued at least twenty days pre-hearing, and the staff report must be available at least seven days pre-hearing. At the evidentiary hearing held before the Planning Commission or the Historic Review Board, all issues are addressed. The decision of the Planning Commission or Historic Review Board is appealable to the City Commission, on the record. The City Commission decision on appeal from the Historic Review Board or the Planning Commission is the City's final decision and is appealable to LUBA within twenty-one days of when it becomes final.

D. Type IV decisions include only quasi-judicial plan amendments and zone changes. These applications involve the greatest amount of discretion and evaluation of subjective approval standards and must be heard by the City Commission for final action. The process for these land use decisions is controlled by ORS 197.763. Notice of the application and Planning Commission hearing is published and mailed to the applicant, recognized neighborhood association(s) and property owners within three hundred feet. Notice must be issued at least twenty days pre-hearing, and the staff report must be available at least seven days pre-hearing. At the evidentiary hearing held before the Planning Commission, all issues are addressed. If the Planning Commission denies the application, any party with standing (i.e.,

anyone who appeared before the Planning Commission either in person or in writing within the comment period) may appeal the Planning Commission denial to the City Commission. If the Planning Commission denies the application and no appeal has been received within ten days of the issuance of the final decision then the action of the Planning Commission becomes the final decision of the City. If the Planning Commission votes to approve the application, that decision is forwarded as a recommendation to the City Commission for final consideration. In either case, any review by the City Commission is on the record and only issues raised before the Planning Commission may be raised before the City Commission. The City Commission decision is the City's final decision and is appealable to the Land Use Board of Appeals (LUBA) within twenty-one days of when it becomes final.

E. The expedited land division (ELD) process is set forth in ORS 197.360 to 197.380. To qualify for this type of process, the development must meet the basic criteria in ORS 197.360(1)(a) or (b). While the decision-making process is controlled by state law, the approval criteria are found in this code. The Community Development Director has twenty-one days within which to determine whether an application is complete. Once deemed complete, the Community Development Director has sixty-three days within which to issue a decision. Notice of application and opportunity to comment is mailed to the applicant, recognized neighborhood association and property owners within one hundred feet of the subject site. The Community Development Director will accept written comments on the application for fourteen days and then issues a decision. State law prohibits a hearing. Any party who submitted comments may call for an appeal of the Community Development Director's decision before a hearings referee. The referee need not hold a hearing; the only requirement is that the determination be based on the evidentiary record established by the Community Development Director and that the process be "fair." The referee applies the city's approval standards, and has forty-two days within which to issue a decision on the appeal. The referee is charged with the general objective to identify means by which the application can satisfy the applicable requirements without reducing density. The referee's decision is appealable only to the court of appeals pursuant to ORS 197.375(8) and 36.355(1).

17.50.040 Development Review in Overlay Districts and for Erosion Control.

For any development subject to regulation of Geologic Hazards under city code Chapter 17.44; Natural Resource under Chapter 17.49; Willamette River Greenway under Chapter 17.48; and erosion control under Chapter 17.47, compliance with the requirements of these chapters shall be reviewed as part of the review process required for the underlying development for the site.

17.50.050 Preapplication Conference and Neighborhood Meeting.

A. Neighborhood Association Meeting. The purpose of the meeting with the recognized neighborhood association is to inform the affected neighborhood association about the proposed development and to receive the preliminary responses and suggestions from the neighborhood association and the member residents. Conditional use, subdivision, or site plan and design review (excluding minor site plan and design review) applications shall schedule and attend a meeting with the city-recognized neighborhood association in whose territory the application is proposed. Although not required for other projects than those identified above, a meeting with the neighborhood association is highly recommended. The applicant shall send, by certified mail, return receipt requested, a letter to the chairperson of the neighborhood association and the Citizen Involvement Committee describing the proposed project. A meeting shall be scheduled within 30 days of the notice. If the neighborhood association does not want to, or cannot meet within 30 days, the applicant shall hold their own meeting after 6pm or on the weekend, with notice to the neighborhood association, Citizen Involvement Committee, and all property owners within 300 feet. If the applicant holds their own

meeting, a copy of the certified letter shall be required for a complete application. The meeting shall be held within the boundaries of the neighborhood association or in a City facility.

B. Preapplication Conference. Prior to submitting an application for any form of permit, the applicant shall schedule and attend a preapplication conference with City staff to discuss the proposal. To schedule a preapplication conference, the applicant shall contact the Planning Division, submit the required materials, and pay the appropriate conference fee. At a minimum, an applicant should submit a short narrative describing the proposal and a proposed site plan, drawn to a scale acceptable to the City, which identifies the proposed land uses, traffic circulation, and public rights-of-way and all other required plans. The purpose of the preapplication conference is to provide an opportunity for staff to provide the applicant with information on the likely impacts, limitations, requirements, approval standards, fees and other information that may affect the proposal. The Planning Division shall provide the applicant(s) with the identity and contact persons for all affected neighborhood associations as well as a written summary of the preapplication conference. Notwithstanding any representations by City staff at a preapplication conference, staff is not authorized to waive any requirements of this code, and any omission or failure by staff to recite to an applicant all relevant applicable land use requirements shall not constitute a waiver by the City of any standard or requirement.

E. A preapplication conference shall be valid for a period of six months from the date it is held. If no application is filed within six months of the conference or meeting, the applicant must schedule and attend another conference before the City will accept a permit application. The Community Development Director may waive the preapplication requirement if, in the Director's opinion, the development does not warrant this step.

17.50.060 Application Requirements.

A permit application may only be initiated by the record property owner or contract purchaser, the City Commission or Planning Commission. If there is more than one record owner, then the City will not accept an application without signed authorization from all record owners. All permit applications must be submitted on the form provided by the City, along with the appropriate fee and all necessary supporting documentation and information, sufficient to demonstrate compliance with all applicable approval criteria. The applicant has the burden of demonstrating, with evidence, that all applicable approval criteria are, or can be, met.

17.50.070 Completeness Review and 120-day Rule.

A. Upon submission, the Community Development Director shall date stamp the application form and verify that the appropriate application fee has been submitted. The Community Development Director will then review the application and all information submitted with it and evaluate whether the application is complete enough to process. Within thirty days of receipt of the application, the Community Development Director shall complete this initial review and issue to the applicant a written statement indicating whether the application is complete enough to process, and if not, what information must be submitted to make the application complete.

B. The applicant has 180 days from the date the application was made to submit the missing information or, on the 181st day, the application shall be rejected and all materials (except one copy of the application) and the unused portion of the application fee returned to the applicant. If the applicant submits the requested information within the 180-day period, the Community Development Director shall again verify whether the application, as augmented, is complete. Each such review and verification shall follow the procedure in subsection A of this section.

The application will be deemed complete for the purpose of this section upon receipt by the Community Development Division of:

1.All the missing information;

2. Some of the missing information and written notice from the applicant that no other information will be provided; or

3. Written notice from the applicant that none of the missing information will be provided.

C. Once the Community Development Director determines the application is complete enough to process, or the applicant refuses to submit any more information, the City shall declare the application complete. Pursuant to ORS 227.178, the City will reach a final decision on an application within 120 calendar days from the date that the application is determined to be or deemed complete unless the applicant agrees to suspend the 120 calendar day time line or unless State law provides otherwise. The 120-day period, however, does not apply in the following situations:

1. Any hearing continuance or other process delay requested by the applicant shall be deemed an extension or waiver, as appropriate, of the 120-day period.
2. Any delay in the decision-making process necessitated because the applicant provided an incomplete set of mailing labels for the record property owners within three hundred feet of the subject property shall extend the 120-day period for the amount of time required to correct the notice defect.
3. The 120-day period does not apply to any application for a permit that is not wholly within the city's authority and control.
4. The 120-day period does not apply to any application for an amendment to the City's Comprehensive Plan or land use regulations nor to any application for a permit, the approval of which depends upon a plan amendment.

D. The 120-day period specified in Section 17.50.070.C may be extended for a specified period of time at the written request of the applicant. The total of all extensions may not exceed 245 calendar days..

E. The approval standards that control the City's review and decision on a complete application are those which were in effect on the date the application was first submitted.

17.50.080 Complete Application--Required Information.

Unless stated elsewhere in City code Titles 16 or 17, a complete application includes all the materials listed in this subsection. The Community Development Director may waive the submission of any of these materials if not deemed to be applicable to the specific review sought. Likewise, within thirty days of when the application is first submitted, the Community Development Director may require additional information, beyond that listed in this subsection or elsewhere in Titles 16 or 17, such as a traffic study or other report prepared by an appropriate expert. In any event, the applicant is responsible for the completeness and accuracy of the application and all of the supporting documentation, and the city will not deem the application complete until all information required by the Community Development Director is submitted. At a minimum, the applicant must submit the following:

A. One copy of a completed city application form that includes the following information:

1. An accurate legal description, tax account number(s), map and location of all properties that are the subject of the application,
2. Name, address, telephone number and authorization signature of all record property owners or contract owners, and the name, address and telephone number of the applicant, if different from the property owner(s);

B. A complete list of the permit approvals sought by the applicant;

C. A current preliminary title report for the subject property(ies);

D. A complete and detailed narrative description of the proposed development that describes existing site conditions, existing buildings, public facilities and services, presence of wetlands, steep slopes and other natural features, a discussion of the approval criteria for all permits required for approval of the development proposal that explains how the criteria are or can be met, and any other information indicated by staff at the preapplication conference as being required;

E. Up to twenty-one legible copies of all reports, plans, site plans and other documents required by the section of this code corresponding to the specific approval(s) sought;

F. At least one copy of the site plan and all related drawings shall be in a readable/legible eight and one-half by eleven inch format for inclusion into the city's bound record of the application;
G. Mailing labels for notice to all parties entitled under Section 17.50.090 to receive mailed notice of the application. The applicant shall use the names and addresses of property owners within the notice area indicated on the most recent property tax rolls;
H. All required application fees;
I. Annexation agreements (if applicable);
J. Additional documentation as needed by the Community Development Director.

17.50.090 Public Notices.

17.50.090 Public notices.
All public notices issued by the city with regard to a land use matter, announcing applications or public hearings of quasi-judicial or legislative actions, shall comply with the requirements of this section.

A. Notice of Type II Applications. Once the planning manager has deemed a Type II application complete, the city shall prepare and send notice of the application, by first class mail, to all record owners of property within three hundred feet of the subject property and to any city-recognized neighborhood association whose territory includes the subject property. Pursuant to Section 17.50.080(H), the applicant is responsible for providing an accurate and complete set of mailing labels for these property owners and for posting the subject property with the city-prepared notice in accordance with Section 17.50.100. The city's Type II notice shall include the following information:

1. Street address or other easily understood location of the subject property and city-assigned planning file number;
2. A description of the applicant's proposal, along with citations of the approval criteria that the city will use to evaluate the proposal;
3. A statement that any interested party may submit to the city written comments on the application during a fourteen-day comment period prior to the city's deciding the application, along with instructions on where to send the comments and the deadline of the fourteen-day comment period;
4. A statement that any issue which is intended to provide a basis for an appeal must be raised in writing during the fourteen-day comment period with sufficient specificity to enable the city to respond to the issue;
5. A statement that the application and all supporting materials may be inspected, and copied at cost, at City Hall during normal business hours;
6. The name and telephone number of the planning staff person assigned to the application or is otherwise available to answer questions about the application.
7. The notice shall state that a city-recognized neighborhood association requesting an appeal fee waiver pursuant to 17.50.290(C) must officially approve the request through a vote of its general membership or board at a duly announced meeting prior to the filing of an appeal.

B. Notice of Public Hearing on a Type III or IV Quasi-Judicial Application. Notice for all public hearings concerning a quasi-judicial application shall conform to the requirements of this subsection. At least twenty days prior to the hearing, the city shall prepare and send, by first class

mail, notice of the hearing to all record owners of property within three hundred feet of the subject property and to any city-recognized neighborhood association whose territory includes the subject property. The city shall also publish the notice in a newspaper of general circulation within the city at least twenty days prior to the hearing. Pursuant to Section 17.50.080(H), the applicant is responsible for providing an accurate and complete set of mailing labels for these property owners and for posting the subject property with the city-prepared notice in accordance with Section 17.50.100. Notice of the application hearing shall include the following information:

1. The time, date and location of the public hearing;
2. Street address or other easily understood location of the subject property and city-assigned planning file number;
3. A description of the applicant's proposal, along with a list of citations of the approval criteria that the city will use to evaluate the proposal;
4. A statement that any interested party may testify at the hearing or submit written comments on the proposal at or prior to the hearing and that a staff report will be prepared and made available to the public at least seven days prior to the hearing;
5. A statement that any issue which is intended to provide a basis for an appeal to the city commission must be raised before the close of the public record. Issues must be raised and accompanied by statements or evidence sufficient to afford the city and all parties to respond to the issue;
6. The notice shall state that a city-recognized neighborhood association requesting an appeal fee waiver pursuant to 17.50.290(C) must officially approve the request through a vote of its general membership or board at a duly announced meeting prior to the filing of an appeal.
7. A statement that the application and all supporting materials and evidence submitted in support of the application may be inspected at no charge and that copies may be obtained at reasonable cost at City Hall during normal business hours; and
8. The name and telephone number of the planning staff person responsible for the application or is otherwise available to answer questions about the application.

C. Notice of Public Hearing on a Legislative Proposal. At least twenty days prior to a public hearing at which a legislative proposal to amend or adopt the city's land use regulations or comprehensive plan is to be considered, the planning manager shall issue a public notice that conforms to the requirements of this subsection. Notice shall be sent to affected governmental entities, special districts, providers of urban services, including Tri-Met, Oregon Department of Transportation and Metro, any affected recognized neighborhood associations and any party who has requested in writing such notice. Notice shall also be published in a newspaper of general circulation within the city. Notice issued under this subsection shall include the following information:

1. The time, date and location of the public hearing;
2. The city-assigned planning file number and title of the proposal;
3. A description of the proposal in sufficient detail for people to determine the nature of the change being proposed;
4. A statement that any interested party may testify at the hearing or submit written comments on the proposal at or prior to the hearing; and

5. The name and telephone number of the planning staff person responsible for the proposal and who interested people may contact for further information.

17.50.100 Notice Posting Requirements.

Where this chapter requires notice of a pending or proposed permit application or hearing to be posted on the subject property, the requirements of this section shall apply.

A. City Guidance and the Applicant's Responsibility. The City shall supply all of the notices which the applicant is required to post on the subject property and shall specify the dates the notices are to be posted and the earliest date on which they may be removed. The City shall also provide a statement to be signed and returned by the applicant certifying that the notice(s) were posted at the correct time and that if there is any delay in the City's land use process caused by the applicant's failure to correctly post the subject property for the required period of time and in the correct location, the applicant agrees to extend the one-hundred-twenty-day period in a timely manner.

B. Number and Location. The applicant must place the notices on each frontage of the subject property. If the property's frontage exceeds six hundred feet, the applicant shall post one copy of the notice for each six hundred feet or fraction thereof. Notices do not have to be posted adjacent to alleys or unconstructed right-of-way. Notices shall be posted within ten feet of the street and shall be visible to pedestrians and motorists. Notices shall not be posted within the public right-of-way or on trees. The applicant shall remove all signs within ten days following the event announced in the notice.

17.50.110 Assignment of Decision-Makers.

The following City entity or official shall decide the following types of applications:

A. Type I Decisions. The Community Development Director shall render all Type I decisions. The Community Development Director's decision is the City's final decision on a Type I application.

B. Type II Decisions. The Community Development Director shall render the City's decision on all Type II permit applications which are appealable to the City Commission with notice to the Planning Commission. The City Commission decision is appealable to LUBA.

C. Type III Decisions. The Planning Commission or Historic Review Board, as applicable, shall render all Type III decisions. Such decision is appealable to the City Commission, on the record. The City Commission's decision is the City's final decision and is appealable to LUBA within twenty-one days of when it becomes final.

D. Type IV Decisions. The Planning Commission shall render the initial decision on all Type IV permit applications. If the Planning Commission denies the Type IV application, that decision is final unless appealed to the City Commission in accordance with Section 17.50.190. If the Planning Commission recommends approval of the application, that recommendation is forwarded to the City Commission. The City Commission decision is the City's final decision on a Type IV application and is appealable to LUBA.

E. ELD. The Community Development Director shall render the initial decision on all ELD applications. The Community Development Director's decision is the City's final decision unless appealed in accordance to ORS 197.375 to a City-appointed hearings referee. The hearings referee decision is the City's final decision which is appealable to the Oregon Court of Appeals.

17.50.120 Quasi-Judicial Hearing Process.

All public hearings pertaining to quasi-judicial permits, whether before the Planning Commission, Historic Review Board, or City Commission, shall comply with the procedures of this section. In addition, all public hearings held pursuant to this chapter shall comply with the Oregon Public Meetings Law, the applicable provisions of ORS 197.763 and any other applicable law.

A. Once the Community Development Director determines that an application for a Type III or IV decision is complete, the Planning Division shall schedule a hearing before the Planning Commission or Historic Review Board, as applicable. Once the Community Development Director determines that an appeal of a Type II, Type III or Type IV decision has been properly filed under Section 17.50.190, the planning division shall schedule a hearing before the City Commission.
B. Notice of the Type III or IV hearing shall be issued at least twenty days prior to the hearing in accordance with Section 17.50.090(B).
C. Written notice of an appeal hearing before the City Commission shall be sent by regular mail no later than 14 days prior to the date of the hearing to the appellant, the applicant if different from the appellant, the property owner(s) of the subject site, all persons who testified either orally or in writing before the hearing body and all persons that requested in writing to be notified.
D. The Community Development Director shall prepare a staff report on the application which lists the applicable approval criteria, describes the application and the applicant's development proposal, summarizes all relevant city department, agency and public comments, describes all other pertinent facts as they relate to the application and the approval criteria and makes a recommendation as to whether each of the approval criteria are met.
E. At the beginning of the initial public hearing at which any quasi-judicial application or appeal is reviewed, a statement describing the following shall be announced to those in attendance:
    1. That the hearing will proceed in the following general order: staff report, applicant's presentation, testimony in favor of the application, testimony in opposition to the application, rebuttal, record closes, commission deliberation and decision;
    2. That all testimony and evidence submitted, orally or in writing, must be directed toward the applicable approval criteria. If any person believes that other criteria apply in addition to those addressed in the staff report, those criteria must be listed and discussed on the record. The meeting chairperson may reasonably limit oral presentations in length or content depending upon time constraints. Any party may submit written materials of any length while the public record is open;
    3. Failure to raise an issue on the record with sufficient specificity and accompanied by statements or evidence sufficient to afford the city and all parties to respond to the issue, will preclude appeal on that issue to the state land use board of appeals;
    4. Any party wishing a continuance or to keep open the record must make that request while the record is still open; and
    5. That the Commission chair shall call for any ex-parte contacts, conflicts of interest or bias before the beginning of each hearing item.
    6. For appeal hearings, only those persons who participated either orally or in writing in the decision or review will be allowed to participate either orally or in writing on the appeal.
F. Requests for continuance and to keep open the record: The hearing may be continued to allow the submission of additional information or for deliberation without additional information. New notice of a continued hearing need not be given so long as a time-certain and location is established for the continued hearing. Similarly, hearing may be closed but the record kept open for the submission of additional written material or other documents and exhibits. The chairperson may limit the factual and legal issues that may be addressed in any continued hearing or open-record period.

17.50.130 Conditions of Approval and Notice of Decision.

A. All City decision-makers have the authority to impose reasonable conditions of approval designed to ensure that all applicable approval standards are, or can be, met.
B. Failure to comply with any condition of approval shall be grounds for revocation of the permit(s) and grounds for instituting code enforcement proceedings pursuant to Chapter 1.20 of this code and ORS 30.315.

C. Notice of Decision. The City shall send, by first class mail, a notice of all decisions rendered under this chapter to all persons with standing, i.e., the applicant, all others who participated either orally or in writing before the close of the public record and those who specifically requested notice of the decision. The notice of decision shall include the following information:
   1. The file number and date of decision;
   2. The name of the applicant, owner and appellant (if different);
   3. The street address or other easily understood location of the subject property;
   4. A brief summary of the decision, and if an approval, a description of the permit approved;
   5. A statement that the decision is final unless appealed and description of the requirements for perfecting an appeal;
   6. The contact person, address and a telephone number whereby a copy of the final decision may be inspected or copies obtained.

D. Modification of Conditions. Any request to modify a condition of permit approval is to be considered either minor modification or a major modification. A minor modification shall be processed as a Type I. A major modification shall be processed in the same manner and shall be subject to the same standards as was the original application. However, the decision-maker may at their sole discretion, consider a modification request and limit its review of the approval criteria to those issues or aspects of the application that are proposed to be changed from what was originally approved.

17.50.140 Performance Guarantees.

When conditions of permit approval require a permitee to construct certain improvements, the city may, in its discretion, allow the permitee to submit a performance guarantee in lieu of actual construction of the improvement. Performance guarantees shall be governed by this section.

A. Form of Guarantee. Performance Guarantees shall be in a form approved by the city attorney Approvable methods of performance guarantee include irrevocable standby letters of credit to the benefit of the city issued by a recognized lending institution, certified checks, dedicated bank accounts or allocations of construction loans held in reserve by the lending institution for the benefit of the city. The form of guarantee shall be specified by the City Engineer and, prior to execution and acceptance by the city shall be reviewed and approved by the City Attorney. The guarantee shall be filed with the City Engineer.

B. Timing of Gurantee. A permittee shall be required to provide a performance guarantee as follows.
   1. After Final Approved Design By The City: A permitee may request the option of submitting a performance guarantee when prepared for temporary/final occupancy. The guarantee shall be one hundred twenty percent of the estimated cost of constructing the remaining public improvements as submitted by the permittee's engineer. The engineer's estimated costs shall be supported by a verified engineering estimate and approved by the City Engineer.
   2. Before Complete Design Approval And Established Engineered Cost Estimate: A permitee may request the option of submitting a performance guarantee before public improvements are designed and completed. The guarantee shall be one hundred fifty percent of the estimated cost of constructing the public improvements as submitted by the permittee's engineer and approved by the City Engineer. The engineer's estimated costs shall be supported by a verified engineering estimate and approved by the City Engineer. This scenario applies for a fee-in-lieu situation to ensure adequate funds for the future work involved in design, bid, contracting, and construction management and contract closeout. In this case, the fee-in-lieu must be submitted as cash, certified check, or other negotiable instrument as approved to form by the City Attorney.

C. Duration of the Guarantee. The guarantee shall remain in effect until the improvement is actually constructed and accepted by the city. Once the city has inspected and accepted the improvement, the city shall release the guarantee to the permittee. If the improvement is not completed to the city's satisfaction within the time limits specified in the permit approval, the City Engineer may, at their discretion, draw upon the guarantee and use the proceeds to construct or complete construction of the

improvement and for any related administrative and legal costs incurred by the city in completing the construction, including any costs incurred in attempting to have the permittee complete the improvement. Once constructed and approved by the city, any remaining funds shall be refunded to the permittee. The City shall not allow a permittee to defer construction of improvements by using a performance guarantee, unless the permittee agrees to construct those improvements upon written notification by the city, or at some other mutually agreed-to time. If the permittee fails to commence construction of the required improvements within six months of being instructed to do so, the city may, without further notice, undertake the construction of the improvements and draw upon the permittee's performance guarantee to pay those costs.

17.50.150 Covenant with the City.

A. The City may impose as a condition of final approval of a quasi-judicial permit, the requirement that the applicant execute a covenant with the City agreeing to comply with all conditions of approval. Any such covenant shall include the following elements:
   1. An agreement that the applicant will comply with all applicable code requirements, conditions of approval and any representations made to the City by the applicant or the applicant's agents during the application review process, in writing. This commitment shall be binding on the applicant and all of the applicant's successors, heirs and assigns;
   2. If the owner fails to perform under the covenant, the City may immediately institute revocation of the approval or any other enforcement action available under state law or this code. The covenant may also provide for payment of attorney fees and other costs associated with any such enforcement action; and
   3. Where the development rights of one site are dependent on the performance of conditions by the owner of another property (such as joint access), the covenants are judicially enforceable by the owner of one site against the owner of another.

B. Adopting the covenant: The form of all covenants shall be approved by the City attorney. The covenant shall run with the land and shall be placed in the county deed records prior to the issuance of any permits or development activity pursuant to the approval. Proof of recording shall be made prior to the issuance of any permits and filed with the Planning Division. Recording shall be at the applicant's expense. Any covenant required under this section shall be properly signed and executed within thirty days after permit approval with conditions; provided, however, that the Community Development Director may grant reasonable extensions, not to exceed an additional thirty days, in cases of practical difficulty. Failure to sign and record the covenant within the prescribed period shall require a new application for any use of the subject property.

17.50.160 Ex parte Contact, Conflict of Interest and Bias.

The following rules shall govern any challenges to a decision-maker's participation in a quasi-judicial or legislative action:

A. Ex parte Contacts. Any factual information obtained by a decision-maker outside the context of a quasi-judicial hearing shall be deemed an ex parte contact. Prior to the close of the record in any particular matter, any decision-maker that has obtained any materially factual information through an ex parte contact shall declare the content of that contact and allow any interested party to rebut the substance of that contact. This rule does not apply to legislative proceedings.

B. Conflict of Interest. Whenever a decision-maker, or any member of a decision-makers's immediate family or household, has a financial interest in the outcome of a particular quasi-judicial or legislative matter, that decision-maker shall not participate in the deliberation or decision on that matter.

C. Bias. All decisions in quasi-judicial matters shall be fair, impartial and based on the applicable approval standards and the evidence in the record. Any decision-maker who is unable to render a

decision on this basis in any particular matter shall refrain from participating in the deliberation or decision on that matter. This rule does not apply to legislative proceedings.

17.50.170 Legislative Hearing Process.

A. Purpose. Legislative actions involve the adoption or amendment of the City's land use regulations, comprehensive plan, maps, inventories and other policy documents that affect the entire city or large portions of it. Legislative actions which affect land use must begin with a public hearing before the planning commission.

B. Planning Commission Review.

1. Hearing Required. The Planning Commission shall hold at least one public hearing before recommending action on a legislative proposal. Any interested person may appear and provide written or oral testimony on the proposal at or prior to the hearing. The Community Development Director shall notify the Oregon Department of Land Conservation and Development (DLCD) as required by the post-acknowledgment procedures of ORS 197.610 to 197.625, as applicable.
2. The Community Development Director's Report. Once the Planning Commission hearing has been scheduled and noticed in accordance with Section 17.50.090(C) and any other applicable laws, the Community Development Director shall prepare and make available a report on the legislative proposal at least seven days prior to the hearing.
3. Planning Commission Recommendation. At the conclusion of the hearing, the Planning Commission shall adopt a recommendation on the proposal to the City Commission. The Planning Commission shall make a report and recommendation to the City Commission on all legislative proposals. If the Planning Commission recommends adoption of some form of the proposal, the Planning Commission shall prepare and forward to the City Commission a report and recommendation to that effect.

C. City Commission Review.

1. City Commission Action. Upon a recommendation from the Planning Commission on a legislative action, the city commission shall hold at least one public hearing on the proposal. Any interested person may provide written or oral testimony on the proposal at or prior to the hearing. At the conclusion of the hearing, the City Commission may adopt, modify or reject the legislative proposal, or it may remand the matter to the Planning Commission for further consideration. If the decision is to adopt at least some form of the proposal, and thereby amend the City's land use regulations, Comprehensive Plan, official zoning maps or some component of any of these documents, the City Commission decision shall be enacted as an ordinance.
2. Notice of Final Decision. Not later than five days following the City Commission final decision, the Community Development Director shall mail notice of the decision to DLCD in accordance with ORS 197.615(2).

17.50.180 Objections to Procedure.

Any party who objects to the procedure followed in any particular matter, including bias, conflict of interest and undisclosed ex parte contacts, must make a procedural objection prior to the city rendering a final decision. Procedural objections may be raised at any time prior to a final decision, after which they are deemed waived. In making a procedural objection, the objecting party must identify the procedural requirement that was not properly followed and identify how the alleged procedural error harmed that person's substantial rights.

17.50.190 Appeals.

Appeals of any non-final decisions by the city must comply with the requirements of this section.

A. Type I decisions by the planning manager are not appealable to any other decision-maker within the city.

B. A notice of appeal of any Type II, III or IV decision must be received in writing by the planning division within ten calendar days from the date notice of the challenged decision is provided to those entitled to notice. Late filing of any appeal shall be deemed a jurisdictional defect and will result in the automatic rejection of any appeal so filed.

C. The following must be included as part of the notice of appeal:

1. The city planning file number and date the decision to be appealed was rendered;
2. The name, mailing address and daytime telephone number for each appellant;
3. A statement of how each appellant has an interest in the matter and standing to appeal;
4. A statement of the specific grounds for the appeal;
5. The appropriate appeal fee. Failure to include the appeal fee within appeal period is deemed to be a jurisdictional defect and will result in the automatic rejection of any appeal so filed. If a City-recognized neighborhood association with standing to appeal has voted to request a fee waiver pursuant to 17.50.290(C), no appeal fee shall be required for an appeal filed by that association. In lieu of the appeal fee, the neighborhood association shall provide a duly adopted resolution of the general membership or board approving the request for fee waiver.

D. Standing to Appeal. The following rules prescribe who has standing to appeal:

1. For Type II decisions, only those persons or recognized Neighborhood Associations who have submitted written comments within the fourteen-day comment period have standing to appeal a planning manager decision. Grounds for appeal are limited to those issues raised in writing during the fourteen-day comment period in filing an appeal to the city commission.

2. For Type III and IV decisions, only those persons or recognized Neighborhood Associations who have participated either orally or in writing have standing to appeal the decision of the planning commission or historic review board, as applicable. Grounds for appeal are limited to those issues raised either orally or in writing before the close of the public record.

E. Notice of the Appeal Hearing. The planning division shall issue notice of the appeal hearing to all parties who participated either orally or in writing before the close of the public record in accordance with Section 17.50.090(B). Notice of the appeal hearing shall contain the following information:

1. The file number and date of the decision being appealed;
2. The time, date and location of the public hearing;
3. The name of the applicant, owner and appellant (if different);
4. The street address or other easily understood location of the subject property;
5. A description of the permit requested and the applicant's development proposal;
6. A brief summary of the decision being appealed and the grounds for appeal listed in the notice of appeal;
7. A statement that the appeal hearing is confined to the issues raised in the notice of appeal;
8. A general explanation of the requirements for participation and the city's hearing procedures.

F. Appeal Hearing--Scope of Review. Appeal hearings shall comply with the procedural requirements of Section 17.50.120. Appeal hearings shall be conducted by the city commission or a planning commission or historic review board, as applicable, the decision shall be on the record and the issues under consideration shall be limited to those listed in the notice of appeal.

17.50.200 Expiration of an Approval.

A. When approvals become void: All Type IV approvals, except for zoning map or comprehensive plan map amendments, automatically become void if any of the following events occur:
   1. If, within two years of the date of the final decision, a building permit has not been issued for no land divisions; or
   2. If, within two years of the date of the final decision for all land divisions, the activity approved in the permit has not commenced or, in situations involving only the creation of lots, the public improvements and conditions of approval have not been completed or financial guarantee (surety) provided
B. New application required: Expiration of an approval shall require a new application for any use on the subject property that is not otherwise allowed outright.
C. Deferral of the expiration period due to appeals: If a permit decision is appealed beyond the jurisdiction of the City, the expiration period shall not begin until review before the Land Use Board of Appeals and the appellate courts has been completed, including any remand proceedings before the City. The expiration period provided for in this section will begin to run on the date of final disposition of the case (the date when an appeal may no longer be filed).

17.50.210 Extension of an Approval.

A. The Community Development Director may extend, prior to its expiration, any approved permit for a period of one year; provided, however, that there has been substantial implementation of the permit. Any request for an extension shall be reviewed and decided upon by the Community Development Director as a Type II decision.
B. Substantial implementation of a permit shall require at a minimum, demonstrable evidence in a written application showing:
   1. The permit holder has applied for all necessary additional approvals or permits required as a condition of the land use or limited land use permit;
   2. Further commencement of the development authorized by the permit could not practicably have occurred for reasons beyond the reasonable control of the permit holder;
   3. The request for an extension is not sought for purposes of avoiding any responsibility imposed by this code or the permit or any condition thereunder; and
   4. There have been no changes in circumstances or the law likely to necessitate significant modifications of the development approval or conditions of approval.

17.50.220 Reapplication Limited.

If the application is denied or withdrawn following the close of the public hearing, no reapplication for the same or substantially similar proposal may be made for one year following the date of final decision denying the permit.

17.50.230 Interpretation.

Where a provision of Title 16 or Title 17 conflicts with another city ordinance or requirement, the provision or requirement that is more restrictive or specific shall control.

17.50.240 Conformity of Permits.

The City shall not accept any application for a permit, certificate or other approval, including building permit applications, for any property that is not in full compliance with all applicable provisions of Title 16 and Title 17 and any permit approvals previously issued by the city.

17.50.260 Reconsideration of a Final Decision.

Under this section, parties with standing may seek reconsideration of a final decision rendered pursuant to a Type II, Type III, or Type IV process. Reconsideration is warranted where the City's decision indicates the decision-maker failed to understand or consider certain relevant facts in the record or misinterpreted the application in some material way. Any request for reconsideration must be received by the Planning Division within ten days of when the decision in question was rendered and must specifically describe the alleged misunderstanding or misinterpretation. A request for reconsideration shall not stay the effectiveness of the City's final decision, nor shall it affect any applicable appeal deadlines to the land use board of appeals. If the request is granted, the Community Development Director shall notify all affected parties that the decision will be reconsidered. Any request for reconsideration by the applicant shall be deemed a waiver of the one-hundred-twenty-day deadline under Section 17.50.070.

17.50.270 Revocation of a Previously Approved Permit.

In the event an applicant, or the applicant's successor in interest, fails to fully comply with all conditions of permit approval or otherwise does not comply fully with the City's approval, the City may institute a revocation or modification proceeding under this section.

A. Situations when Permit Approvals May Be Revoked or Modified. All quasi-judicial permits may be revoked or modified if the Planning Commission determines a substantial likelihood that any of the following situations exists:
   1. One or more conditions of the approval have not been implemented or have been violated;
   2. The activities of the use, or the use itself, are substantially different from what was approved; or
   3. The use is subject to the nonconforming use regulations, the applicant has not obtained approval, and has substantially changed its activities or substantially increased the intensity of its operations since the use became nonconforming.

B. Process for Revocation and Modification. Revocation or modification shall be processed as a Type IV decision. The Planning Division or any private complaining party shall have the burden of proving, based on substantial evidence in the whole record, that the applicant or the applicant's successor has in some way violated the City's approval.

C. Possible Actions at the Revocation Hearing. Depending on the situation, the Planning Commission may take any of the actions described below. The Planning Commission may not approve the new use or a use that is more intense than originally approved unless the possibility of this change has been stated in the public notice. Uses or development which are alleged to have not fulfilled conditions, violate conditions or the use is not consistent with the City's approval may be subject to the following actions:
   1. The Planning Commission may find that the use or development is complying with the conditions of the approval. In this case, the use or development shall be allowed to continue.
   2. The Planning Commission may modify the approval if it finds that the use or development does not meet the standards for revocation and that the use can comply with the original approval criteria if certain conditions are met. In this case, the Planning Commission may modify the existing conditions, add new conditions to ensure compliance with the approval criteria, or refer the case to the code compliance officer for enforcement of the existing conditions.

3. The Planning Commission may revoke the approval if it finds there are substantial violations of conditions or failure to implement conditions of prior land use decisions, such that the original approval criteria for the use or development are not being met.

D. Effect of Revocation. In the event permit approval is revoked, the use or development becomes illegal. The use or development shall be terminated within thirty days of the date the revocation final order is approved by the Planning Commission, unless the decision provides otherwise. In the event the decision-maker's decision on a revocation request is appealed, the revocation action shall be stayed pending a final, unappealed decision.

17.50.280 Transfer of Approval Rights.

Unless otherwise stated in the City's permit decision, any approval granted under Title 16 or Title 17 of this code runs with the land and is transferred with ownership of the land. Any conditions, time limits or other restrictions imposed with a permit approval shall bind all subsequent owners of the property for which the permit was granted.

17.50.290 Fees.

The City may adopt by resolution, and revise from time to time, a schedule of fees for applications and appeals. Fees shall be based upon the City's actual or average cost of processing the application or conducting the appeal process. The only exception shall be the appeal fee for a Type II decision, which shall be limited by ORS 227.175(10)(b). The requirements of this section shall govern the payment, refund and reimbursement of fees.

A. Payment. All fees shall be due and payable at the time the application or appeal is submitted. No application or appeal shall be accepted without the proper fee being paid.

B. Refunds. Fees will only be refunded as provided in this subsection:
   1. When a fee is paid for an application which is later found to not be required, the city shall refund the fee.
   2. Errors. When an error is made in calculating a fee, overpayment will be refunded.
   3. Refund upon Withdrawal of an Application. In the event an applicant withdraws an application, the planning department shall refund the unused portion of the fee. In this case, the planning department will deduct from the fee the city's actual costs incurred in processing the application prior to withdrawal.

C. Fee Waivers. The Planning Division may waive all or any portion of an application fee if, in the opinion of the director, a particular application must be resubmitted because of an error made by the City. Appeal fees may be waived, wholly or in part, by the City Commission, if the City Commission finds that, considering fairness to the applicant and to opposing parties, a full or partial waiver of the appeal fee is warranted. Appeal fees shall not be charged for an appeal filed by a city-recognized neighborhood association, so long as the appeal has been officially approved by the general membership or board of the neighborhood association at a duly announced meeting.

Oregon City Municipal Code
Chapter 17.52 Off-Street Parking and Loading

17.52.010 Number of Spaces Required.

The construction of a new structure or at the time of enlargement or change in use of an existing structure within any district in the city, off-street parking spaces shall be provided in accordance with this section. In the event several uses occupy a single structure or parcel of land, the total requirements for off-street parking shall be the sum of the requirements of the several uses computed separately. Requirements for types of buildings and uses not specifically listed herein shall be determined by the Community Development Director, based upon the requirements of comparable uses listed. Where calculation in accordance with the following list results in a fractional space, any fraction less than one-half shall be disregarded and any fraction of one-half or more shall require one space. The required number of parking stalls may be reduced if one or more of the following is met:

A. Transit Oriented Development. The Community Development Director may reduce the required number of parking stalls up to 10% when it is determined that a commercial business center or multi-family project is adjacent to or within 1,000 feet of an existing or planned public transit. Also, if a commercial center is within 1,000 feet of a multi-family project, with over 80 units and pedestrian access, the parking requirements may be reduced by ten percent.

B. Transportation Demand Management. The Community Development Director may reduce the required number of parking stalls up to 10% when a parking-traffic study prepared by a traffic engineer demonstrates:
   1. Alternative modes of transportation, including transit, bicycles, and walking, and/or special characteristics of the customer, client, employee or resident population will reduce expected vehicle use and parking space demand for this development, as compared to standard Institute of Transportation Engineers vehicle trip generation rates and minimum city parking requirements.
   2. A Transportation Demand Management (TDM) Program has been developed for approval by the City Engineer. The plan will contain strategies for reducing vehicle use and parking demand generated by the development and will be measured annually. If, at the annual assessment, the City determines the plan is not successful, the plan may be revised. If the City determines that no good-faith effort has been made to implement the plan, the City may take enforcement actions.

C. Shared Parking. The Community Development Director may reduce the required number of parking stalls up to 50% for:
   1. Mixed uses. If more than one type of land use occupies a single structure or parcel of land, the total requirements for off-street automobile parking shall be the sum of the requirements for all uses, unless it can be shown that the peak parking demands are actually less (i.e., the uses operate on different days or at different times of the day). In that case, the total requirements shall be reduced accordingly, up to a maximum reduction of 50%, as determined by the Community Development Director.
   2. Shared parking. Required parking facilities for two or more uses, structures, or parcels of land may be satisfied by the same parking facilities used jointly, to the extent that the owners or operators show that the need for parking facilities does not materially overlay (e.g., uses primarily of a daytime versus nighttime nature), that the shared parking facility is within 1,000 feet of the potential uses, and provided that the right of joint use is evidenced by a recorded deed, lease, contract, or similar written instrument establishing the joint use.
   3. Reduction in Parking for Tree Preservation. The Community Development Director may grant an adjustment to any standard of this provided that the adjustment preserves a

regulated tree or grove so that the reduction in the amount of required pavement can help preserve existing healthy trees in an undisturbed, natural condition. The amount of reduction can be determined only after taking into consideration any unique site conditions and the impact of the reduction on parking needs for the use, and must be approved by the Community Development Director. This reduction is discretionary and subject to the approval of the Community Development Director.

D. On-Street Parking. On-street parking for commercial uses shall conform to the following standards:

1. Dimensions. The following constitutes one on-street parking space:
   a. Parallel parking, each [22] feet of uninterrupted and available curb;
   b. [45/60] degree diagonal, each with [12] feet of curb;
   c. 90 degree (perpendicular) parking, each with [12] feet of curb.
2. Location. Parking may be counted toward the minimum standards in the Parking Requirement Table below when it is on the block face abutting the subject land use. An on-street parking space must not obstruct a required clear vision area and its must not violate any law or street standard.
3. Public Use Required for Credit. On-street parking spaces counted toward meeting the parking requirements of a specific use may not be used exclusively by that use, but shall be available for general public use at all times. Signs or other actions that limit general public use of on-street spaces are prohibited.

LAND USE	PARKING REQUIREMENTS The parking requirements are based on spaces per 1,000 square feet gross leasable area unless otherwise stated.	
	MINIMUM	MAXIMUM
Single-Family Dwelling	1.00 per unit	
Multi-Family: Studio	1.00 per unit	1.5 per unit
Multi-Family: 1 bedroom	1.25 per unit	2.00 per unit
Multi-Family: 2 bedroom	1.5 per unit	2.00 per unit
Multi-Family: 3 bedroom	1.75 per unit	2.50 per unit
Hotel/Motel	1.0 per guest room	1.25 per guest room
Welfare/Correctional Institution	1 per 7 beds	1 per 5 beds
Senior housing, including congregate care, residential care and assisted living facilities; nursing homes and other types of group homes;	1 per 7 beds	1 per 5 beds
Hospital	2	4
Religious Assembly Building	0.25 per seat	0.5 per seat
Preschool Nursery/ Kindergarten	2	3
Elementary/Middle School	1 per classroom	1 per classroom + 1 per administrative employee + 0.25 per seat in auditorium/assembly room/stadium

High School/College/Commercial School for Adults	0.20 per # staff and students	0.30 per # staff and students
Auditorium/Meeting Room/Stadium	.25	0.5 per seat
Retail Store/ Shopping Center/ Restaurants	4.10	5.00
Office	2.70	3.33
Medical or Dental Clinic	2.7	3.33
Sports Club/ Recreation Facilities	Case Specific	5.40
Storage Warehouse/ Freight Terminal	0.30 per gross sq-ft	0.40 per gross sq-ft
Manufacturing/ Wholesale Establishment	1.60 per gross sq-ft	1.67 per gross sq-ft
Light Industrial/ Industrial Park	1.3	1.60

17.52.020 Administrative Provisions.

A. The provision and maintenance of off-street parking and loading spaces are continuing obligations of the property owner.
B. Off-street parking for dwellings shall be located on the same lot with the dwelling.
C. Required parking spaces shall be available for the parking of operable passenger automobiles of residents, customers, patrons and employees only, and shall not be used for storage of vehicles or materials or for the parking of trucks used in conducting the business or use.

17.52.030 Design Review.

A. Development of or alterations to existing parking lots shall require site plan review.
B. Access. Ingress and egress locations on public thoroughfares shall be located in the interests of public traffic safety. Groups of more than four parking spaces shall be so located and served by driveways so that their use will require no backing movements or other maneuvering within a street right-of-way other than an alley. No driveway with a slope of greater than fifteen percent shall be permitted without approval of the city engineer.
C. Surfacing. Required off-street parking spaces and access aisles shall have paved surfaces adequately maintained. The use of pervious asphalt/concrete and alternative designs that reduce storm water runoff and improve water quality pursuant to the city's Stormwater and Low Impact Development Design Standards are encouraged.
D. Drainage. Drainage shall be designed in accordance with the requirements of Chapter 13.12 and the city public works stormwater and grading design standards.
E. Dimensional Requirements.
    1. Requirements for parking developed at varying angles are according to the table included in this section. A parking space shall not be less than seven feet in height when within a building or structure, and shall have access by an all-weather surface to a street or alley. Parking stalls in compliance with the American with

Disabilities Act may vary in size in order to comply with the Building Division requirements. Up to 35% of the minimum required parking may be compact, while the remaining required parking stalls are designed to standard dimensions. The Community Development Director may approve alternative dimensions for parking stalls in excess of the minimum requirement which comply with the intent of this chapter.

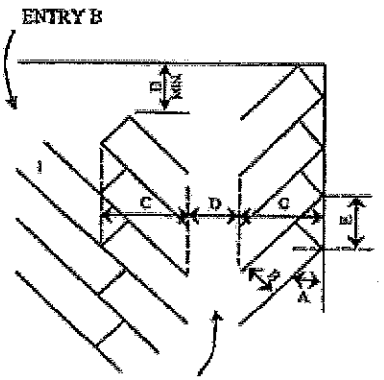
2. Alternative parking/landscaping plan. The city understands the physical constraints imposed upon small parking lots and encourages alternative designs for parking lots of less than 10 parking stalls. The Community Development Director may approve an alternative parking lot/landscaping plan with variations to the parking angle or space dimensions and landscaping standards for off-street parking. The alternative shall be consistent with the intent of this chapter and shall create a safe space for automobiles and pedestrians while retaining landscaping to the quantity and quality found within parking lot landscaping requirements. (Ord. 03-1014, Att. B3 (part), 2003: Ord. 99-1029 §9, 1999; prior code §11-5-3)

PARKING STANDARD
PARKING ANGLE SPACE DIMENSIONS

A Parking Angle		B Stall Width	C Stall to Curb	D Aisle Width	E Curb Length	F Overhang
0 degrees		8.5	9.0	12	20	0
30 degrees	Standard Compact	9' 8'	17.3' 14.9'	11' 11'	18' 16'	
45 degrees	Standard Compact	8.5 8.5	19.8' 17.0'	13' 13'	12.7' 11.3'	1.4
60 degrees	Standard Compact	9' 8'	21' 17.9'	18' 16'	10.4' 9.2'	1.7
90 degrees	Standard Compact	9' 8'	19.0' 16.0'	24' 22'	9' 8'	1.5

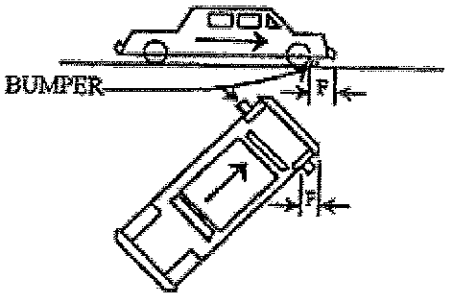
All dimensions are to the nearest tenth of a foot

TYPICAL PARKING LAYOUT



ENTRY A

NOTE: SPACE 1 CONTINGENT UPON ENTRY B



OVERHANG
NOTE: Overhang dimensions are intended to indicate possible location from parking area edge for location of bumpers.

17.52.040 Carpool and Vanpool Parking.

A. New, office l and industrial developments with seventy-five or more parking spaces, and new hospitals, government offices, nursing and retirement homes, schools and transit park-and-ride facilities with fifty or more parking spaces, shall identify the spaces available for employee, student and commuter parking and designate at least five percent, but not fewer than two, of those spaces for exclusive carpool and vanpool parking. Carpool and vanpool parking spaces shall be located closer to the main employee, student or commuter entrance than all other employee, student or commuter parking spaces with the exception of handicapped parking spaces. The carpool/vanpool spaces shall be clearly marked "Reserved - Carpool/Vanpool Only."
B. As used in this section, "carpool" means a group of two or more commuters, including the driver, who share the ride to and from work, school and other destination. "Vanpool" means a group of five or more commuters, including the driver, who share the ride to and from work, school or other destination on a regularly scheduled basis. (Ord. 95-1001 §2(part), 1995)

17.52.050 Bicycle Parking-Purpose-Applicability.

To encourage bicycle transportation to help reduce principal reliance on the automobile, and to ensure bicycle safety and security, bicycle parking shall be provided in conjunction with all of the following uses:
A. Multifamily housing of four or more units;
B. Retail and office development;
C. Industrial development;
D. Institutional development;
E. Transit transfer stations and park-and-ride lots;
F. Automobile parking lots and structures
G. Restaurants
H. Schools
I. Religious Institutions (Ord. 95-1001 §2(part), 1995)

17.52.060 Bicycle Parking Standards.

A. Bicycle parking spaces shall be provided for the uses described in Section 17.52.050, in the amounts specified in Table A,. For any use not specifically mentioned in Table A, the bicycle parking requirements shall be the same as the use which, as determined by the Community Development Director is most similar to the use not specifically mentioned. Calculation of the number of bicycle parking spaces required shall be determined in the manner established in Section 17.52.010 for determining automobile parking space requirements.
   1. Bicycle parking shall be located on-site, in one or more convenient, secure and accessible outdoor and indoor locations close to a main building entrance. The City Engineer and the Community Development Director may permit the bicycle parking to be provided within the public right-of-way. If sites have more than one building, bicycle parking shall be distributed as appropriate to serve all buildings. If a building has two or more main building entrances, the review authority may require bicycle parking to be distributed to serve all main building entrances, as it deems appropriate.
   2. Bicycle parking areas shall be clearly marked. Outdoor bicycle parking areas shall be visible from on-site buildings or the street. Indoor bicycle parking areas shall not require stairs to access the space, except that bicycle parking may be allowed on upper stories within multi-story residential structures.

B. All bicycle parking areas shall be located to avoid conflicts with pedestrian and motor vehicle movement.
   1. Bicycle parking areas shall be separated from motor vehicle parking and maneuvering areas and from arterial streets by a barrier or a minimum of five feet. Areas set aside for required bicycle parking shall be clearly marked and reserved for bicycle parking only. If a bicycle parking area is not plainly visible from the street or main building entrance, then a sign must be posted indicating the location of the bicycle parking area.
   2. Bicycle parking areas shall not obstruct pedestrian walkways; provided, however, that the review authority may allow bicycle parking in the public sidewalk where this does not conflict with pedestrian accessibility.

C. Outdoor bicycle areas shall be connected to main building entrances by pedestrian accessible walks. Outdoor bicycle parking areas also shall have direct access to public right-of-way and to existing and proposed pedestrian/bicycle accessways and pedestrian walkways.

D. Bicycle parking facilities shall offer security in the form of either a lockable enclosure in which the bicycle can be stored or a stationary rack to which the bicycle can be locked. All bicycle racks and lockers shall be securely anchored to the ground or to a structure. Bicycle racks shall be designed so that bicycles may be securely locked to them without undue convenience.

17.52.070 Pedestrian Access in Off-Street Automobile Parking Areas.

Sidewalks and curbs shall be provided in accordance with the city's transportation master plan and development standards within Chapter 17.62.050.A.7 of the Oregon City Municipal Code.

TABLE A Required Bicycle Parking Spaces*	
USE	**BICYCLE PARKING**
Residential	
Multiple family (three or more	1 per unit

units)	
Commercial Residential	
Hotel and Motel	1 per 10 guest rooms
Rooming or boarding houses	1 per 10 guest rooms
Bed and breakfast inns	1 per 10 guest rooms
Club/lodge	1 per 20 auto spaces
Institutional	
Welfare institution	not applicable
Correctional institution	1 per 30 auto spaces
Nursing home, care facility, sanitarium	1 per 30 auto spaces
Hospital	1 per 20 auto spaces
Park-and-ride lot	5 per acre, at least one of which is a locker
Transit center	5 per center, at least one of which is a locker
Parks and open space	1 per 10 auto spaces
Public parking lots	1 per 20 auto spaces
Automobile parking structures	1 per 20 auto spaces
Places of Public Assembly	
Religious institutions	1 per 20 auto spaces
Libraries, museums	1 per 10 auto spaces
Preschool, nursery, kindergarten	2 spaces
Elementary, junior high	4 per classroom
High school	2 per classroom
College, business/commercial schools	2 per classroom
Other auditorium/meeting room	1 per 20 auto spaces
Commercial Amusement	
Stadium, arena, theater	1 per 20 auto spaces
Bowling alley, skating rink, dance hall	1 per 15 auto spaces
Commercial	
Retail stores and shopping centers	1 per 20 auto spaces
Retail stores handling exclusively bulky merchandise such as automobile, boat or trailer sales or rental	1 per 40 auto spaces
Bank, office	1 per 20 auto spaces
Medical and dental clinic	1 per 20 auto spaces
Convenience food store	1 per 10 auto spaces

Furniture and appliance stores	1 per 40 auto spaces
Eating and drinking establishment,	1 per 20 auto spaces
Auto repair garage and gasoline service station	2 spaces
Mortuaries	not applicable
Swimming pools, gymnasiums, ball courts	1 per 10 auto spaces
Industrial	
Storage warehouse a	1 per 50 auto spaces
Manufacturing	1 per 40 auto spaces

17.52.090 Parking Lot Landscaping.

A. Purpose. The purpose of this code section includes the following:
1. To enhance and soften the appearance of parking lots;
2. To limit the visual impact of parking lots from sidewalks, streets and particularly from residential areas;
3. To shade and cool parking areas;
4. To reduce air and water pollution;
5. To reduce storm water impacts and improve water quality; and
6. To establish parking lots that are more inviting to pedestrians and bicyclists.

B. Development Standards. Parking lot landscaping is required for all uses, except for single- and two-family residential dwellings.
1. Perimeter Parking Lot Landscaping and Parking Lot Entryway/Right-of-way Screening. Parking lots shall include a 5-foot wide landscaped buffer where the parking lot abuts the right-of-way and/or adjoining properties. The perimeter parking lot are shall include:
   a. Trees spaced a maximum of thirty-five feet apart (minimum of one tree on either side of the entryway is required). When the parking lot is adjacent to a public right-of-way, the parking lot trees shall be offset from the street trees;
   b. Ground cover, such as wild flowers, spaced a maximum of 16-inches on center covering one hundred percent of the exposed ground within 3 years. No bark mulch shall be allowed except under the canopy of shrubs and within two feet of the base of trees; and .
   c. An evergreen hedge screen of thirty to forty-two inches high or shrubs spaced no more than four feet apart on average. The hedge/shrubs shall be parallel to and not nearer than two feet from the right-of-way line. The required screening shall be designed to allow for free access to the site and sidewalk by pedestrians. Visual breaks, no more than five feet in width, shall be provided every thirty feet within evergreen hedges abutting public right-of-ways.

   In order to provide connectivity between non-single-family sites, the Community Development Director may approve an interruption in the perimeter parking lot landscaping for a single driveway where the parking lot abuts property designated as multi-family, commercial or industrial. Shared driveways and parking aisles that straddle a lot line do not need to meet perimeter landscaping requirements.
2. Parking Area/Building Buffer. Parking areas shall be separated from the exterior wall of a structure, exclusive of pedestrian entranceways or loading areas, by one of the following:

a. Minimum five-foot wide landscaped planter strip (excluding areas for pedestrian connection) abutting either side of a parking lot sidewalk with:
   i. Trees spaced a maximum of thirty-five feet apart;
   ii. Ground cover such as wild flowers, spaced a maximum of 16-inches on center covering one hundred percent of the exposed ground within three years. No bark mulch shall be allowed except under the canopy of shrubs and within two feet of the base of trees; and
   iii An evergreen hedge of thirty to forty-two inches or shrubs placed no more than four feet apart on average; or
b. Seven-foot sidewalks with shade trees spaced a maximum of thirty-five feet apart in three-foot by five-foot tree wells.

3. Interior Parking Lot Landscaping. Surface parking lots shall have a minimum ten percent of the interior of the gross area of the parking lot devoted to landscaping to improve the water quality, reduce storm water runoff, and provide pavement shade. Interior parking lot landscaping shall not be counted toward the fifteen percent minimum total site landscaping required by Section 17.62.050(1). Pedestrian walkways or any impervious surface in the landscaped areas are not to be counted in the percentage.. Interior parking lot landscaping shall include:
   a. A minimum of one tree per six parking spaces.
   b. Ground cover, such as wild flowers, spaced a maximum of 16-inches on center covering one hundred percent of the exposed ground within three years. No bark mulch shall be allowed except under the canopy of shrubs and within two feet of the base of trees.
   c. Shrubs spaced no more than four feet apart on average.
   d. No more than eight contiguous parking spaces shall be created without providing an interior landscape strip between them. Landscape strips provided between rows of parking shall be a minimum of six feet in width to accommodate:
      i. Pedestrian walkways shall have shade trees spaced a maximum of every thirty-five feet in a minimum three-foot by five-foot tree wells; or
      ii. Trees spaced every thirty-five feet, shrubs spaced no more than four feet apart on average, and ground cover covering one hundred percent of the exposed ground. No bark mulch shall be allowed except under the canopy of shrubs and within two feet of the base of trees.
4. Alternative parking/landscaping plan. The city understands the physical constraints imposed upon small parking lots and encourages alternative designs for parking lots of less than 10 parking stalls. The Community Development Director may approve an alternative parking lot/landscaping plan with variations to the parking dimensions and landscaping standards for off-street parking. The alternative shall be consistent with the intent of this chapter and shall create a safe space for automobiles and pedestrians while retaining landscaping to the quantity and quality found within parking lot landscaping requirements. The landscaping plan shall be prepared by a licensed landscape architect.
5. The landscaping shall be located in defined landscaped areas that are uniformly distributed throughout the parking or loading area.
6. Parking lot trees shall be a mix of deciduous shade trees and coniferous trees. The trees shall be evenly distributed throughout the parking lot as both interior and perimeter landscaping to provide shade.
7. All areas in a parking lot not used for parking, maneuvering, or circulation shall be landscaped.

8. The landscaping in parking areas shall not obstruct lines of sight for safe traffic operation and shall comply with all requirements of Chapter 10.32, Traffic Sight Obstructions.
9. Landscaped areas shall include irrigation systems.
10. All plant materials, including trees, shrubbery and ground cover should be selected for their appropriateness to the site, drought tolerance, year-round greenery and coverage and staggered flowering periods. Species found on the Oregon City Native Plant List are strongly encouraged and species found on the Oregon City Nuisance Plant List are prohibited.
11. Landscaping shall incorporate design standards in accordance with Chapter 13.12, Stormwater Management.
12. Required landscaping trees shall be of a minimum two-inch minimum caliper size, planted according to American Nurseryman Standards, and selected from the Oregon City Street Tree List;

C. Installation.
1. All landscaping shall be installed according to accepted planting procedures, according to American Nurseryman Standards.
2. The site, soils and proposed irrigation systems shall be appropriate for the healthy and long-term maintenance of the proposed plant species.
3. Certificates of occupancy shall not be issued unless the landscaping requirements have been met or other arrangements have been made and approved by the city, such as the posting of a surety.

D. Maintenance.
1. The owner, tenant and their agent, if any, shall be jointly and severally responsible for the maintenance of all landscaping which shall be maintained in good condition so as to present a healthy, neat and orderly appearance and shall be kept free from refuse and debris.
2. All plant growth in interior landscaped areas shall be controlled by pruning, trimming, or otherwise so that:
   a. It will not interfere with the maintenance or repair of any public utility;
   b. It will not restrict pedestrian or vehicular access; and
   c. It will not constitute a traffic hazard due to reduced visibility.

Oregon City Municipal Code
Chapter 17.54 Supplemental Zoning Regulations and Exceptions

17.54.010 Accessory Buildings and Uses.

Accessory buildings and uses shall comply with all requirements for the principal use except where specifically modified by this title and shall comply with the following limitations:

A. Signs. Signs shall be permitted as provided in Chapter 15.28.

B. Accessory Buildings Dimensional Requirements. The following setbacks and other dimensional requirements shall apply to all accessory buildings and uses:

1. Building Footprint Less than Two Hundred Square Feet. An interior side or rear yard setback behind the front building line may be reduced to three feet for any detached accessory structure with a building footprint which is less than two hundred square feet in area and does not exceed a height of fourteen feet (measured from the average grade on the front of the structure to the midpoint of the roof). No portion of any such structure shall project across a lot line and the accessory structure shall be located behind the front building line of the primary structure. A building permit is required for accessory buildings over 10 feet in height (measured from the interior floor to the midpoint of the roof) or over 200 square feet in size.
2. Building Footprint from Two Hundred to Six Hundred Square Feet. The accessory building must be constructed with the same exterior building materials as that of the primary structure, or an acceptable substitute to be approved by the planning division. The accessory structure shall be located behind the front building line of the primary structure. The interior side and rear yard setbacks may be reduced to three feet for one accessory structure, and its projections, within this category provided the structure and its projections:
   a. Are detached and separated from other structures by at least three feet;
   b. Do not exceed a height of fourteen feet;
3. Building Footprint Over Six Hundred Square Feet. One accessory structure with a building footprint in excess of six hundred square feet may he approved by the planning division. An accessory structure footprint in excess of six hundred square feet must meet the setback requirements of the district in which it is located, and must also meet the following provisions:
   a. The accessory building must be compatible with the primary structure and constructed with the same exterior building materials as that of the primary structure, or an acceptable substitute to be approved by the planning division.
   b. The lot must be in excess of twenty thousand square feet.
   c. The building footprint of the accessory structure shall not exceed the building footprint of the primary structure. In no case may the accessory building footprint exceed eight hundred square feet.
   d. The accessory structure shall not exceed the height of the primary structure and shall be located behind the front building line of the primary structure.

C. Private Stable. A private stable may be permitted on a lot having a minimum area of twenty thousand square feet. The capacity of a stable shall not exceed one horse or other domestic hoofed animal for each twenty thousand square feet of lot area. A stable shall be located not less than twenty-five feet from any street line.

D. Swimming Pools. In-ground and above-ground swimming pools shall be constructed not less than three feet from the side or rear yard lines. Swimming pools shall comply with the front yard requirement for the principal building. A pool must be surrounded by a fence no less than four feet in height or a suitable alternative such as a locked or electric cover, approved by the Building Official

17.54.020 Projections from Buildings.

Ordinary building projections such as cornices, eaves, overhangs, canopies, sunshades, gutters, chimneys, flues, sills or similar architectural features may project into the required yards up to twenty-four inches.

17.54.030 Setback Exceptions.

Through lots having a frontage on two streets shall provide the required front yard on each street. The required rear yard is not necessary. (Prior code §11-4-3)

17.54.060 Seasonal Sales.

The following standards shall apply to seasonal outdoor sales which are limited to:

A. Fireworks Sales. The annual season for fireworks sales shall commence no sooner than June 23 and continue no longer than July 5.
   A business license shall be required pursuant to Title 5 of this code.
B. Christmas Tree and Wreath Sales. The annual season for Christmas tree and wreath sales shall commence no sooner than the day after Thanksgiving and shall continue no later than December 26.

A business license shall be required pursuant to Title 5 of this code.

17.54.090- Accessory Dwelling Units.

An accessory dwelling unit (ADU) is defined as a self-contained residential dwelling unit located on the same lot as a single-family dwelling, but is not a recreational vehicle. The habitable living unit provides basic living requirements including permanent cooking, and toilet facilities. It may be located either within the same building as the single-family dwelling unit or in a detached building.

A. The purpose of allowing an ADU is to:
   1. Provide homeowners with a means of obtaining, through tenants in the ADU or the principle dwelling unit, rental income, companionship, security, and services.
   2. Add affordable housing units to the existing housing inventory.
   3. Make housing units available to moderate-income people who might otherwise have difficulty finding homes within the City.
   4. Develop housing units in single-family neighborhoods that are appropriate for people at a variety of stages in the life cycle.
   5. Protect neighborhood stability, property values, and the single-family residential appearance of the neighborhood by ensuring that ADUs are installed under the conditions of this Section.
B. Standards and Criteria

An ADU shall meet the following standards and criteria:

   1. The design and size of the ADU shall conform to all applicable standards in the building, plumbing, electrical, mechanical, fire, health, and any other applicable codes.
   2. Any additions to the existing dwelling unit shall not encroach into the existing setbacks in the underlying zone. However, access structures (e.g. stairs or ramps) may be allowed within the setback if no access can be provided to the unit without encroaching into the setback area.
   3. The ADU may be attached to, or detached from, the principle dwelling unit.
   4. Only one ADU may be created per lot or parcel.
   5. The installation of an ADU shall be allowed in single-family zones subject to the specific development, design, and owner-occupancy standards in this section. ADUs are not permitted on the same lot as a nonconforming use.
   6. The ADU shall not exceed the height of the principle dwelling unit.
   7. The property owner, which shall include title holders and contract purchasers, must occupy either the principle dwelling unit or the ADU as their permanent residence, for at least 7 months out of the year, and at no time receive rent for the owner-occupied unit.

8. In no case shall an ADU:
    a. Be more than 40 percent of the principle dwelling unit's total floor area; nor
    b. Be more than 800 square feet; nor
    c. Be less than 300 square feet; nor
    d. Have more than 2 sleeping areas.
9. Detached ADUs:
    a. shall comply with the requirements OCMC Chapter 17.54.010 – Accessory Buildings and Uses including building footprint, height, placement, exterior building materials, etc.
    b. in the historic overlay district pursuant to OCMC chapter 17.40, shall be subject to the Design Guidelines for New Construction in Historic Districts.
10. The ADU shall be compatible with the principle dwelling unit, specifically in:
    a. Exterior finish materials.
        1. The exterior finish material must be the same as the principle dwelling unit; or
        2. Visually match in type, size and placement the exterior finish material of the principle dwelling unit.
    b. Trim must be the same in type, size, and location as the trim used on the principle dwelling unit.
    c. Windows must match those in the principle dwelling unit in proportion (relationship of width to height) and orientation (horizontal or vertical).
    d. Eaves must project from the building walls at the same proportion as the eaves on the principle dwelling unit.
11. Parking.
    a. Purpose. The parking requirements balance the need to provide adequate parking while maintaining the character of single-dwelling neighborhoods and reducing the amount of impervious surface on a site.
    b. The following parking requirements apply to accessory dwelling units.
    1. No additional parking space is required for the accessory dwelling unit if it is created on a site with a principle dwelling unit and the roadway for at least one abutting street is at least 28 feet wide.
    2. One additional parking space is required for the accessory dwelling unit as follows:
    i When none of the roadways in abutting streets are at least 28 feet wide; or
    ii When the accessory dwelling unit is created at the same time as the Principle Dwelling Unit.

C. Application Procedure

Application for a building permit for an ADU shall be made to the building official in accordance with the permit procedures established in OCMC 15.12, and shall include:

1. A letter of application from the owner(s) stating that the owner(s) shall occupy one of the dwelling units on the premises, except for bona fide temporary absences, for 7 months out of each year.
2. The registration application or other forms as required by the building official shall be filed as a deed restriction with Clackamas County Records Division to indicate the presence of the ADU, the requirement of owner-occupancy, and other standards for maintaining the unit as described above.
3. The building official shall report annually to the Community Development Director on ADU registration with the number of units and distribution throughout the City.
4. Cancellation of an ADU's registration may be accomplished by the owner filing a certificate with the building official for recording at the Clackamas County Records Division, or may occur as a result of enforcement action.

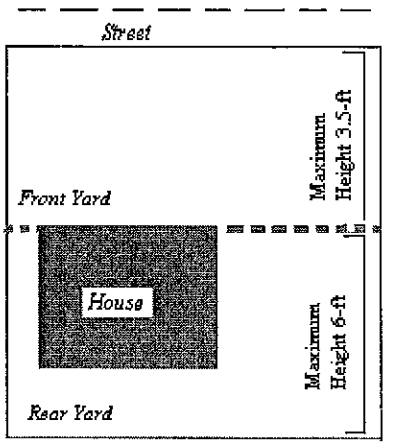
17.54.100 Fences.

Fence, Setback and Height Limitations

A fence may be located on the property or in a yard setback area subject to the following:

Any fence, hedge or wall located in front of your home may be up to 3.5-feet in total height.

fence, hedge or wall located next to and behind your home may be up to 6-feet in total height.



A. Generally. Fence, hedge, or wall.
   1. Fences and walls – Fences and walls over 42 inches shall not be located in front of the front faced or within 40 feet of the public right-of-way, whichever is less. All other fences (including fences along the side and rear of a property) shall not exceed 6 feet in total height unless as permitted in 17.54.100, Section (B).
   2. Hedges shall not be more than 42-inches in the underlying front yard setback
   3. Property owners shall ensure compliance with the Traffic Sight Obstruction requirements in Chapter 10.32 of the Oregon City Municipal Code.
   4. It is unlawful for any person to erect any electric fence or any fence constructed in whole or in part of barbed wire or to use barbed wire, except as erected in connection with security installations at a minimum height of six feet, providing further that prior written approval has been granted by the City Manager.

B. Exception. Fence, hedge, wall, or other obstructing vegetation on retaining wall. When a fence, hedge, wall, or other obstructing vegetation is built on a retaining wall or an artificial berm that is not adjacent to or abutting a public right-of-way, the following standards shall apply:
   1. When the retaining wall or artificial berm is 30 inches or less in height from the finished grade, the maximum fence or wall height on top of the retaining wall shall be six feet.
   2. When the retaining wall or earth berm is greater than 30 inches in height, the combined height of the retaining wall and fence or, wallfrom finished grade shall not exceed 8 ½ feet.
   3. Fences, hedges or walls located on top of retaining walls or earth bermsin excess of 8 ½ feet in height shall be setback a minimum of 2 feet from the edge of the retaining wall or earth berm below and shall not exceed a combined height of 8 ½ feet.
   4. An alternative height requirement may be approved within a land use process for all non-single-family and two-family residential properties. The fence, hedge or wall shall be compatible with the adjacent neighborhood and achieve the same intent of the zoning designation and applicable Site Plan and Design Review process. In no case may the fence, hedge or wall exceed 8 feet in height without approval of a variance.

17.54.105 Live/Work Units.

Live/work units provide important flexibility by combining residential and commercial uses and allowing for commercial uses on the ground floor when the market is ready to support them. These standards apply to all new live/work units. Live/work units that conform to the standards will be approved as a Type II Decision and a Live/work Permit will be granted for the property. For all zones were live/work units are permitted, the following standards shall apply. Conditions of approval may be implemented to ensure compliance with the standards.

A. The ground floor business has visibility, signage and access from the primary street. The building in which the live work dwelling is located shall architecturally differentiate the ground floor commercial/office space from the rest of the building by meet the following requirements:

1. The main front elevation sball provide at least fifty percent transparency at the pedestrian level through the use of a storefront system. The transparency is measured in lineal fashion (For example, a twenty-five foot long building elevation sball have at least twelve a half feet (50% of 25 feet) of transparency in length).
2. Windows shall begin 13 to 30 inches above the sidewalk rather than continue down to street level. Large single paned windows over 10 feet in width shall be divided into multiple panes to add human scale by dividing the vertical plane into smaller parts.
3. Highly reflective or glare-producing glass with a reflective factor of .25 or greater is prohibited on all building facades. Any glazing materials shall have a maximum fifteen (15) percent outside visual light reflectivity value. No exception shall be made for reflective glass styles that appear transparent when internally illuminated.

B. A live/work dwelling is allowed instead of, or in addition to, a home occupation as defined by OCMC 17.04.525. The business portion of the dwelling shall be limited to the ground floor and may not exceed 50 percent of the square footage of the entire dwelling, excluding the garage or 1000 square feet whichever is the smaller number.

C. The primary entrance to the business must be located on the primary street frontage. Alley access is required to provide refuse and recycling service and residential parking. If alley access cannot be provided an alternative parking and refuse and recycling service plan may be approved by the Community Development Director if it meets the intent of the standards.

D. The applicant must show that there is adequate on street or off-street parking for the proposed use. One parking space is required for every 500 square feet of commercial, personal service, or office use or a portion thereof. For example, 700 square feet of commercial use requires 2 parking spaces. Adequate parking can be shown by meeting one of the following:

1. Shared Parking. Required parking may be satisfied by the same parking facilities used jointly, to the extent that the owners or operators show that the need for parking facilities does not materially overlap (e.g., uses primarily of a daytime versus nighttime nature) or the live/work use is utilizing a parking space that is above the minimum parking requirement of the shared use, and that the shared parking facility is within 1,000 feet of the potential uses, and provided that the right of joint use is evidenced by a recorded deed, lease, contract, or similar written instrument establishing the joint use.
2. On-Street Parking. On-street parking dimensions for livework units shall conform to the standards set forth in OCMC 17.52010C
3. Onsite Parking. Parking spaces are provided onsite and meet the requirements of OCMC 17.52.-Offstreet Parking and Loading.

E. The number of employees permitted onsite for employment purposes shall be limited to 5 persons at one time.

F. The location of lots where live/work dwellings may be sited shall be specified on the subdivision plat (if applicable) and a deed restriction shall be placed on all units describing the restrictions placed upon these units These include, but are not limited to, the following:

1. The work use shall not generate noise exceeding 55-decibel level as measured at the lot line of the lot containing the live/work dwelling.
2. No outside storage of materials or goods related to the work occupation or business shall be permitted. Solid waste associated with the work use shall be stored inside the building and can be set out no more tban 4 hours before the solid waste pickup.
3. No dust or noxious odor shall be evident off the premises.
4. If the business is open to the public, public access must be through the front door and the business may not be open to clients or the public before 7:00 a.m. or after 8:00 p.m.

Oregon City Municipal Code
Chapter 17.56 Conditional Uses

17.56.010 Permit--Authorization--Standards--Conditions.

A conditional use listed in this title may be permitted, enlarged or altered upon authorization of the Planning Commission in accordance with the standards and procedures of this title. A conditional use permit listed in this section may be permitted, enlarged or altered upon authorization of the Planning Commission in accordance with the standards and procedures of this section. Any expansion to, alteration of, or accessory use to a conditional use shall require Planning Commission approval of a modification to the original conditional use permit.

A. The following conditional uses, because of their public convenience and necessity and their effect upon the neighborhood shall be permitted only upon the approval of the Planning Commission after due notice and public hearing, according to procedure as provided in Chapter 17.50. The Planning Commission may allow a conditional use, provided that the applicant provides evidence substantiating that all the requirements of this title relative to the proposed use are satisfied, and demonstrates that the proposed use also satisfies the following criteria:
   1. The use is listed as a conditional use in the underlying district;
   2. The characteristics of the site are suitable for the proposed use considering size, shape, location, topography, existence of improvements and natural features;
   3. The site and proposed development are timely, considering the adequacy of transportation systems, public facilities and services existing or planned for the area affected by the use;
   4. The proposed use will not alter the character of the surrounding area in a manner which substantially limits, impairs or precludes the use of surrounding properties for the primary uses listed in the underlying district;
   5. The proposal satisfies the goals and policies of the City Comprehensive Plan which apply to the proposed use.

B. Permits for conditional uses shall stipulate restrictions or conditions which may include, but are not limited to, a definite time limit to meet such conditions, provisions for a front, side or rear yard greater than the minimum dimensional standards of the zoning ordinance, suitable landscaping, off-street parking, and any other reasonable restriction, condition or safeguard that would uphold the spirit and intent of the zoning ordinance, and mitigate adverse effect upon the neighborhood properties by reason of the use, extension, construction or alteration allowed as set forth in the findings of the planning commission.

C. Any conditional use shall meet the dimensional standards of the zone in which it is to be located pursuant to subsection B of this section unless otherwise indicated, as well as the minimum conditions listed below.

D. In the case of a use existing prior to the effective date of the ordinance codified in this title and classified in this title as a conditional use, any change of use expansion of lot area or expansion of structure shall conform with the requirements for conditional use.

E. The Planning Commission may specifically permit, upon approval of a conditional use, further expansion to a specified maximum designated by the planning commission without the need to return for additional review.

17.56.020 Permit--Application.

A. A property owner or authorized agent shall initiate a request for a conditional use by filing an application with the city recorder. The applicant shall submit a site plan, drawn to scale, showing the dimensions and arrangement of the proposed development. The application shall be accompanied by the filing fee listed in Section 17.50.480 to defray the costs of publication, investigation and processing.

B. Before the planning commission may act on a conditional use application, it shall hold a public hearing thereon, following procedure as established in Chapter 17.50.

17.56.025 Minor Modifications to Legal Conditional Uses

Minor modifications to an approved conditional use permit may be permitted. If permitted, the modification shall be reviewed as a Minor Site Plan and Design Review. A minor modification to an approved conditional use permit is considered one of the following:

A. Modification to a structure for the purpose of enhancing the aesthetics of the building and there is no increase in the interior usable space;
B. A maximum addition of up to 1,000 square feet to a commercial, office, institutional, public, multi-family, or industrial building provided that the addition is not more than 35% of the original building square footage; or
C. Revisions to parking alignment and/or related vehicle circulation patterns.

17.56.040 Criteria and Standards for Conditional Uses.

In addition to the standards listed herein in Section 17.56.010, which are to be considered in the approval of all conditional uses and the standards of the zone in which the conditional use is located, the following additional standards shall be applicable:

A. Building Openings. The city may limit or prohibit building openings within fifty feet of residential property in a residential zone if the openings will cause glare, excessive noise or excessive traffic which would adversely affect adjacent residential property as set forth in the findings of the planning commission.
B. Additional Street Right-of-Way. The dedication of additional right-of-way may be required where the city plan indicates need for increased width and where the street is inadequate for its use; or where the nature of the proposed development warrants increased street width.
C. Public Utility or Communication Facility. Such facilities as a utility substation, water storage tank, radio or television transmitter, tower, tank, power transformer, pumping station and similar structures shall be located, designed and installed with suitable regard for aesthetic values. The base of these facilities shall not be located closer to the property line than a distance equal to the height of the structure. Hydroelectric generation facilities shall not exceed ninety megawatts of generation capacity.
D. Schools. The site must be located to best serve the intended area, must be in conformance with the city plan, must have adequate access, and must be in accordance with appropriate State standards.
E. Helipad Landing Facility. In evaluating a conditional use application for a helipad, the planning commission shall consider such matters as the following:
    1. Size of runways and landing areas;
    2. Approaches and obstructions within the runways and landing areas;
    3. Fencing and/or screening to provide visual and noise buffering and to deflect winds or blast due to aircraft operation;
    4. Fire protection measures and equipment;
    5. Night illumination adequate for operations, and its effects upon surrounding property;
    6. Landing markers;
    7. Structural adequacy of runways, pads and other structures;
    8. Paving and ground cover materials in relation to noise and down wash.
F. Residential Care Facilities.
    1. In addition to the general provisions of Section 17.56.020, any application shall include a description of the proposed use, including the number of residents and the nature of the condition or circumstances for which care, or a planned treatment or training program will be provided, the number of staff and the estimated length of stay per resident and the name of the agency responsible for regulating or sponsoring the use.
    2. Approval of a conditional use application for a residential care facility shall include the following minimum standards where applicable:
        a. The proposed facility shall maintain all applicable licenses required by the appropriate agencies for the use described in the application.
        b. All residential care facilities shall be subject to design review. Special considerations for this use are:
            i. Compatibility in appearance with the surrounding area;
            ii. Provisions of usable on-site open space appropriate to the needs of the residents and the nature of the care, treatment or training provided;
            iii. Clearly defined property boundaries.

G. Bed and Breakfast Inns. Upon approval of a conditional use application for a bed and breakfast inn, the planning commission shall include the following as additional standards and criteria:

1. The bed and breakfast inn shall maintain all applicable licenses required by governmental agencies for the use described in the application.
2. All bed and breakfast inns shall be subject to design review. Special considerations for this use are:
   a. Compatibility of the structure in appearance with the surrounding area;
   b. Compatibility of the parking facilities in appearance and circulation of traffic with the surrounding area. Parking facilities shall also comply with Chapter 17.52;
   c. Compatibility of the signage in appearance with the surrounding area. Signage shall also comply with Chapter 15.28;
   d. The number of rooms to be used as overnight public accommodations shall not exceed four rooms in an underlying residential zone, or seven rooms in an underlying nonresidential zone;
   e. The owner/operators shall reside in the bed and breakfast inn, or in a residence adjacent to the bed and breakfast inn.
   f. The Planning Commission may allow up to an additional 6 non-guests to be served along with the guests at a meal.

17.56.060 Revocation of Conditional Use Permits.

The Planning Commission or the City Commission may initiate administrative action under Chapter 17.50 to revoke any conditional use permit previously issued by the city or, with regard to lands annexed by the city, those such permits issued by the county. The Planning Commission or, on review, the City Commission, may revoke such permit upon determining:

A. One or more conditions attached to the grant of the conditional use permit have not been fulfilled; and

B. The unfulfilled condition is substantially related to the issuance of the conditional use permit.

17.56.070 Periodic Review of Conditional Use Permits.

A. The City Commission may provide for the periodic review of some or all of the conditional use permits previously issued by the city, or, with regard to lands annexed by the city, those such permits issued by the county. In providing for such review, the City Commission may designate classes of such previously issued permits for which periodic review shall be undertaken.

B. Such review shall be accomplished as an administrative action under Chapter 17.50 and shall be limited to the question of whether additional conditions should be imposed on a conditional use in the light of changing circumstances and more efficient implementation of the city's comprehensive plan.

C. Notwithstanding the provisions of Chapter 17.58, any additional conditions shall be met as a requirement for continued operation of the conditional use.

Oregon City Municipal Code
Chapter 17.58 – Lawful Nonconforming Uses, Structures and Lots

17.58.010 Purpose.

Nonconforming situations are created when the application of zoning district to a site changes or the zoning regulations change. As part of the change, existing uses, density, or development might no longer be allowed or are further restricted. Nonconforming uses, structures and lots are those uses, structures and lots that were lawfully established but do not conform to the provisions of this title or the provisions of the zoning district in which the use, structure or lot is located. The intent of these provisions is not to force all non-conforming situations immediately to be brought into conformance. Instead, the intent is to guide nonconforming situations in a new direction consistent with City policy, and, eventually, bring them into conformance.

17.58.015 Applicability.

The regulations of this chapter apply only to those nonconforming situations that were lawfully established or that were approved through a land use decision. All nonconforming structures, uses or lots shall have been maintained over time. These situations have lawful nonconforming status. Nonconforming situations that were not allowed when established or have not been maintained over time have no lawful right to continue.

17.58.020 Lawful Nonconforming Lots of Record.

Lots or parcels lawfully created but which do not now conform to the legal lot standards in this land use code may be occupied by uses otherwise permitted if those uses comply with all other provisions of this land use code.

17.58.030 Lawful Nonconforming Use.

A use that was lawfully established on a particular development site but that no longer complies with the allowed uses or the standards for those uses in this title may be considered a lawful nonconforming use. Change of ownership, tenancy, or management of a lawfully established nonconforming use shall not affect its lawful nonconforming status. The continuation of a lawful nonconforming use is subject to the following:

A. Discontinuance. If a lawful nonconforming use is discontinued for a period of one year, it shall lose its lawful nonconforming status and the use of the property thereafter shall conform with the existing provisions of this title. If a nonconforming use ceases operations, even if the structure or materials related to the use remain, the use shall be deemed to have been discontinued.
B. Conformance. If a lawful nonconforming use is converted to a conforming use, no nonconforming use may be resumed.
C. Destruction of a Non-Residential Use. When a structure containing a lawful nonconforming non-residential use is damaged by fire or other causes, the re-establishment of the nonconforming use shall be prohibited if the repair cost of the structure is more then 60 percent of its assessed value.
D. Destruction of a Residential Use. When a structure containing a lawful nonconforming residential use is damaged by fire or other causes, the re-establishment of the nonconforming use shall be permitted.
E. Intentional Destruction. When a structure containing a nonconforming use is removed or intentionally damaged by fire or other causes within the control of the owner, the re-establishment of the nonconforming use shall be prohibited.

F. Expansion. No lawful nonconforming use may be replaced by a different type of nonconforming use, nor may any legal nonconforming use be expanded or intensified.

17.58.040 Lawful Nonconforming Structure.

A structure that was lawfully established but no longer conforms to all development standards of this land use code (such as setbacks) shall be considered a lawful nonconforming structure. Notwithstanding development standard requirements in this code, minor repairs and routing maintenance of a lawful nonconforming structure are permitted. The continuation of a lawful nonconforming structure is subject to the following:

A. Accidental Destruction. When a nonconforming structure is damaged by fire or other causes, the structure may be rebuilt using the same structure footprint.

B. Intentional Destruction. When a nonconforming structure is removed or intentionally damaged by fire or other causes within the control of the owner, the replacement structure shall comply with the development standards of this title.

C. Expansion. An expansion of a lawful nonconforming structure may be approved, conditionally approved or denied in accordance with the standards and procedures of this section.
   1. In making a determination on such applications, the decision maker shall weigh the proposal's positive and negative features and the public convenience or necessity to be served against any adverse conditions that would result from authorizing the particular development at the location proposed, and, to approve such expansion, it must be found that the criteria identified in section 17.58.060 have either been met, can be met by observance of conditions, or are not applicable.
   2. An expansion of a nonconforming structure with alterations that exceed the threshold of Subparagraph C.2.a below shall comply with the development standards listed in Subparagraph C.2.b. The value of the alterations and improvements is based on the entire project and not individual building permits.
      a. Thresholds triggering compliance. The standards of Subparagraph C.2.b below shall be met when the value of the proposed exterior alterations or additions to the site, as determined by the Community Development Director, is more then $75,000. The following alterations and improvements shall not be included in the threshold calculation:
         (1) Proposed alterations to meet approved fire and life safety agreements;
         (2) Alterations related to the removal of existing architectural barriers, as required by the Americans with Disabilities Act, or as specified in Section 1113 of the Oregon Structural Specialty Code;
         (3) Alterations required to meet Seismic Design Requirements; and
         (4) Improvements to on-site stormwater management facilities in conformance with Oregon City Stormwater Design Standards.
      b. Standards that shall be met. Developments not complying with the development standards listed below shall be brought into conformance.
         (1) Pedestrian circulation systems, as set out in the pedestrian standards that apply to the sites;
         (2) Minimum perimeter parking lot landscaping;
         (3) Minimum interior parking lot landscaping;
         (4) Minimum site landscaping requirements;
         (5) Bicycle parking by upgrading existing racks and providing additional spaces in order to comply with 17.52 Off-Street Parking and Loading;
         (6) Screening; and
         (7) Paving of surface parking and exterior storage and display areas.
      c. Area of required improvements.
         (1) Generally. Except as provided in C.2.c(2) below, required improvements shall be made for the entire site.

(2) Exception for sites with ground leases. Required improvements may be limited to a smaller area if there is a ground lease for the portion of the site where the alterations are proposed. If all of the following are met, the area of the ground lease will be considered as a separate site for purposes of required improvements. The applicant shall meet the following:

i. The signed ground lease – or excerpts from the lease document satisfactory to the City Attorney – shall be submitted to the Community Development Director. The portions of the lease shall include the following:

- The term of the lease. In all cases, there must be at least one year remaining on the ground lease; and
- A legal description of the boundaries of the lease.

ii. The boundaries of the ground lease shall be shown on the site plan submitted with the application. The area of the lease shall include all existing and any proposed development that is required for, or is used exclusively by, those uses within the area of the lease; and

iii. Screening shall not be required along the boundaries of ground leases that are interior to the site.

d. Timing and cost of required improvements. The applicant may choose one of the two following options for making the required improvements:

(1) Option 1. Required improvements may be made as part of the alteration that triggers the required improvements. The cost of the standards that shall be met, identified in Subparagraph C.2.b above, is limited to 10% of the value of the proposed alterations. It is the responsibility of the applicant to document to the Community Development Director the value of the required improvements. Additional costs may be required to comply with other applicable requirements associated with the proposal. When all required improvements are not being made, the priority for the improvements shall be as listed in Subparagraph C.2.b above.

(2) Option 2. Required improvements may be made over several years, based on the compliance period identified in Table 17.58 – 1 below. However, by the end of the compliance period, the site shall be brought fully into compliance with the standards listed in Subparagraph C.2.b. Where this option is chosen, the following must be met:

i. Before a building permit is issued, the applicant shall submit the following to the Community Development Director:

- A Nonconforming Development Assessment, which identifies in writing and on a site plan, all development that does not meet the standards listed in Subparagraph C.2.b.
- A covenant, in a form approved by the City Attorney, executed by the property owner that meets the requirements of 17.50.150. The covenant shall identify development on the site that does not meet the standards listed in Subparagraph C.2.b, and require the owner to bring that development fully into compliance with this Title. The covenant shall also specify the date by which the owner will be in conformance. The date must be within the compliance periods set out in Table 17.58 – 1.

ii. The nonconforming development identified in the Nonconforming Development Assessment shall be brought into full compliance with the requirements of this Title within the following compliance periods. The compliance period begins when a building permit is issued for alterations to the site of more than $75,000. The compliance periods are based on the size of the site (see Table 17.58 – 1 below).

iii. By the end of the compliance period, the applicant or owner shall request that the site by certified by the Community Development Director as in compliance. If the request

is not received within that time, or if the site is not fully in conformance, no additional building permits will be issued.

iv. If the regulations referred to by Subparagraph C.2.b are amended after the Nonconforming Development Assessment is received by the Community Development Director, and those amendments result in development on the site that was not addressed by the Assessment becoming nonconforming, the applicant shall address the new nonconforming development using Option 1 or 2. If the applicant chooses Option 2, a separate Nonconforming Development Assessment, covenant and compliance period will be required for the new nonconforming development.

Table 17.58 – 1
Compliance Periods for Option 2

Square footage of site	**Compliance Period**
Less than 150,000 sq. ft.	2 years
150,000 sq. ft. or more, up to 300,000 sq. ft.	3 years
300,000 sq. ft. or more, up to 500,000 sq. ft.	4 years
More than 500,000 sq. ft.	5 years

17.58.060 Process to Confirm the Legality of a Nonconforming Use, Lot or Structure.

Any person may request a Type I or a Type II review to confirm the legality of a nonconforming use, lot or structure. In order to confirm that the nonconforming use, lot or structure is legal, sufficient evidence shall be submitted to the City determining the following:

A. The nonconforming use or structure was established lawfully; and

B. The nonconforming use or structure has not become more nonconforming within the past 20 years from the date of application.

The applicant shall provide sufficient evidence to allow the Community Development Director to review and confirm the legality of a nonconforming use, lot or structure. An applicant may request a Type I procedure, provided the applicant can provide sufficient evidence to confirm 17.58.060.A and B without discretion. If the applicant cannot provide sufficient evidence to determine 17.58.060.A and B without discretion, the applicant may apply for a Type II procedure. Applications for Type II procedures shall be noticed to the public in a public comment period to gather additional information. If the applicant cannot show that the non-conforming use, lot or structure was lawfully established or has not been expanded pursuant to 17.58.060 A and B above, the use, lot or structure shall be determined to be illegal.

Oregon City Municipal Code
Chapter 17.60 Variances

17.60.010 Authority.

According to procedures set forth in Section 17.60.030, the planning commission or the Community Development Director may authorize variances from the requirements of this title. In granting a variance, the Planning Commission or Community Development Director may attach conditions to protect the best interests of the surrounding property or neighborhood and otherwise achieve the purposes of this title. No variances shall be granted to allow the use of property for a purpose not authorized within the zone in which the proposed use would be located.

17.60.020 Variances--Procedures.

A. A request for a variance shall be initiated by a property owner or authorized agent by filing an application with the city recorder. The application shall be accompanied by a site plan, drawn to scale, showing the dimensions and arrangement of the proposed development. When relevant to the request, building plans may also be required. The application shall note the zoning requirement and the extent of the variance requested. Procedures shall thereafter be held under Chapter 17.50. In addition, the procedures set forth in subsection D of this section shall apply when applicable.
B. A nonrefundable filing fee, as listed in Section 17.50.480, shall accompany the application for a variance to defray the costs.
C. Before the planning commission may act on a variance, it shall hold a public hearing thereon following procedures as established in Chapter 17.50. A Variance shall address the criteria identified in Section 17.60.030 Variances – Grounds.
D. Minor variances, as defined in subsection E of this section, shall be processed as a Type II decision, shall be reviewed pursuant to the requirements in Section 17.50.030(B), and shall address the criteria identified in Section 17.60.030 Variance - Grounds.
E. For the purposes of this section, minor variances shall be defined as follows:
    1. Variances to setback and yard requirements to allow additions to existing buildings so that the additions follow existing building lines;
    2. Variances to width, depth and frontage requirements of up to 20%;
    3. Variances to residential yard/setback requirements of up to 25%,
    4. Variances to nonresidential yard/setback requirements of up to 10%;
    5. Variances to lot area requirements of up to 5%;
    6. Variance to lot coverage requirements of up to 25%
    7. Variances to the minimum required parking stalls of up to 5%; and
    8. Variances to the Floor Area Requirements and minimum required Building Height in the Mixed Use Districts.

17.60.030 Variance – Grounds.

A variance may be granted only in the event that all of the following conditions exist:
A. That the variance from the requirements is not likely to cause substantial damage to adjacent properties by reducing light, air, safe access or other desirable or necessary qualities otherwise protected by this title;
B. That the request is the minimum variance that would alleviate the hardship;
C. Granting the variance will equal or exceed the purpose of the regulation to be modified.
D. Any impacts resulting from the adjustment are mitigated;
E. No practical alternatives have been identified which would accomplish the same purpose and not require a variance; and
F. The variance conforms to the Comprehensive Plan and the intent of the ordinance being varied.

Oregon City Municipal Code
Chapter 17.62 SITE PLAN & DESIGN REVIEW

17.62.010 Purpose.

The purposes of site plan and design review are to: encourage site planning in advance of construction; protect lives and property from potential adverse impacts of development; consider natural or man-made hazards which may impose limitations on development; conserve the City's natural beauty and visual character and minimize adverse impacts of development on the natural environment as much as is reasonably practicable; assure that development is supported with necessary public facilities and services; ensure that structures and other improvements are properly related to their sites and to surrounding sites and structure; and implement the city's comprehensive plan and land use regulations with respect to development standards and policies.

17.62.0015 Modifications That Will Better Meet Design Review Requirements.

The review body may consider modification of site-related development standards. These modifications are done as part of design review and are not required to go through the Variance process pursuant to section 17.62.020. Adjustments to use-related development standards (such as floor area ratios, intensity of use, size of the use, number of units, or concentration of uses) are required to go through the Variance process pursuant to section 17.62.020. Modifications that are denied through design review may be requested as Variance through the Variance process pursuant to section 17.62.020. The review body may approve requested modifications if it finds that the applicant has shown that the following approval criteria are met:

A. The modification will result in a development that better meets design guidelines; and
B. The modification meets the intent of the standard. On balance, the proposal will be consistent with the purpose of the standard for which a modification is requested.

17.62.020 Preapplication Conference.

Prior to filing for site plan and design review approval, the applicant shall confer with the Community Development Director pursuant to Section 17.50.030. The Community Development Director shall identify and explain the relevant review procedures and standards.

17.62.030 When Required.

Site plan and design review shall be required for all development of real property in all zones except the R-10, R-8, R-6, R-5 and R-3.5 zoning districts, unless otherwise provided for by this title or as a condition of approval of a permit. Site plan and design review shall also apply to all conditional uses, cottage housing development, multi-family and non-residential uses in all zones. No building permit or other permit authorization for development shall be issued prior to site plan and design review approval. Parking lots and parking areas accessory to uses regulated by this chapter also shall require site plan and design review approval. Site plan and design review shall not alter the type and category of uses permitted in zoning districts.

17.62.035 Minor Site Plan and Design Review.

This section provides for a minor site plan and design review process. This section is a Type II decision subject to administrative proceedings described in OCMC 17.50. This section may be utilized as the appropriate review process only when authorized by the community development director. The purpose of

this type of review is to expedite design review standard for uses and activities that require only a minimal amount of review, typical of minor modifications and/or changes to existing uses or buildings.

A. Generally. Minor site plan and design review applies to the following uses and activities:
   1. Modification of an office, commercial, industrial, institutional, public or multi-family structure for the purpose of enhancing the aesthetics of the building and not increasing the interior usable space (for example covered walkways or entryways, addition of unoccupied features such as clock tower, etc.).
   2. A maximum addition of up to one thousand square feet to a commercial, office, institutional, public, multi-family, or industrial building provided that the addition is not more than thirty-five percent of the original building square footage.
   3. Other land uses and activities may be added if the Community Development Director makes written findings that the activity/use will not increase off-site impacts and is consistent with the type and/or scale of activities/uses listed above.

B. Application. The application for the minor site plan and design review shall contain the following elements:
   1. the submittal requirements of Chapter 17.50.
   2. A narrative explaining all aspects of the proposal in detail and addressing each of the criteria listed in Section 17.62.035(C) below.
   3. Site plan drawings showing existing conditions/uses and proposed conditions/uses.
   4. Architectural drawings, including building elevations and envelopes, if architectural work is proposed.
   5. Additional submittal material may be required by the Community Development Director on a case-by-case basis.

C. Development Standards for Minor Site Plan and Design Review.
   1. All development shall comply with Section 17.62.050(1-6 and 8-15) when deemed applicable by the Community Development Director. The Community Development Director may add conditions of approval to ensure the proposed modification meets the requirements and standards of site plan and design review.

17.62.040 Plans Required.

A complete application for site plan and design review shall be submitted. Except as otherwise in subsection I of this section, the application shall include the following plans and information:

A. A site plan or plans, to scale, containing the following:
   1. Vicinity information showing streets and access points, pedestrian and bicycle pathways, transit stops and utility locations;
   2. The site size, dimensions, and zoning, including dimensions and gross area of each lot or parcel and tax lot and assessor map designations for the proposed site and immediately adjoining properties;
   3. Contour lines at two foot contour intervals for grades zero to ten percent, and five-foot intervals for grades over ten percent;
   4. The location of natural hazard areas on and within one hundred feet of the boundaries of the site, including:
      a. Areas indicated on floodplain maps as being within the one hundred-year floodplain,
      b. Unstable slopes, as defined in Section 17.44.020,
      c. Areas identified on the seismic conditions map in the comprehensive plan as subject to earthquake and seismic conditions;
   5. The location of natural resource areas on and within one hundred feet of the boundaries of the site, including fish and wildlife habitat, existing trees (six inches or greater in caliper measured four feet above ground level), wetlands, streams, natural areas, wooded areas, areas of significant trees or vegetation, and areas designated as being within the natural resources overlay district;
   6. The location of inventoried historic or cultural resources on and within one hundred feet of the boundaries of the site;

7. The location, dimensions, and setback distances of all existing permanent structures, improvements and utilities on or within twenty-five feet of the site, and the current or proposed uses of the structures;
8. The location, dimensions, square footage, building orientation and setback distances of proposed structures, improvements and utilities, and the proposed uses of the structures by square footage;
9. The location, dimension and names, as appropriate, of all existing and platted streets, other public ways, sidewalks, bike routes and bikeways, pedestrian/bicycle accessways and other pedestrian and bicycle ways, transit street and facilities, neighborhood activity centers, and easements on and within two hundred fifty feet of the boundaries of the site;
10. The location, dimension and names, as appropriate, of all proposed streets, other public ways, sidewalks, bike routes and bikeways, pedestrian/bicycle accessways and other pedestrian and bicycle ways, transit streets and facilities, neighborhood activity centers, and easements on and within two hundred fifty feet of the boundaries of the site;
11. All parking, circulation, loading and servicing areas, including the locations of all carpool, vanpool and bicycle parking spaces as required in Chapter 52 of this title;
12. Site access points for automobiles, pedestrians, bicycles and transit;
13. On-site pedestrian and bicycle circulation;
14. Outdoor common areas proposed as open space;
15. Total impervious surface created (including buildings and hard ground surfaces).
16. The proposed location, dimensions and materials of fences and walls.

B. A landscaping plan, drawn to scale, showing the location and types of existing trees (six inches or greater in caliper measured four feet above ground level) and vegetation proposed to be removed and to be retained on the site, the location and design of landscaped areas, the varieties, sizes and spacings of trees and plant materials to be planted on the site, other pertinent landscape features, and irrigation systems required to maintain plant materials.

C. Architectural drawings or sketches, drawn to scale and showing floor plans, elevations accurately reflected to grade, and exterior materials of all proposed structures and other improvements as they will appear on completion of construction.

D. A materials board, no longer in size than eight and one-half inches by fourteen inches clearly depicting all building materials with specifications as to type, color and texture of exterior materials of proposed structures.

E. An erosion/sedimentation control plan, in accordance with the requirements of Chapter 17.47 and the Public Works Erosion and Sediment Control Standards, and a drainage plan developed in accordance with city drainage master plan requirements, Chapter 13.12 and the Public Works Stormwater and Grading Design Standards. The drainage plan shall identify the location of drainage patterns and drainage courses on and within one hundred feet of the boundaries of the site. Where development is proposed within an identified hazard area, these plans shall reflect concerns identified in the hydrological/geological/ geotechnical development impact statement.

F. The legal description of the site.

G. An exterior lighting plan, drawn to scale, showing type, height, and area of illumination.

H. Such special studies or reports as the Community Development Director may require to obtain information to ensure that the proposed development does not adversely affect the surrounding community or identified natural resource areas or create hazardous conditions for persons or improvements on the site. The Community Development Director shall require an applicant to submit one or more development impact statements, as described in Section 16.12.050, upon determination that (1) there is a reasonable likelihood that traffic safety or capacity improvements may be required; (2) the proposal could have significant adverse impacts on identified natural resource areas, including areas designated as being within the natural resources overlay district; or (3) the proposal would be located on or could have significant adverse impacts on natural hazard areas, including the geologic hazard and flood plain overlay districts. The Community Development Director shall determine which types of development impact statements are necessary and provide written reasons for requiring the statement(s).

The development impact statements shall include the information described in Sections 16.12.070, 16.12.080, and 16.12.120. 17.62.040

I. The Community Development Director may waive the submission of information for specific requirements of this section or may require information in addition to that required by a specific provision of this section, as follows:

1. The Community Development Director may waive the submission of information for a specific requirement upon determination either that specific information is not necessary to evaluate the application properly, or that a specific approval standard is not applicable to the application. If submission of information is waived, the Community Development Director shall, in the decision, identify the waived requirements, explain the reasons for the waiver, and state that the waiver may be challenged on appeal and may be denied by a subsequent review authority. If the matter is forwarded to the planning commission for initial review, the information required by this paragraph shall be included in the staff report;
2. The Community Development Director may require information in addition to that required by a specific provision of this section upon determination that the information is needed to evaluate the application properly and that the need can be justified on the basis of a special or unforseen circumstance. If additional information is required, the Community Development Director shall, in the decision, explain the reasons for requiring the additional information.

J. If the applicant has not already done so as some other part of the land use review process, the applicant shall submit an erosion control plan that complies with the applicable requirements of Chapter 17.74 of this code.

17.62.050 Standards.

A. All development shall comply with the following standards:

1. Landscaping, A minimum of fifteen percent of the lot area being developed shall be landscaped. Natural landscaping comprised of native species shall be retained to meet the landscaping requirement. All invasive species, such as Himalayan Blackberry and English Ivy shall be removed onsite prior to building final. Except as allowed elsewhere in the Zoning and Land Division Chapters of this code, all areas to be credited towards landscaping must be installed with growing plant materials. Pursuant to Chapter 17.49, landscaping requirements within the Natural Resource Overlay District, other than landscaping required for parking lots, may be met by preserving, restoring and permanently protecting native vegetation and habitat on development sites. The landscaping plan shall be prepared by a registered landscape architect and include a mix of vertical (trees and shrubs) and horizontal elements (grass, groundcover, etc.) that within 3 years will cover 100% of the Landscape area. No mulch, bark chips, or similar materials shall be allowed at the time of landscape installation except under the canopy of shrubs and within two feet of the base of trees. The Community Development Department shall maintain a list of trees, shrubs and vegetation acceptable for landscaping. For properties within the downtown design district, and for major remodeling in all zones subject to this chapter, landscaping shall be required to the extent practicable up to the fifteen percent requirement. Landscaping also shall be visible from public thoroughfares to the extent practicable. Interior parking lot landscaping shall not be counted toward the fifteen percent minimum.
2. Vehicular Access and Connectivity
    a. Parking areas shall be located behind buildings, below buildings, or on one or both sides of buildings.
    b. Ingress and egress locations on public thoroughfares shall be located in the interest of public safety. Access for emergency services (fire and police) shall be provided.
    c. Alleys or vehicular access easements shall be provided in the following Districts: R-2, MUC-1, MUC-2, MUD and NC zones unless other permanent provisions for access to off-street parking and loading facilities are approved by the decision-maker. The corners of alley intersections shall have a radius of not less than ten feet.

d. On corner lots, the driveway(s) shall be located off of the side street (unless the side street is an arterial) and away from the street intersection
e. Sites abutting an alley shall be required to gain vehicular access from the alley.
f. Where no alley access is available, the development shall be configured to allow only one driveway per frontage. Shared driveways shall be required as needed to accomplish the requirements of this section. The driveway shall be located to one side of the lot and away from the center of the site. The location and design of pedestrian access from the public sidewalk shall be emphasized so as to be clearly visible and distinguishable from the vehicular access to the site. Special landscaping, paving, lighting, and architectural treatments may be required to accomplish this requirement
g. Development of large sites (more than 2 acres) shall be required to provide existing or future connections to adjacent sites through the use of a vehicular and pedestrian access easements where applicable.
h. Parking garage entries (both individual, private and shared parking garages) shall not dominate the streetscape. They shall be designed and situated to be ancillary to the use and architecture of the ground floor. This standard applies to both public garages and any individual private garages, whether they front on a street or private interior access road.
i. Buildings containing above-grade structured parking shall screen such parking areas with landscaping or landscaped berms, or incorporate contextual architectural elements that complement adjacent buildings or buildings in the area. Upper level parking garages shall use articulation or fenestration treatments that break up the massing of the garage and/or add visual interest.

3. Building structures shall be complimentary to the surrounding area. All exterior surfaces shall present a finished appearance. All sides of the building shall include materials and design characteristics consistent with those on the front. Use of inferior or lesser quality materials for side or rear facades or decking shall be prohibited.
   a. Alterations, additions and new construction located within the McLoughlin Conservation District, Canemah National Register District, and the Downtown Design District and when abutting a designated Historic Landmark shall utilize materials and a design that incorporates the architecture of the subject building as well as the surrounding district or abutting Historic Landmark. Historic materials such as doors, windows and siding shall be retained or replaced with in kind materials unless the Community Development Director determines that the materials cannot be retained and the new design and materials are compatible with the subject building, and District or Landmark. The Community Development Director may utilize the Historic Review Board's Guidelines for New Constriction (2006) to develop findings to show compliance with this section.
   b. In historic areas and where development could have a significant visual impact, the review authority may request the advisory opinions of appropriate experts designated by the Community Development Director from the design fields of architecture, landscaping and urban planning. The applicant shall pay the costs associated with obtaining such independent professional advice; provided, however, that the review authority shall seek to minimize those costs to the extent practicable.
4. Grading shall be in accordance with the requirements of Chapter 15.48 and the public works stormwater and grading design standards.
5. Development subject to the requirements of the Geologic Hazard overlay district shall comply with the requirements of that district.
6. Drainage shall be provided in accordance with city's drainage master plan, Chapter 13.12, and the public works stormwater and grading design standards.
7. Parking, including carpool, vanpool and bicycle parking, shall comply with city off-street parking standards, Chapter 17.52.
8. Sidewalks and curbs shall be provided in accordance with the city's transportation master plan and street design standards. Upon application, the Community Development Director may waive this

requirement in whole or in part in those locations where there is no probable need, or comparable alternative location provisions for pedestrians are made.

9. A well-marked, continuous and protected on-site pedestrian circulation system meeting the following standards shall be provided:
   a. Pathways between all building entrances and the street are required. Pathways between the street and buildings fronting on the street shall be direct. Exceptions may be allowed by the Director where steep slopes or protected natural resources prevent a direct connection or where an indirect route would enhance the design and/or use of a common open space.
   b. The pedestrian circulation system shall connect all main entrances on the site. For buildings fronting on the street, the sidewalk may be used to meet this standard. Pedestrian connections to other areas of the site, such as parking areas, recreational areas, common outdoor areas, and any pedestrian amenities shall be required.
   c. Elevated external stairways or walkways, that provide pedestrian access to multiple dwelling units located above the ground floor of any building are prohibited. The Community Development Director may allow exceptions for external stairways or walkways located in, or facing interior courtyard areas provided they do not compromise visual access from dwelling units into the courtyard.
   d. The pedestrian circulation system shall connect the main entrances of adjacent buildings on the same site.
   e. The pedestrian circulation system shall connect the principal building entrance to those of buildings on adjacent commercial and residential sites where practicable. Walkway linkages to adjacent developments shall not be required within industrial developments or to industrial developments or to vacant industrially-zoned land.
   f. On-site pedestrian walkways shall be hard surfaced, well drained and at least five feet wide. Surface material sball contrast visually to adjoining surfaces. When bordering parking spaces other than spaces for parallel parking, pedestrian walkways shall be a minimum of seven feet in width unless curb stops are provided. When the pedestrian circulation system is parallel and adjacent to an auto travel lane, the walkway shall be raised or separated from the auto travel lane by a raised curb, bollards, landscaping or other physical barrier. If a raised walkway is used, the ends of the raised portions shall be equipped with curb ramps for each direction of travel. Pedestrian walkways that cross drive isles or other vehicular circulation areas shall utilize a change in textual material or height to alert the driver of the pedestrian crossing area.
10. There shall be provided adequate means to ensure continued maintenance and necessary normal replacement of private common facilities and areas, drainage ditches, streets and other ways, structures, recreational facilities, landscaping, fill and excavation areas, screening and fencing, groundcover, garbage storage areas and other facilities not subject to periodic maintenance by the city or other public agency.
11. Site planning shall conform to the requirements of OCMC Chapter 17.41 Tree Protection
12. Development shall be planned, designed, constructed and maintained to protect water resources and habitat conservation areas in accordance with the requirements of the city's Natural Resources Overlay District, Chapter 17.49, as applicable.
13. All development shall maintain continuous compliance with applicable federal, state, and city standards pertaining to air and water quality, odor, heat, glare, noise and vibrations, outdoor storage, radioactive materials, toxic or noxious matter, and electromagnetic interference. Prior to issuance of a building permit, the Community Development Director or building official may require submission of evidence demonstrating compliance with such standards and receipt of necessary permits. The review authority may regulate the hours of construction or operation to minimize adverse impacts on adjoining residences, businesses or neighborhoods. The emission of odorous gases or other matter in such quantity as to be readily detectable at any point beyond the property line of the use creating the odors or matter is prohibited.
14. Adequate public water and sanitary sewer facilities sufficient to serve the proposed or permitted level of development shall be provided. The applicant shall demonstrate that adequate facilities and

services are presently available or can be made available concurrent with development. Service providers shall be presumed correct in the evidence, which they submit. All facilities shall be designated to city standards as set out in the city's facility master plans and public works design standards. A development may be required to modify or replace existing offsite systems if necessary to provide adequate public facilities. The city may require over sizing of facilities where necessary to meet standards in the city's facility master plan or to allow for the orderly and efficient provision of public facilities and services. Where over sizing is required, the developer may request reimbursement from the city for over sizing based on the city's reimbursement policy and fund availability, or provide for recovery of costs from intervening properties as they develop.

15. Adequate right-of-way and improvements to streets, pedestrian ways, bike routes and bikeways, and transit facilities shall be provided and be consistent with the city's transportation master plan and design standards and this title. Consideration shall be given to the need for street widening and other improvements in the area of the proposed development impacted by traffic generated by the proposed development. This shall include, but not be limited to, improvements to the right-of-way, such as installation of lighting, signalization, turn lanes, median and parking strips, traffic islands, paving, curbs and gutters, sidewalks, bikeways, street drainage facilities and other facilities needed because of anticipated vehicular and pedestrian traffic generation.
    When approving land use actions, Oregon City requires all relevant intersections to be maintained at the minimum acceptable level of service (LOS) upon full build-out of the proposed land use action. The minimum acceptable LOS standards are as follows:
    a. For signalized intersection areas of the city that are located outside the Regional Center boundaries a LOS of "D" or better for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of critical movements.
    b. For signalized intersections within the Regional Center boundaries a LOS "D" can be exceeded during the peak hour; however, during the second peak hour, LOS "D" or better will be required as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0.
    c. For unsignalized intersection throughout the city a LOS "E" or better for the poorest approach and with no movement serving more than twenty peak hour vehicles operating at worse than LOS "F" will be tolerated for minor movements during a peak hour.
16. If Tri-Met, upon review of an application for an industrial, institutional, retail or office development, recommends that a bus stop, bus turnout lane, bus shelter, bus landing pad or transit stop connection be constructed at the time of development, the review authority shall require such improvement, using designs supportive of transit use
17. All utility lines shall be placed underground.
18. Access and facilities for physically handicapped people shall be incorporated into the site and building design consistent with applicable federal and state requirements, with particular attention to providing continuous, uninterrupted access routes.
19. For a residential development, site layout shall achieve at least eighty percent of the maximum density of the base zone for the net developable area. Net developable area excludes all areas for required right-of-way dedication, land protected from development through Natural Resource or Geologic Hazards protection, and required open space or park dedication.
20. Screening of Mechanical Equipment:
    a. Rooftop mechanical equipment, including HVAC equipment and utility equipment that serves the structure, shall be screened. Screening shall be accomplished through the use of parapet walls or a sight-obscuring enclosure around the equipment constructed of one of the primary materials used on the primary facades of the structure, and that is an integral part of the building's architectural design. The parapet or screen shall completely surround the rooftop mechanical equipment to an elevation equal to or greater than the highest portion of the rooftop mechanical equipment being screened. In the event such parapet wall does not fully screen all rooftop equipment, then the rooftop equipment shall be enclosed by a screen constructed of one of the primary materials used on the primary facade of the building so as to achieve complete screening.

b. Wall-mounted mechanical equipment shall not be placed on the front facade of a building or on a facade that faces a right-of-way. Wall-mounted mechanical equipment, including air conditioning or HVAC equipment and groups of multiple utility meters, that extends six inches or more from the outer building wall shall be screened from view from streets; from residential, public, and institutional properties; and from public areas of the site or adjacent sites through the use of (a) sight-obscuring enclosures constructed of one of the primary materials used on the primary facade of the structure, (b) sight-obscuring fences, or (c) trees or shrubs that block at least 80 percent of the equipment from view. Wall-mounted mechanical equipment that extends six inches or less from the outer building wall shall be designed to blend in with the color and architectural design of the subject building.

c. Ground-mounted above-grade mechanical equipment shall be screened by ornamental fences, screening enclosures, trees, or shrubs that block at least 80 percent of the view. Such equipment and fixtures shall not be installed within 100 feet of the intersection of two public streets to the maximum extent practicable as determined by the Community Development Director. When this standard is deemed impracticable and placement is permitted within 100 feet of an intersection by the Community Development Director, such equipment and fixtures shall be fully screened with landscaping, fence or wall. Placement and type of screening shall be determined by the Community Development Director.. All mechanical equipment shall comply with the standards in this section. If mechanical equipment is installed outside of the Site Plan and Design Review process, planning staff shall review the plans to determine if additional screening is required. If the proposed screening meets this section, no additional Planning review is required.

21. Building Materials

a. Preferred building materials. Building exteriors shall be constructed from high quality, durable materials. Preferred exterior building materials that reflect the City's desired traditional character are as follows:

a. Brick.
b. Basalt stone or basalt veneer
c. Narrow horizontal wood or composite siding (generally 5 inches wide or less); wider siding will be considered where there is a historic precedent.
d. Board and baton siding
e. Other materials subject to approval by the Community Development Director.
f. Plywood with battens or fiber/composite panels with concealed fasteners and contagious aluminum sections at each joint that are either horizontally or vertically aligned.
g. Stucco shall be trimmed in wood, masonry, or other approved materials and shall be sheltered from extreme weather by roof overhangs or other methods.

b. Prohibited materials. The following materials shall be prohibited in visible locations unless an exception is granted by the Community Development Director based on the integration of the material into the overall design of the structure.

1. Vinyl or plywood siding(including T-111 or similar plywood).
2. Glass block or highly tinted, reflected, translucent or mirrored glass (except stained glass) as more than 10 percent of the building façade
3. Corrugated fiberglass.
4. Chain link fencing (except for temporary purposes such as a construction site or as a
5. gate for a refuse enclosure).
6. Crushed colored rock/crushed tumbled glass.
7. Non-corrugated and highly reflective sheet metal.

c. Special material standards: The following materials are allowed if they comply with the requirements found below:

1. Concrete block. When used for the front façade of any building, concrete blocks shall be split, rock- or ground-faced and shall not be the prominent material of the elevation. Plain concrete block or plain concrete may be used as foundation material if the foundation material is not revealed more than 3 feet above the finished grade level adjacent to the foundation wall.

2. Metal siding. Metal siding shall have visible corner moldings and trim and incorporate masonry or other similar durable/permanent material near the ground level (first two feet above ground level).
3. Exterior Insulation and Finish System (EIFS) and similar troweled finishes shall be trimmed in wood, masonry, or other approved materials and shall be sheltered from extreme weather by roof overhangs or other methods.
4. Building surfaces shall be maintained in a clean condition and painted surfaces shall be maintained to prevent or repair peeling, blistered or cracking paint.

22. Conditions of Approval. The review authority may impose such conditions as it deems necessary to ensure compliance with these standards and other applicable review criteria, including standards set out in city overlay districts, the city's master plans, and city public works design standards. Such conditions shall apply as described in Sections 17.50.310, 17.50.320 and 17.50.330. The review authority may require a property owner to sign a waiver of remonstrance against the formation of and participation in a local improvement district where it deems such a waiver necessary to provide needed improvements reasonably related to the impacts created by the proposed development. To ensure compliance with this chapter, the review authority may require an applicant to sign or accept a legal and enforceable covenant, contract, dedication, easement, performance guarantee, or other document, which shall be approved in form by the city attorney.

17.62.055 Institutional and Commercial Building Standards.

A. Purpose. The primary objective of the regulations contained in this section is to provide a range of design choices that promote creative, functional, and cohesive development that is compatible with surrounding areas. Buildings approved through this process are intended to serve multiple tenants over the life of the building, and are not intended for a one-time occupant. The standards encourage people to spend time in the area, which also provides safety though informal surveillance. Finally, this section is intended to promote the design of an urban environment that is built to human scale by creating buildings and streets that are attractive to pedestrians, create a sense of enclosure, provide activity and interest at the intersection of the public and private spaces , while also accommodating vehicular movement.

B. Applicability. In addition to Section 17.62.050 requirements, institutional and commercial buildings shall comply with design standards contained in this section.

C. Relationship between zoning district design standards and requirements of this section.

1. Building design shall contribute to the uniqueness of the underlying zoning district by applying appropriate materials, elements, features, color range and activity areas tailored specifically to the site and its context.
2. A standardized prototype or franchise design shall be modified if necessary to meet the provisions of this section.
3. In the case of a multiple building development, each individual building shall include predominant characteristics, architectural vocabulary and massing shared by all buildings in the development so that the development forms a cohesive place within the underlying zoning district or community.
4. With the exception of standards for building orientation and building front setbacks, in the event of a conflict between a design standard in this section and a standard or requirement contained in the underlying zoning district, the standard in the zoning district shall prevail.
5. On sites with 100 feet or more of frontage at least 60 percent of the site frontage width shall be occupied by buildings placed within five feet of the property line, unless a greater setback is accepted under the provisions of 17.62.055(D). For sites with less than 100 feet of street frontage, at least 50 percent of the site frontage width shall be occupied by buildings placed within five feet of the property line unless a greater setback is accepted under the provisions of 17.62.055(D),

D. Relationship of Buildings to Streets and Parking.

1. Buildings shall be placed no farther than five feet from the front property line. A larger front yard setback may be approved through site plan and design review if the setback area incorporates at least one element from the following list for every 5 feet of increased setback requested:

a. Tables, benches or other approved seating area
b. Cobbled, patterned or paved stone or enhanced concrete
c. Pedestrian scale lighting
d. Sculpture / public art
e. Fountains / Water feature
f. At least 20 square feet of landscaping or planter boxes for each tenant façade fronting on the activity area
g. outdoor cafe
h. enhanced landscaping additional landscaping.
i. Other elements, as approved by the Community Development Director, that can meet the intent of this section.

2. The front façade shall be oriented toward the street and shall be accessed from a public sidewalk. Primary building entrances shall be clearly defined and recessed or framed by a sheltering element such as an awning, arcade or portico in order to provide shelter from the summer sun and winter weather.
3. Entryways. The primary entranceway for each commercial or retail establishment shall face the major street. The entrance may be recessed behind the property line a maximum of five feet unless a larger setback is approved pursuant to Section17.62.055.D.1 and shall be accessed from a public sidewalk. Primary building entrances shall be clearly defined, highly visible and recessed or framed by a sheltering element including at least four of the following elements, listed below.
   a. Canopies or porticos;
   b. Overhangs;
   c. Recesses/projections;
   d. Arcades;
   e. Raised corniced parapets over the door;
   f. Peaked roof forms;
   g. Arches;
   h. Outdoor patios;
   i. Display windows;
   j. Architectural details such as tile work and moldings which are integrated into the building structure and design;
   k. Integral planters or wing walls that incorporate landscaped areas and/or places for sitting.
   l. Planter boxes and street furniture placed in the right-of-way shall be approved for use according to materials, scale and type.
4. Where additional stores will be located in the large retail establishment, each such store shall have at least one exterior customer entrance, which shall conform to the same requirements. (Ord. 01-1002 §2, 2001)
5. Trellises, canopies and fabric awnings may project up to five feet into front setbacks and public rights-of-way, provided that the base is not less than eight feet at the lowest point and no higher than ten feet above the sidewalk. Awnings shall be no longer than a single storefront.

E. Corner Lots.

For buildings located at the corner of intersections, the primary entrance of the building shall be located at the corner of the building or within 25 feet of the corner of the building. Additionally, one of the following treatments shall be required:

1. Incorporate prominent architectural elements, such as increased building height or massing, cupola, turrets, or pitched roof, at the corner of the building or within 25 feet of the corner of the building.
2. Chamfer the corner of the building (i.e. cut the corner at a 45-degree angle and a minimum of 10 feet from the corner) and incorporate extended weather protection (arcade or awning), special paving materials, street furnishings, or plantings in the chamfered area.

F. Commercial First Floor Frontage.

In order to ensure that the ground floor of structures have adequate height to function efficiently for retail uses, the first floor height to finished ceiling of new infill buildings in the mixed use and neighborhood

commercial districts shall be no lower than 14feet floor to floor Where appropriate, the exterior façade at the ceiling level of new structures shall include banding, a change of materials or relief which responds to the cornice lines and window location of existing buildings that abut new structures.

G. Variation in Massing

1. A single, large, dominant building mass shall be avoided in new buildings and, to the extent reasonably feasible, in development projects involving changes to the mass of existing buildings.
2. Horizontal masses shall not exceed a height: width ratio of 1:3 without substantial variation in massing that includes a change in height and projecting or recessed elements.
3. Changes in mass shall be related to entrances, the integral structure and/or the organization of interior spaces and activities and not merely for cosmetic effect.

H. Minimum Wall Articulation.

1. Facades shall add architectural interest and variety and avoid the effect of a single, long or massive wall with no relation to human size. No wall that faces a street or connecting walkway shall have a blank, uninterrupted length exceeding thirty feet without including, but not be limited to, at least two of the following:

i. Change in plane,

ii. Change in texture or masonry pattern or color,

iii. Windows, treillage with landscaping appropriate for establishment on a trellis.

iv. An equivalent element that subdivides the wall into human scale proportions.

2. Facades greater than one hundred feet in length, measured horizontally, shall incorporate wall plane projections or recesses having a depth of at least three percent of the length of the facade and extending at least twenty percent of the length of the facade. No uninterrupted length of any facade shall exceed one hundred horizontal feet.

3. Ground floor facades that face public streets shall have arcades, display windows, entry areas, awnings or other such features along no less than sixty percent of their horizontal length.

4. Building facades must include a repeating pattern that includes any one or more of the following elements:

a. Color change;

b. Texture change;

c. Material module change.

5. Facades shall have an expression of architectural or structural bays through a change in plane no less than twelve inches in width, such as an offset, reveal or projecting rib.

6. Facades shall have at least one of elements subsections (H) 4 or 5 of this section repeat horizontally. All elements shall repeat at intervals of no more than thirty feet, either horizontally or vertically.

I. Façade Transparency.

1. Transparent windows or doors facing the street are required. The main front elevation shall provide at least sixty percent (60%) windows or transparency at the pedestrian level. Facades on corner lots shall provide at least sixty percent (60%) windows or transparency on all corner-side façades. All other side elevations shall provide at least thirty percent (30%) transparency. The transparency is measured in lineal fashion. For example, a one-hundred-foot long building elevation shall have at least sixty feet (60% of 100 feet) of transparency in length. Reflective, glazed, mirrored or tinted glass is limited to ten percent (10%) of the lineal footage of windows on the street facing façade. Highly reflective or glare-producing glass with a reflective factor of .25 or greater is prohibited on all building facades. Any glazing materials shall have a maximum fifteen (15) percent outside visual light reflectivity value. No exception shall be made for reflective glass styles that appear transparent when internally illuminated.
2. Side or rear walls that face walkways may include false windows and door openings only when actual doors and windows are not feasible because of the nature of the use of the interior use of the building. False windows located within 20 feet of a Right of Way shall be utilized as display windows with a minimum display depth of 36 inches.

J. Roof Treatments.

1. All facades shall have a recognizable "top" consisting of, but not limited to:

a. Cornice treatments, other than just colored "stripes" or "bands," with integrally textured materials such as stone or other masonry or differently colored materials; or
b. Sloping roof with overhangs and brackets; or
c. Stepped parapets;
d. Special architectural features, such as bay windows, decorative roofs and entry features may project up to three feet into street rights-of-way, provided that they are not less than nine feet above the sidewalk.

2. Mixed use buildings: For flat roofs or facades with a horizontal eave, fascia, or parapet, the minimum vertical dimension of roofline modulation is the greater of two feet or 0.1 multiplied by the wall height (finish grade to top of wall). The maximum length of any continuous roofline shall be 75 feet.

3 Other roof forms consistent with the design standards herein may satisfy this standard if the individual segments of the roof with no change in slope or discontinuity are less than 40 feet in width (measured horizontally).

K. Drive-through facilities shall:

1. Be located at the side or rear of the building
2. Be designed to maximize queue storage on site.

17.62.056 Additional Standards for Large Retail Establishments.

A. This section is intended to ensure that large retail building development is compatible with its surrounding area.

B. Large retail establishment shall mean a retail building occupying more than ten thousand gross square feet of floor area.

C. In addition to Sections 17.62.050 and 17.62.055 requirements, large retail buildings shall comply with design standards contained in this section.

D. Development Standards.

1. Roofs. Roofs shall include at least two of the following features:
   a. Parapets concealing flat roofs and rooftop equipment from public view. The average height of such parapets shall not exceed fifteen percent of the height of the supporting wall and such parapets shall not at any point exceed one-third of the height of the supporting wall. Such parapets shall feature three-dimensional cornice treatment;
   b. Overhanging eaves, extending no less than three feet past the supporting walls;
   c. Sloping roofs that do not exceed the average height of the supporting walls, with an average slope greater than or equal to one foot of vertical rise for every three feet of horizontal run and less than or equal to one foot of vertical rise for every one foot of horizontal run;
   d. Three or more roof slope planes.

2. Site Design and Relationship to Surrounding Community. Retail buildings occupying more than twenty-five thousand gross square feet of floor area shall contribute to the establishment or enhancement of community and public spaces by providing at least two of the following:
   a. Patio/seating area;
   b. Pedestrian plaza with benches;
   c. Transportation center;
   d. Window shopping walkway;
   e. Outdoor playground area;
   f. Kiosk area, water feature;
   g. Clock tower;
   h. Or other such deliberately shaped area and/or a focal feature or amenity that, in the judgment of the appropriate decision maker, adequately enhances such community and public spaces.Any such areas shall have direct access to the public sidewalk network and such features shall not be constructed of materials that are inferior to the principal materials of the building and landscape.

17.62.057 Multi Family Standards

A. Purpose. The standards of this section are intended to promote high-quality multi-family residential development and construction; encourage visual variety and architectural compatibility; and promote an integrated character with Oregon City's existing neighborhoods. Specifically, the standards shall:
   1. Promote architectural variety that adds visual interest to the neighborhood.
   2. Reduce the apparent bulk and scale of large buildings.
   3. Provide for a variety of housing types for a range of households and age groups.
   4. Enhance public safety, residential streetscape and the pedestrian environment by diminishing the prominence of garages and parking areas.
   5. Improve the compatibility of multi-family residential development with the residential character of surrounding neighborhoods.
   6. Promote the use of durable materials that which are appropriate for multi-family residential use and which reduce long-term maintenance costs and depreciation.

B. Applicability. In addition to Section 17.62.050 requirements, all multi-family buildings shall comply with the design standards contained in this section. Cottage Housing Development shall follow OCMC 17.62.58 instead of this section.

C. Setbacks-Multi-family developments shall be placed no farther than twenty feet from the front property line. A deeper front yard setback may be approved through site plan and design review if the setback area incorporates enhanced pedestrian spaces and amenities, including but not limited to, street furniture, public art or other such deliberately shaped area and/or a feature or amenity that, in the judgment of the Community Development Director, integrates well with adjoining areas. Setbacks may also be increased in order to protect wildlife habitat and water resources pursuant to section 17.49.100(F), and trees and tree groves pursuant to and 17.41.120(A).

D. Entrances- Every building abutting a street shall have a street facing front façade. The facade shall be oriented to the street and include windows, doorways, and a structured transition from public to private areas using built elements such as porch features, arbors, low walls, trellis work and/or similar elements integrated with planting.

E. Percentage of Frontage - On sites with 100 ft. or more of street frontage at least 50 percent of the site frontage width shall be occupied by buildings placed within 20 feet from the property line, unless a greater setback is accepted under the provisions of section 17.62.057C. For sites with less than 100 ft. of street frontage, at least 40 percent of the site frontage width shall be occupied by buildings placed within 20 feet of the property line, unless a greater setback is accepted under the provisions of section 17.62.056D

F. Pedestrian Circulation
   1. Pathways between dwelling units entrances and the street are required. Such pathways between the street and buildings fronting on the street shall be in a straight line. Exceptions may be allowed by the Director where steep slopes prevent a direct connection or where an indirect route would enhance the design and/or use of a common open space.
   2. The pedestrian circulation system shall connect all main entrances on the site. For townhouses or other residential units fronting on the street, the sidewalk may be used to meet this standard. For multiple-family developments, pedestrian connections to other areas of the site, such as parking areas, recreational areas, common outdoor areas, and any pedestrian amenities shall be required.
   3. Elevated external stairways or walkways, which provide pedestrian access to dwelling units located above the ground floor are *prohibited.* The Community Development Director may allow exceptions for external stairways or walkways located in, or facing interior *courtyard* areas provided they do not compromise visual access from dwelling units into the courtyard.

G. Architectural and Material Standards. Building articulation and modulation - multifamily residential buildings and residential portions of mixed-use buildings. An alternative to the standards in subsection G. below may be approved by the Community Development Director if the design is consistent with the

intent of the standards and a specific architectural or building use exists that prohibits the full implementation of the standard.

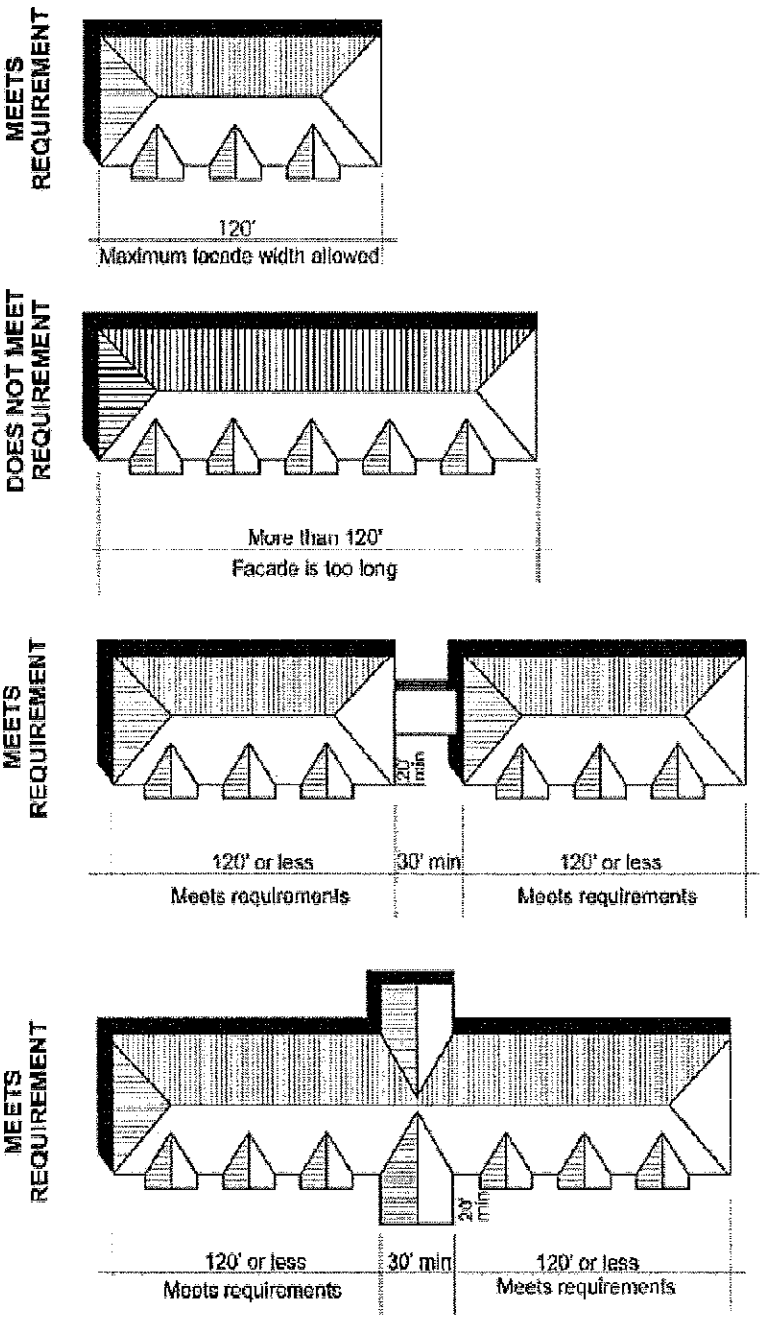
1. Articulation and modulation of buildings is essential in providing the ability for new buildings to be compatible with the surrounding commercial and residential development. All residential buildings and residential portions of mixed-use buildings shall include at least three of the following *modulation* and/or *articulation* features at intervals of no more than 30 feet along all facades facing a street, common open space, and common parking areas:
   a. Repeating distinctive window patterns at intervals less than the required interval. Vertical building *modulation*. Minimum depth and width of *modulation* is 36 inches and 4 feet (respectively) if tied to a change in color or building material and/or roofline *modulation*. Otherwise, minimum depth of *modulation* is 10 feet and minimum width for each *modulation* is 15 feet. Balconies may not be used to meet *modulation* option unless they are recessed or projected from the facade and integrated with the building's architecture as determined by the Community Development Director, Balconies that appear to be "tacked on" to the facade will not qualify for this option.
   b. Horizontal *modulation* (upper level step-backs). The minimum horizontal *modulation* for buildings higher than 2 stories shall be 5 feet. A dormer- set 5 feet back from the front façade-is an example of an acceptable horizontal modulation.
   c. *Articulation* of the building's top, middle, and bottom. This typically includes a distinctive ground floor or lower floor design, consistent *articulation* of middle floors, and a distinctive roofline.





This multifamily building uses a combination of horizontal and vertical modulation, roofline modulation, distinctive window patterns, and clear articulation of the building's top, middle, and bottom to help reduce its perceived architectural scale and add visual interest.

2. Maximum façades width. Buildings visible from the street must use design techniques to break up long continuous building walls, reduce the architectural scale of the building, and add visual interest. Buildings exceeding 120 feet in width along the street front shall be divided by a 30-foot wide *modulation* of the exterior wall, so that the maximum length of a particular facade is 120 feet. Such *modulation* must be at least 20 feet or deeper and extend through all floors. Decks and roof overhangs may encroach up to 3 feet (per side) into the *modulation*. The Director will consider other design methods that are effective at reducing the perceived width of the building. Examples could include a combination of vertical and/or horizontal building modulation with a change in building materials or finishes, a clear change in building articulation and/or fenestration technique.



3. Roofline standards.

a. Single purpose residential buildings in residential districts must provide a pitched roof with minimum 6:12 roof pitch. The maximum width of any continuous roofline shall be 35 feet for single purpose residential buildings. Alternative roof designs will be considered provided design elements are included to help the building and its roofline fit into the site's context.

b. Mixed use buildings and stand-alone residential in commercial districts shall incorporate a roofline *modulation*. Specifically: For flat roofs or facades with a horizontal eave, fascia, or parapet, the minimum vertical dimension of roofline *modulation* is the greater of two feet or 0.1 multiplied by the

wall height (finish grade to top of wall). The maximum length of any continuous roofline shall be 75 feet.

c. Other roof forms consistent with the design standards herein may satisfy this standard if the individual segments of the roof with no change in slope or discontinuity are less than 40 feet in width (measured horizontally).

H. Diversity of building types. Multi-building developments of four or more buildings shall be required to provide different architectural designs to provide interest and variety. This is particularly important where multiple buildings front on the same street. Simple changes in building colors or reversal of basic facade designs are not sufficient to comply with this standard. Consider changes in vertical and/or horizontal *articulation, fenestration*, building materials, architectural style, and/or roof design.

I. Diversity of unit types. Multifamily buildings with more than 25 units are required to provide a diversity of housing types to allow for a range of households and age groups. Unit types are defined as the following: Studio, one-bedroom, two-bedroom and three-bedroom units or an ADA accessible master bedroom and bathroom.

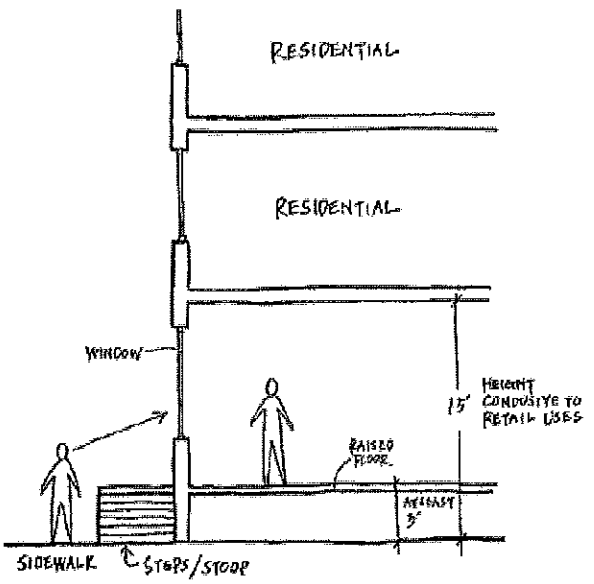
1. Developments of 25-50 units must provide 2 unit types representing a minimum of 10 % of the total units per unit type

2. Developments of 51-75 units must provide 3 unit types representing a minimum of 10 % of the total units per unit type

3. Developments of 76 units and above must provide 4 unit types representing a minimum of 10 % of the total units per unit type

J. Raised ground floor.

This is particularly important when dwelling units are within 15 feet of a sidewalk or common parking area or for buildings in established neighborhoods that have an established pattern with raised dwelling units. Where ground floor residential uses are permitted on the ground floor in commercial districts, developments shall incorporate a 13-foot tall ground floor height to allow future conversion to commercial uses where desirable. Such projects can utilize a false floor 36 inches above the ground for residential uses to increase residents' privacy.



K. Building Materials

All multifamily buildings shall be enhanced with appropriate details. Each of the types of details listed below are worth one point. Multifamily buildings must achieve the equivalent of five points worth of architectural details.

1. Decorative porch design with distinct design and use of materials.
2. Decorative treatment of windows and doors, such as decorative molding/ framing details around all ground floor windows and doors, bay windows, decorative glazing, or door designs., and/or unique window designs.
3. Landscaped trellises or other decorative element that incorporates landscaping near the building entry or entries.
4. Decorative light fixtures with a diffuse visible light source, such as a globe or "acorn" that is non-glaring or a decorative shade or mounting for each building entry on the facade.
5. Brick or stonework covering more than 15 percent of the facade
6. Decorative building materials that add visual interest, including
    a. Individualized patterns or continuous wood details.
    b. Decorative moldings, brackets, wave trim or lattice work.
    c. Other materials with decorative or textural qualities as approved by the Director. The applicant must submit architectural drawings and material samples for approval.
7. Decorative roofline design, including multiple gables and/or dormers , decorative parapet or other design that adds distinct visual interest.
8. Decorative railings, grill work, or terraced landscape beds integrated along the façade of the building.
9. Other details that meet the intent of the guidelines as approved by the Director.

L. Window design.

1. Transparent windows or doors facing the street are required. To meet this requirement, at least 15 percent of the facade must be transparent. Transparency is measured at the 1st floor only.

2. All windows on all elevations shall recess or project individual windows at least two inches from the facade and incorporate window trim at least four inches in width that features color that contrasts with the base building color. Exceptions will be considered by the Community Development Director where buildings employ other distinctive window or facade treatment that adds visual interest to the building.

M. Common Open Space Requirements

1. Intent. Creating areas of common open space that are easily accessed by residents provides focal points for community recreation and interaction and adds to the overall quality of life for residents. Given the environmental and recreational benefits of common open space, it should be integrated purposefully into the overall design of a development and not merely be residual areas left over after buildings and parking lots are sited.

2. Common Open Space Required. All new multi-family developments in all zones except for the Mixed Use Corridor, Neighborhood Commercial or Mixed Use Downtown Districts, shall set aside a percentage of the net site acreage as common open space for the use and enjoyment of the development's residents. The common open space shall be aggregated into meaningful, quality open spaces. Clustering of buildings is encouraged to minimize small, narrow, unassigned strips in front of and between buildings. Open space areas shall be clearly identified on the development plan. Such designated common open space can be in a natural, undisturbed state, or may be landscaped for more formal courtyards or plazas, or may be developed for active or passive recreation. Phasing shall not be used to circumvent common open space standards.

3. Minimum Amount Required. The minimum amount of common open space (as a percentage of net land area) shall be: 15 percent

4. Areas Not Allowed as Part of Common Open Space. The following shall not count toward common open space set-aside requirements:

(a) Private lots, yards, balconies and patios dedicated for use by a specific unit;

(b) Public right-of-way or private streets and drives;

(c) Open parking areas and driveways for dwellings;

(d) Land covered by structures except for ancillary structures associated with the use of the open space such as gazebos and picnic shelters or recreation building.

(e) Designated outdoor storage areas;

(f) Land areas between buildings and parking lots or driveways of less than 20 feet;

(g) Required perimeter setbacks; and
(h)Detention/retention facilities, including drainage swales, except that detention or retention areas and stormwater management structures or facilities may be used to meet up to one-hundred percent (100%) of the required common open space amount provided such areas or facilities are accessible and useable, as determined by the city, as year-round community amenities by the residents of the development (e.g., picnic areas, passive recreation areas, playgrounds, ponds for fishing and/or boating, etc.)

f. Required Greenway Linkages. Where a greenway linkage, natural or water resource area or other public park is dedicated to or acquired by the City, the area may be credited toward ½ the minimum amount of common open space required. The dedicated lands are not to be calculated in the net land area.

g. Design Criteria for Open Space. All common open space lands shall meet the following design criteria, as relevant:

2. Connectivity Required. To the maximum extent practicable, common open space shall be organized to create integrated systems of open space that connect with the following types of lands located within or adjacent to the development:
(1) Dedicated public park, greenway, or habitat lands;
(2) Dedicated school sites;
(3) Other dedicated open spaces;
(4) Common open space located adjacent to the development;
(5) Portions of the regional trail and open space system;

a. Compact and Contiguous. To the maximum extent practicable, common open space land shall be compact and contiguous unless the land is used as a continuation of an existing greenway, trail, or other linear park, or unless specific topographic features require a different configuration. An example of such topographic features would be the provision of open space along a scenic creek.

b. Accessible to Residents. Common open space shall be reasonably accessible to all of the residents of the development. The city may require access to be restricted if it would degrade, destroy, or adversely interfere with sensitive environmental or natural areas or with significant historic or cultural resources

c. Recreational Facilities. If an applicant constructs recreational facilities in the common open space as a community amenity, such recreational facilities shall be constructed in accordance with applicable city standards regarding, but not limited to, size, siting, use, materials, and similar matters. The recreational facilities shall be built with long-lasting and sturdy materials. A long-term maintenance schedule may be required to ensure that there is sufficient funding and management set in place for the amenity to be maintained and replaced if needed.

d. Design Criteria. Common open spaces, other than those preserved as natural features or areas, should include gardens, courtyards, recreation, or play areas. Required common open space areas over 10,000 square feet of non-natural area shall provide a minimum of five amenities from the list below. Open space of 10,000 feet or less of non-natural area shall provide three amenities.
(i) Seasonal planting/community gardening areas.
(ii) Large trees
(iii) Seating.
(iv) Pedestrian-scaled lighting.
(v) Gazebos or other decorative shelters.
(vi) Play structures for children.
(vii) On-site community recreation amenities.
(viii) Roof gardens or shared patio decks
(ix) An alternative amenity as approved by the Community Development Director.

4. Exceptions to the common open space standard may be granted for the following:

a. For multi-unit developments of up to 25 units (or for the first 25 units of a larger project) no common open space shall be required when such developments are within one-quarter mile (measured walking distance) to a public park of 3 acres or more; and there is a direct, improved, permanent, public, Americans with Disabilities Act (ADA) - accessible, lighted, maintained pedestrian trail or sidewalk between the sites. An exception shall be granted only when the nearby park provides an active and fully improved recreation area.

b. For multi-unit developments with required common open space in excess of 15,000 square feet, the required open space may be reduced by ½ if access to the public is provided. The qualifying open space area shall be for active use, be maintained by the home owners association and not be within the boundaries of a Water Resource Buffer area.

N. Private Open Space

1. Private Open Space Required. All new multi-family developments in all zones except for the Mixed Use Corridor, Neighborhood Commercial or Mixed Use Downtown Districts, shall set aside a private open space for the use and enjoyment of the development's residents. Private open space is a semi-enclosed area, which is intended for use strictly by the occupants of one dwelling unit. Private open space may include porches, balconies, terraces, roof top gardens, verandas, and decks. Dwellings located at finished grade, or within five feet of finished grade, shall provide a minimum of ninety-six square feet of private open space per dwelling unit, with no dimension less than six feet. Dwellings located more than five feet above finished grade shall provide a minimum of forty-eight square feet with no dimension less then six feet. Ground level private open space shall be visually and physically separated from common open space through the use of perimeter landscaping or fencing.

2. Common And Private Open Space Requirements For Multifamily Dwelling Units In The Mixed Use Corridor, Neighborhood Commercial Or Mixed Use Downtown Districts.All residential development in the Mixed Use Corridor, Neighborhood Commercial Or Mixed Use Downtown Districts must provide a portion of the project area for private open space or common open space. Fifty (50) square feet of private or common open space is required for each dwelling unit. The open space may be allocated exclusively for private or common use or may be a combination of the two uses.

a.*Common Open Space*: Common open space may be provided in the form of decks, shared patios, roof gardens, recreation rooms, lobbies or other gathering spaces created strictly for the tenants and not associated with storage or circulation. Landscape buffer areas may not be used as common open space unless active and passive uses are integrated into the space and its use will not adversely affect abutting properties.

b.Private Open Space: Private open space may be provided in the forms of decks, screened patios, roof gardens or an alternate private space as approved by the Community Development Director.

17.62.059 Cottage Housing

A. Applicability

These guidelines apply to all cottage developments in any applicable zone within the City. Cottages are considered multi family development and are subject to all the applicable sections of OCMC 17.62. Site Plan and Design Review and OCMC 17.52 Off Street Parking and Loading. However, this section replaces OCMC 17.62.057- multifamily. The proposed development shall be processed under the Type II Land Use process and shall remain one lot. Where there is a conflict between these standards and the standards in other chapters, the Cottage Housing standards shall apply.

B. Intent

1. To provide a housing type that responds to changing household sizes and ages (e.g., retirees, small families, single person households).
2. To encourage creation of more usable open space for residents of the development through flexibility in density and lot standards.
3. To ensure that the overall size, including bulk and mass of cottage structures and cottage housing developments, remain smaller and incur less visual impact than standard sized single-family dwellings, particularly given the allowed intensity of cottage dwellings.
4. To provide centrally located and functional common open space that fosters a sense of community and a sense of openness in cottage housing developments.
5. To provide private area around the individual dwellings to enable diversity in landscape design and foster a sense of ownership.

6. To ensure minimal visual impact from vehicular use and storage areas for residents of the cottage housing development as well as adjacent properties, and to maintain a single-family character along public streets.



Cottage Clusters

Cottage housing provides an option that preserves the privacy and personal space of a detached house in a smaller and less costly unit. Cottages provide a way to trade **quantity** of space **for quality** of space.

C. Density bonus. For Developments in, R6, R8 and R-10 Zoning Districts: The City shall allow up to two cottage units for each regular dwelling unit allowed under existing standards in applicable zoning districts. For Developments in the R 3.5 and R-5 zoning district: The City shall allow up to 1.5 cottage units for each regular dwelling unit allowed under existing standards in the applicable zoning district.
D. Dimensional standards for cottage housing.

Dimensional Standards for Cottage Housing
Standard Requirement

1. Average Gross Floor Area 800 square feet per dwelling
2. Maximum Gross Floor Area 1,200 square feet per dwelling
3. Minimum Gross Floor Area 600 square feet per dwelling
4. Maximum Footprint (not including porches) 700 square feet per dwelling
5. Minimum Common Space 400 square feet per dwelling
6. Minimum Private Open Space 200 square feet per dwelling
7. Maximum Height 25 feet.
8. Setbacks (to exterior property lines) Same as the underlying zone
9. Setbacks for non-habitable accessory buildings 200 square feet or under to follow OCMC 17.54.010 (b) 2
10. Minimum Distance Separating Structures (*excluding accessory structures)* 10 feet
11. Minimum roof slope of all structures 6:12
12. Minimum Parking Spaces 1.5 space per dwelling
13. Clustering Groups Developments shall contain a minimum of 4 and a maximum of 12 dwellings located in a cluster group to encourage a sense of community among the residents. A development site may contain more than one group.
14. Minimum Lot size 10,000 square feet.
15. The total square footage of a cottage dwelling unit may not be increased. A note shall be placed on the title to the property for purpose of notifying future property owners that any increase in the total square footage of a cottage is prohibited for the life of the cottage or the duration of the city cottage housing regulations.







E. Cottage open space design standards:
1) Common open space requirements for cottage developments:
   a) Shall abut at least 50 percent of the cottages in a cottage housing development.
   b) Shall have cottages abutting on at least two sides of the common open space.
   c) Cottages shall be oriented around and have an entry facing the common open space.
   d) Cottages shall be within 60 feet walking distance of the common open space.
   e) Shall be at least 20 feet in width.
   f) Shall be designed and maintained as an amenity for residents of the development.
2) Required private open space for cottage dwelling units shall be adjacent to each dwelling unit and for the exclusive use of the cottage resident(s). The private space shall be a minimum of 200 square feet:
   a) Usable (not on a steep slope).
   b) Oriented toward the common open space as much as possible.
   c) No dimension less than ten feet.

3)Alternative open space configurations may be permitted by the Community Development Director provided they present a hierarchy of usable semi-private and public open spaces that meet the intent of the guidelines.

F. Porches and covered entry standards for cottages:

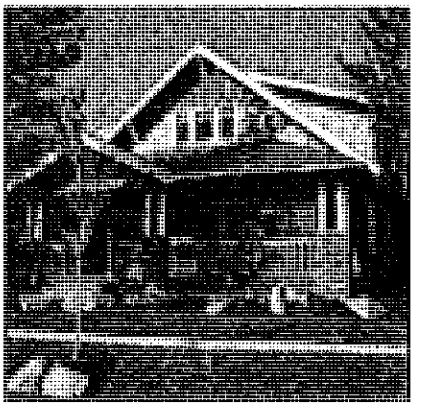
1) Cottage facades facing the common open space, common pathway, or street shall feature a roofed porch at least sixty square feet in size with a minimum dimension of six feet. The front porch shall be covered and must be a minimum of of 24 inches above average grade and contain railings.

2) *Exemption:* House styles that do not contain porches or require a reduction in the size of the porch or its location may request an exemption from the Community Development Director from (a) above, if another type of pronounced entryway is provided. Pronounced entrances may include a rounded front door, canopy or other articulated entrances, columns, and/or other similar features provided they are compatible with the architectural style of the house. A reduced porch may be allowed if there is sufficient architectural or topographical reason to reduce the size of the porch.

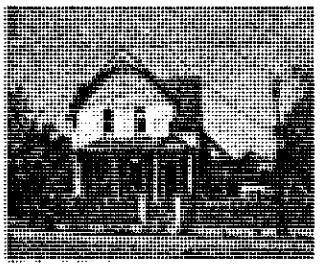
G. Architectural styles. Structures shall be consistent with historic architectural styles
Approved architectural style included: Western Farmhouse/Vernacular, Bungalow and Queen Anne Vernacular. Examples and architectural descriptions of Oregon City historic single-family residential styles can be found in the 2006 Historic Review Board's Design Guidelines for New Construction. An alternate architectural style may be approved by the Community Development Director if it meets the intent of the chapter.



Western Farmhouse/Vernacular



Bungalow (Craftsman)



Queen Anne Vernacular

H.Architectural details. Dwelling units shall contain architectural details.

1. Each of the types of details listed below are worth one point unless otherwise noted. Dwelling units must achieve the equivalent of five points worth of architectural details.

a) Stonework detailing on columns or across foundation.

b) Brick or stonework covering more than 10 percent of the facade

c) Wood, cladded wood, or fiberglass windows on all four elevations of the building. *(2- points).*

e) Decorative roofline elements including roof brackets or multiple dormers.

f) Decorative porch elements including scrolls, or brackets, or railings

g) Decorative shingle designs.

h) Decorative paint schemes (three or more colors)i.Other architectural detailing may be approve by the by the Community Development Director if they are constructed with quality material, have a high level of craftsmanship and are consistent with the architectural style of the dwelling.

2.Approved siding materials.

a. Brick.
b. Basalt stone or basalt veneer
c. Narrow horizontal wood or composite siding (5 inches wide or less); wider siding will be considered where there is a historic precedent.
d. Board and baton siding solely as an accent element unless the design has historic precedent and is approved by the Community Development Director through the exemption process.

3.Other materials may be approve by the Community Development Director if they are consistent with the quality of the approved siding materials and have historic precedence in Oregon City.

I. Windows

All windows on all elevations must be recessed at least two inches from the facade and incorporate window trim at least four inches in width. Windows on corner lots must provide an average of one window every 15 feet of linear elevation on each floor of the side elevation.

J Cottage parking shall be:
1) Located on the same property as the cottage development.
2) Screened from public streets and adjacent residential uses by landscaping or architectural screening.
3) Located in clusters of not more than five adjoining spaces (except where parking areas are adjacent to an alley).
4) Prohibited in front and interior yard setback areas.
5) A pitched roof design is required for all detached parking structures. Detached parking structures/garages shall be 500 square feet or less and are not counted a part of the gross floor area of the cottage.
6) Garages may be attached to individual cottages provided all other design standards have been met and the footprint of the ground floor, including the garage, is included as part of the gross floor area calculations. Such garages shall be located away from common open, shall have garage doors of 10 feet or less in width and be architecturally subordinate to the cottage. No Accessory Dwelling Units (ADU) are allowed within a cottage housing development.
K. Fences.
All fences on the interior of the development shall be no more than thirty-six inches in height. Fences along the exterior property lines are subject to the fence requirements of OCMC 17.54.100 Chain link fences shall not be allowed.





17.62.065 Outdoor Lighting

A. Purpose. The general purpose of this Section is to require outdoor lighting that is adequate for safety and convenience; in scale with the activity to be illuminated and its surroundings; directed to the surface or activity to be illuminated; and designed to clearly render people and objects and contribute to a pleasant nighttime environment. Additional specific purposes are to:

1. Provide safety and personal security as well as convenience and utility in areas of public use or traverse, for uses where there is outdoor public activity during hours of darkness;
2. Control glare and excessive brightness to improve visual performance, allow better visibility with relatively less light, and protect residents from nuisance and discomfort;
3. Control trespass light onto neighboring properties to protect inhabitants from the consequences of stray light shining in inhabitants' eyes or onto neighboring properties;
4. Result in cost and energy savings to establishments by carefully directing light at the surface area or activity to be illuminated, using only the amount of light necessary; and
5. Control light pollution to minimize the negative effects of misdirected light and recapture views to the night sky.

B. Applicability

1. General

a. All exterior lighting for any type of commercial, mixed-use, industrial or multi-family development shall comply with the standards of this Section, unless excepted in Subsection B.3.

b. The City Engineer/Public Works Director shall have the authority to enforce these regulations on private property if any outdoor illumination is determined to present an immediate threat to the public health, safety and welfare.

2. Lighting Plan Requirement
All commercial, industrial, mixed-use, cottage housing and multi-family developments shall submit a proposed exterior lighting plan. The plan must be submitted concurrently with the site plan. The exterior lighting plan shall include plans and specifications for streetlights, parking lot lights, and exterior building lights. The specifications shall include details of the pole, fixture height and design, lamp type, wattage, and spacing of lights.
3. Excepted Lighting
The following types of lighting are excepted from the requirements of this Section.

a. Residential lighting for single-family attached and detached homes, and duplexes.
b. Public street and right-of-way lighting.
c. Temporary decorative seasonal lighting provided that individual lamps have a light output of 60 watts or less.
d. Temporary lighting for emergency or nighttime work and construction.
e. Temporary lighting for theatrical, television, and performance areas, or for special public events.
f. Lighting for a special district, street, or building that, according to an adopted municipal plan or ordinance, is determined to require special lighting aesthetics as part of its physical character.
g. Lighting required and regulated by the Federal Aviation Administration.

C. General Review Standard. If installed, all exterior lighting shall meet the functional security needs of the proposed land use without adversely affecting adjacent properties or the community. For purposes of this Section, properties that comply with the design standards of Subsection D below shall be deemed to not adversely affect adjacent properties or the community.
D. Design and Illumination Standards
General Outdoor Lighting Standard and Glare Prohibition

1. Outdoor lighting, if provided, shall be provided in a manner that enhances security, is appropriate for the use, avoids adverse impacts on surrounding properties, and the night sky through appropriate shielding as defined in this section. Glare shall not cause illumination on other properties in excess of a measurement of 0.5 foot-candles of light as measured at the property line. In no case shall exterior lighting add more than 0.5 footcandle to illumination levels at any point off-site.Exterior lighting is not required except for purposes of public safety. However, if installed, all exterior lighting shall meet the following design standards:
2. Any light source or lamp that emits more than 900 lumens (13 watt compact fluorescent or 60 watt incandescent) shall be concealed or shielded with a full cut-off style fixture in order to minimize the potential for glare and unnecessary diffusion on adjacent property. All fixtures shall utilize one of the following bulb types: metal halide, induction lamp, compact fluorescent, incandescent (including tungsten-halogen), or high pressure sodium with a color rendering index above 70.
3. The maximum height of any lighting pole serving a multi-family residential use shall be 20 feet. The maximum height serving any other type of use shall be 25 feet, except in parking lots larger than five acres, the maximum height shall be 35 feet if the pole is located at least 100 feet from any residential use.
4. Lighting levels

Table 1-17.62.065. Foot-candle Levels

Location	Min	Max	Avg
Pedestrian Walkways	0.5	7:1 max/min ratio	1.5
Pedestrian Walkways in Parking Lots		10:1 max/min ratio	0.5
Pedestrian Accessways	0.5	7:1 max/min ratio	1.5
Building Entrances	3		
Bicycle Parking Areas	3		

Residential			

5. Parking lots and other background spaces shall be illuminated as unobtrusively as possible while meeting the functional needs of safe circulation and protection of people and property. Foreground spaces, such as building entrances and outside seating areas, shall utilize pedestrian scale lighting that defines the space without glare.
6. Any on-site pedestrian circulation system shall be lighted to enhance pedestrian safety and allow employees, residents, customers or the public to use the walkways at night. Pedestrian walkway lighting through parking lots shall be lighted to light the walkway and enhance pedestrian safety pursuant to Table 1.
7. Pedestrian Accessways. To enhance pedestrian and bicycle safety, pedestrian accessways required pursuant to OCMC 12.28 shall be lighted with pedestrian-scale lighting. Accessway lighting shall be to a minimum level of one-half foot-candles, a one and one-half foot-candle average, and a maximum to minimum ratio of seven-to-one and shall be oriented not to shine upon adjacent properties. Street lighting shall be provided at both entrances. Lamps shall include a high-pressure sodium bulb with an unbreakable lens.
8. Floodlights shall not be utilized to light all or any portion of a building facade between 10:00 pm and 6:00 am.
9. Lighting on automobile service station, convenience store, and other outdoor canopies shall be fully recessed into the canopy and shall not protrude downward beyond the ceiling of the canopy.
10. The style of light standards and fixtures shall be consistent with the style and character of architecture proposed on the site.
11. In no case shall exterior lighting add more than 1 foot-candle to illumination levels at any point off-site.
12. All outdoor light not necessary for security purposes shall be reduced, activated by motion sensor detectors, or turned off during non-operating hours.
13. Light fixtures used to illuminate flags, statues, or any other objects mounted on a pole, pedestal, or platform shall use a narrow cone beam of light that will not extend beyond the illuminated object.
14. For upward-directed architectural, landscape, and decorative lighting, direct light emissions shall not be visible above the building roofline.
15. No flickering or flashing lights shall be permitted, except for temporary decorative seasonal lighting.
16. Wireless Sites. Unless required by the Federal Aviation Administration or the Oregon Aeronautics Division, artificial lighting of wireless communication towers and antennas shall be prohibited. Strobe lighting of Wireless Communication facilities is prohibited unless required by the Federal Aviation Administration. Security lighting for equipment shelters or cabinets and other on-the-ground auxiliary equipment on Wireless Communication Facilities shall be initiated by motion detecting lighting.
17. Lighting for outdoor recreational uses such as ball fields, playing fields, tennis courts, and similar uses, provided that such uses comply with the following standards:
    i. Maximum permitted light post height: 80 feet.
    ii. Maximum permitted illumination at the property line: 0.5 foot-candles.

17.62.080 Special Development Standards along Transit Streets.

A. Purpose. This section is intended to provide direct and convenient pedestrian access to retail, office and institutional buildings from public sidewalks and transit facilities and to promote pedestrian and transit travel to commercial and institutional facilities.

B. Applicability. Except as otherwise provide in this section, the requirements of this section shall apply to the construction of new retail, office and institutional buildings which front on a transit street.

C. Development Standards.

1. All buildings shall have at least one main building entrance oriented towards the transit street. A main building entrance is oriented toward a transit street if it is directly located on the transit street, or if it

is linked to the transit street by an on-site pedestrian walkway that does not cross off-street parking or maneuvering areas.

a. If the site has frontage on more than one transit street, or on a transit street and a street intersecting a transit street, the building shall provide one main building entrance oriented to the transit street or to the corner where the two streets intersect.

b. For building facades over three hundred feet in length on a transit street, two or more main building entrances shall be provided as appropriate and oriented towards the transit street

2. Main building entrances shall be well lighted and visible from the transit street. The minimum lighting level for building entries shall be three foot-candles. Lighting shall be a pedestrian scale with the source light shielded to reduce glare.

3. In the event a requirement of this section conflicts with other requirements in Title 17, the requirements of this section shall control.

D. Exemptions. The following permitted uses are exempted from meeting the requirements of subsection C of this section:

1. Heavy equipment sales;

2. Motor vehicle service stations, including convenience stores associated therewith;

3. Solid waste transfer stations;.and

4.Truck stops, including convenience stores, eating or drinking establishments, overnight accommodations or other similar services associated therewith. A use found by the Community Development Director to be similar to the exempt uses above.

17.62.085: Refuse And Recycling Standards For Commercial, Industrial, and Multi-family Developments

The purpose and intent of these provisions is to provide an efficient, safe and convenient refuse and recycling enclosure for the public as well as the local collection firm. All new development, change in property use, expansions or exterior alterations to uses other than single-family or duplex residences shall include a refuse and recycling enclosure. The area(s) shall be:

A. Sized appropriately to meet the needs of current and expected tenants, including an expansion area if necessary;

B. Designed with sturdy materials, which are compatible to the primary structure(s);

C. Fully enclosed and visually screened;

D. Located in a manner easily and safely accessible by collection vehicles;

E. Located in a manner so as not to hinder travel lanes, walkways, streets or adjacent properties;

F. On a level, hard surface designed to discharge surface water runoff and avoid ponding;

G. Maintained by the property owner;

H. Used only for purposes of storing solid waste and recyclable materials;

I. Designed in accordance with applicable sections of the Oregon City Municipal Code (including Chapter 8.20-Solid Waste Collection and Disposal) and City adopted policies.

17.62.090 Enforcement.

A. Applications for site plan and design review shall be reviewed in the manner provided in Chapter 17.50. The city building official may issue a certificate of occupancy only after the improvements required by site plan and design review approval have been completed, or a schedule for completion and a bond or other financial guarantee have been accepted by the city.

B. In performing site plan and design review, the review authority shall consider the effect of additional financial burdens imposed by such review on the cost and availability of needed housing types. Consideration of such factors shall not prevent the imposition of conditions of approval found necessary to meet the requirements of this section. The cost of such conditions of approval shall not unduly increase the cost of housing beyond the minimum necessary to achieve the provisions of this title, nor

shall such cost prevent the construction of needed housing types. The use of the site plan and design review provisions of this section shall have no effect on dwelling unit densities.

17.62.095 Performance Guarantees.

A. Purpose. This section states the requirements for performance guarantees when they are required of an applicant by this Section or as a condition of a site plan and design review approval.
B. Types of guarantees. Guarantees by the applicant may be in the form of a performance bond payable to the City in cash, by certified check, time certificate of deposit, irrevocable letter of credit, or other form acceptable to the City. Indemnity agreements may be used by other governmental agencies. Guarantees must be accompanied by a contract. The form of the guarantee and contract must be approved by the City Attorney. The Community Development Director is authorized to accept and sign the contract for the City, and to accept the guarantee. The guarantee must be filed with the City Recorder.
C. Amount of guarantee. The amount of the performance guarantee must be equal to at least 110 percent of the estimated cost of performance. The applicant must provide written estimates by three contractors with their names and addresses. The estimates must include as separate items all materials, labor, and other costs of the required action.
D. Completion. An inspection and approval of the action or improvement covered by the performance guarantee is required before the performance guarantee is returned. The inspection is done by the Planning Division or by other appropriate City departments. If the action or improvement is not completed satisfactorily within the stated time limits, the City may have the necessary action or improvement completed and seek reimbursement for the work from the performance guarantee. Any remaining funds will be returned to the applicant.

17.62.100 Fees.

Pursuant to Section 17.50.480, a nonrefundable application fee shall accompany the application for site plan and review.

Oregon City Municipal Code
Chapter 17.65 - Master Plans

17.65.030 Applicability of the Master Plan Regulations.

A. Submission. A master plan shall be submitted for any institutional development on a site over ten acres in size. If the boundaries of an institutional development exceed ten acres in size, the proposed development shall be master planned using the regulations of this chapter. No permit under this title shall by issued for any institutional development in excess of ten acres in total acreage unless it is accompanied by or preceded by a master plan approval under this chapter.

The provisions of this chapter do not apply to modifications to existing institutional developments unless the modification results in a cumulative square footage increase of over ten thousand total building square feet in an existing institutional development over ten acres.

B. When Required as Part of Previous Land Use Review. The master plan regulations may be used to fulfill a condition of approval from a previous land use decision-requiring master planning for a development.

C. When Identified in the Oregon City Comprehensive Plan. The master plan regulations are required for all properties identified for master planning in the Land Use section of the Oregon City Comprehensive Plan.

D. Voluntarily. An applicant may voluntarily submit a master plan as part of a land use review.

17.65.040 Procedure.

A. Preapplication Review. Prior to filing for either concept development plan or detailed development plan approval, the applicant shall file a pre-application conference pursuant to Section 17.50.030.

B. General Development Plan. An application for a general development plan describing the the long-term buildout of tlie site shall be reviewed through a Type III procedure. An applicant must have an approved general development plan before any detailed development plan may be approved, unless both are approved or amended concurrently. Amendments to an approved general development plan shall be reviewed under a Type III procedure pursuant to Section 17.65.080.

C. Detailed Development Plan. An application for a detailed development plan, is processed through a Type II procedure, as long as it is in conformance with tlie approved generaldevelopment plan. Amendments to an approved detailed development plan shall be processed pursuant to Section 17.65.080. Once a development has an approved detailed development plan, Chapter 17.62 Site Plan and Design Review is not be required.

D. Concurrent Review. An applicant may concurrently apply for a general development plan and a detailed development plan, or any phase of a detailed development plan. Such a concurrent application is reviewed through a Type III procedure. (Ord. 03-1014, Att. B3 (part), 2003)

17.65.050 Concept Development Plan.

A. Approval Criteria for a General Development Plan. The Planning Commission shall approve an application for generaldevelopment plan approval only upon finding that the following approval criteria are met.

1. The proposed general development plan is consistent with the purposes of Section 17.65.

2. The transportation system has sufficient capacity based on the City's level of service standards and is capable of safely supporting the development proposed in addition to the existing and planned uses in the area, or will be made adequate by the time each phase of the development is completed.
3. Public services for water supply, police, fire, sanitary waste disposal, and storm-water disposal are capable of serving the proposed development, or will be made capable by the time each phase of the development is completed.
4. The proposed general development plan protects any inventoried Goal 5 natural, historic or cultural resources within the proposed development boundary consistent with the provisions of applicable overlay districts.
5. The proposed general development plan, including development standards and impact mitigation thresholds and improvements adequately mitigates identified impacts from each phase of development. For needed housing, as defined in ORS 197.303(1), the development standards and mitigation thresholds shall contain clear and objective standards.
6. The proposed general Development Plan is consistent with the Oregon City Comprehensive Plan and its ancillary documents.

B. Duration of General Development Plan. A general development plan shall involve a planning period of at least five years and up to twenty years. An approved general development plan shall remain in effect until development allowed by the plan has been completed through the detailed development plan process, the plan is amended or superceded, or the plan expires under its stated expiration date. (Ord. 03-1014, Att. B3 (part), 2003)

17.65.070 Adjustments to Development Standards.

A. Purpose. In order to implement the purpose of the City's master plan process, which is to foster the growth of major institutions and other large-scale development, while identifying and mitigating their impacts on surrounding properties and public infrastructure, an applicant may request one or more adjustments to the applicable development regulations as part of the master planning process. These include, but are not limited to, items such as: dimensional standards of the of the underlying zone, Site Plan and Design Review criteria, residential design standards, and standards for land division approval.

B. Procedure. Requests for adjustments shall be processed concurrently with a general development plan. An adjustment request at the detailed development plan review shall cause the detailed development plan to be reviewed as a Type III application.

C. Regulations That May Not be Adjusted. Adjustments are prohibited for the following items:
1. To allow a primary or accessory use that is not allowed by the regulations;
2. To any regulation that contains the word "prohibited";
3. As an exception to a threshold review, such as a Type III review process; and
4. Any exception to allow a use not identified as a permitted or conditional use in the underlying zone.

D. Approval Criteria. A request for an adjustment to one or more applicable development regulations under this section shall be approved if the review body finds that the applicant has shown the following criteria to be met.
1. Granting the adjustment will equally or better meet the purpose of the regulation to be modified;
2. If more than one adjustment is being requested, the cumulative effect of the adjustments results in a project that is still consistent with the overall purpose of the zone;
3. City-designated Goal 5 resources are protected to the extent otherwise required by Title 17;
4. Any impacts resulting from the adjustment are mitigated; and
5. If in an environmental zone, the proposal has as few significant detrimental environmental

impacts on the resource and resource values as is practicable. (Ord. 03-1014, Att. B3 (part), 2003)

6. The proposed adjustment is consistent with the Oregon City Comprehensive Plan and ancillary documents.

Oregon City Municipal Code
Chapter 17.68 Zoning Changes and Amendments

17.68.010 Initiation of the Amendment.

A text amendment to this title or the Comprehensive Plan, or an amendment to the zoning map or the Comprehensive Plan map, may be initiated by:

A. A resolution request by the City Commission;
B. An official proposal by the Planning Commission;
C. An application to the Planning Division presented on forms and accompanied by information prescribed by the planning commission.
D. A Legislative request by the Planning Division

All requests for amendment or change in this title shall be referred to the Planning Commission.

17.68.020 Criteria.

The criteria for a zone change are set forth as follows:

A. The proposal shall be consistent with the goals and policies of the Comprehensive Plan.
B. That public facilities and services (water, sewer, storm drainage, transportation, schools, police and fire protection) are presently capable of supporting the uses allowed by the zone, or can be made available prior to issuing a certificate of occupancy. Service shall be sufficient to support the range of uses and development allowed by the zone.
C. The land uses authorized by the proposal are consistent with the existing or planned function, capacity and level of service of the transportation system serving the proposed zoning district.
D. Statewide planning goals shall be addressed if the comprehensive plan does not contain specific policies or provisions which control the amendment.

17.68.025 Zoning Changes for Land Annexed into the City.

A. Notwithstanding any other section of this chapter, when property is annexed into the City from the city/county dual interest area with any of the following comprehensive plan designations, the property shall be rezoned upon annexation to the corresponding City zoning designation as follows:

Plan Designation	**Zone**
Low-Density Residential	R-10
Medium-Density Residential	R-5
High-Density Residential	R-2
General Commercial	C
Industrial	CI-Campus Industrial
Mixed Use Downtown	MUD
Mixed Use Employment	MUE
Mixed Use Commercial	- NC
Future Urban	FU-10

B. Applications for these rezonings shall be reviewed pursuant to the requirements in Section 17.50.

17.68.030 Public Hearing.

A public hearing shall be held pursuant to standards set forth in Chapter 17.50.
A. Quasi-judicial reviews shall be subject to the requirements in Sections 17.50.
B. Legislative reviews shall be subject to the requirements in Section 17.50.

17.68.040 Approval by the Commission.

If the Planning Commission approves such request or application for an amendment, or change, it shall forward its findings and recommendation to the City Commission for action thereon by that body.

17.68.050 Conditions.

In granting a change in zoning classification to any property, the Commission may attach such conditions and requirements to the zone change as the Commission deems necessary in the public interest, in the nature of, but not limited to those listed in Section 17.56.010:
A. Such conditions and restrictions shall thereafter apply to the zone change;
B. Where such conditions are attached, no zone change shall become effective until the written acceptance of the terms of the zone change ordinance as per Section 17.50.

17.68.060 Filing of an Application.

Applications for amendment, or change in this title shall be filed with the Planning Division on forms available at the Planning Division office. At the time of filing an application, the applicant shall pay the sum listed in the Community Development Department Fee Schedule.

Oregon City Municipal Code
Chapter 17.80 Communication Facilities

17.80.10 Purpose.

The provisions of this chapter are designed to protect the visual, aesthetic, and historical features of Oregon City, ensure that wireless communications services are located, designed, installed, maintained, and removed in an appropriate manner for the safety, health, and welfare of the citizens of Oregon City, and to provide for development consistent with the Oregon City Comprehensive Plan by:

A. Promoting maximum utilization and encourage collocation of new and existing wireless communication antennas to minimize the total number of support structures and towers throughout the City;
B. Encouraging careful consideration of topography, greenways, and historical significance of potential telecommunication sites and the use of camouflaging and screening to ensure development has minimal impacts on the community, views, and historical areas;
C. Encouraging the use of existing buildings, light or utility poles, or water towers as opposed to construction of new telecommunication towers; and
D. Encourage the location of monopole telecommunication towers and antenna arrays in non-residential areas.

17.80.30 Applicability and Exemptions.

A. Applicability. All wireless communication facilities that are not exempt pursuant to this section shall conform to the standards specified in this chapter.
B. Exemptions. The following are exempt from the provisions of this chapter and shall be allowed:
   1. Wireless communication facilities that were legally established prior to the effective date of this chapter;
   2. Temporary facilities used on the same property for sixty (60) days or less;
   3. Temporary wireless communications facilities of all types that are used by a public agency solely for emergency communications in the event of a disaster, emergency preparedness, or public health or safety purposes;
   4. Any maintenance or repair of previously approved wireless communications facilities provided that such activity does not increase the height, width, or mass of the facility;
   5. Dish antennas used for residential purposes;
   6. VHF and UHF receive-only television antennas and radio transmitter antennas on public facilities used for public safety, provided they are fifteen (15) feet or less above the existing or proposed roof;
   7. Amateur Stations on properties zoned residential are exempt from the standards of this Chapter. Amateur Stations on properties zoned non-residential are exempt from the standards of this Chapter, provided the antenna is fifteen (15) feet or less above the existing or proposed roof. Amateur Stations located on: (1) public facilities/property; or (2) properties zoned non-residential with an antenna in excess of fifteen (15) feet above the existing or proposed roof, shall be reviewed under the Compatibility Review process set forth in this Chapter and shall be subject to the Design Standards of Section 17.80.110; and
   8. Wireless Communication Facilities for public safety are exempt from the following Sections: Section 17.80.090.C.17, Section 17.80.090.D.2, Section 17.80.090.D.5, and Section 17.80.100.

17.80.40 Collocation of Additional Antenna(s) on Existing Support Towers.

The following standards shall apply for the placement of antenna(s) and auxiliary support equipment on an existing wireless communication facility support tower.

A. Compatibility Review. Required for property zoned GI, CI, I, C, HC, MUC-1, MUC-2, MUE, MUD or NC.
B. Site Plan and Design Review. Required for all cases other than those identified in Section 17.80.040.A.

17.80.50 Collocation of Additional Antenna(s) on Support Structures.

The following standards shall apply for the placement of antenna(s) and auxiliary support equipment on a support

structure.

A. Compatibility Review. Required if the following exist:
   1. Property is zoned GI, CI, I, C, HC, MUC-1, MUC-2, MUE, MUD or NC; and
   2. Property is not located in the McLoughlin or Canemah Historical Conservation Districts; and
   3. Antenna(s) and auxiliary support equipment are setback a minimum of 10 feet from each edge of the support structure and do not exceed a total height of 12 feet or a total width of 8 feet, unless the antenna(s) is less than 4 inches in diameter and does not exceed a total height of 20 feet.
B. Site Plan and Design Review. Required if the property is zoned GI, CI, I, C, MUC-1, MUC-2, MUE, MUD or NC and does not meet all the criteria of Section 17.80.050.A.
C. Conditional Use Review. Required for all cases other than those identified in Sections 17.08.050.A and B.

17.80.60 Collocation of Additional Antenna(s) on Existing Utility Poles, Light Standards, and Light Poles.

The following standards shall apply for the collocation of additional antenna(s) on existing utility poles, light standards, and light poles that meet the following requirements:

A. Site Plan and Design Review. Required for property zoned GI, CI, I, C, HC, MUC-1, MUC-2, MUE, MUD or NC.
B. Conditional Use Review. Required for all cases other than those identified in Section 17.80.060.A.
C. Permits. The applicant shall apply for and obtain all permits necessary for the construction, installation, and operation of its facilities in the streets. The applicant shall pay all applicable fees due for City permits. All construction and maintenance of any and all of the applicant's Facilities within the Streets incident to the applicant's provision of telecommunications services shall, regardless of who performs installation and/or construction, be and remain the responsibility of the applicant.
D. Installation of Equipment. The applicant's facilities shall be installed and maintained in accordance with the laws of the State of Oregon and the ordinances and standards of the City regulating such construction.
E. Common Users. The applicant's facilities shall be attached to utility poles, light standards, and light poles located within the streets. The applicant shall also allow and encourage other wireless carriers to collocate facilities on the utility poles, light standards, and light poles with the applicant's facilities, provided such collocation does not interfere with the applicant's facilities or jeopardize the physical integrity of the structure and provided the owner of the structure consents to such collocation.
F. Scale of Facilities. This section establishes standards for attaching facilities to utility poles, light standards, and light poles in the streets in a manner that minimizes the facilities' potential incompatibility with adjacent uses.
   1. Facilities may be collocated on existing utility poles, light standards, and light poles, provided:
      a. Facilities do not jeopardize the physical integrity of the utility pole, light standard, or light pole;
      b. Triangular "top hat" style antenna mounts are prohibited;
      c. The device used to mount the facilities does not project more than ten (10) feet above the utility pole, light standard, or light pole;
      d. Antennas will be mounted flush with the devised referenced in Section 17.80.060.F.1.c or the existing utility pole, light standard, or light pole, within a unicell-style top cylinder, or on davit arms that are no greater than five (5) feet in length as measured from the center of the utility pole, light standard, or light pole;
      e. The visual impact of any facilities located in the streets must by minimized by utilizing the smallest antennas, equipment, and equipment cabinets available that will satisfy engineering requirements and the service objectives of the site. Whenever possible, facilities shall be painted or otherwise treated architecturally so as to minimize visual impacts;
      f. All antennas, cabling, mounting hardware, and associated microcell/equipment cabinets mounted on an existing utility pole, light standard, or light pole must be painted to match the color of the utility pole, light standard, or light pole. If cabinets require a special heat-reducing paint finish, they must be a neutral color such as beige, off-white, or light gray; and
      g. The existing utility pole, light standard, or light pole is not replaced with a taller utility pole, light standard, or light pole, except as authorized in Section 17.80.060.F.2.
   2. Replacement Utility Poles, Light Standards, and Light Poles. For purposes of this Section, "replacement utility poles, light standards, and light poles" shall mean a utility pole, light standards, or light pole that a)

replaces an existing or original utility pole, light standard, or light pole to accommodate Facilities; and b) does not result in an increase in the total number of utility, guy, or support poles in the Streets. Facilities may be attached to replacement utility poles, light standards, and light poles in the streets, provided:

a. The replacement utility poles, light standards, and light poles are of sufficient integrity to support the Facilities;
b. The replacement utility poles, light standards, and light poles, and any subsequent replacements, are no more the twenty (20) feet taller than the original utility pole, light standard, or light pole; and
c. The utility pole, light standard, or light pole the replacement utility pole, light standard, or light pole replaces is promptly removed.

3. The applicant shall not locate any facilities, such as cabinets, at grade within the streets, but may connect its facilities in the streets to facilities located on property adjacent to the streets in accordance with applicable City codes and with the permission of the adjacent property owner.

17.80.70 Construction or Modification of a Support Tower.

A. Site Plan and Design Review. Required if the following exists:
   1. Property is zoned GI, CI, I, C, MUC-2 or MUE; and
   2. No adjacent parcel is zoned for residential use.
B. Conditional Use Review. Required for all cases other than those identified in Section 17.80.070.A.
C. Prohibited Zoning Districts and Locations. No new support towers shall be permitted within the Canemah Historic Neighborhood, McLoughlin Conservation District, The Oregon Trail-Barlow Road Historic Corridor, 500 feet of the Willamette Greenway Corridor, or any new Historic Districts unless the applicant can demonstrate that failure to allow the support tower would effectively prevent the provision of communication services in that area. If the applicant makes such a demonstration, the minimum height required to allow that service shall be the maximum height allowed for the tower.

17.80.80 Site Review Process.

No wireless communications facilities, as defined in Section 17.80.020, may be constructed, collocated, modified to increase height, installed, or otherwise located within the City except as provided in this section. Depending on the type and location of the wireless communication facility, the facility shall be subject to the following review unless collocation or an increase in height was granted through a prior land use process. A Conditional Use Review shall require Site Plan and Design Review to occur concurrently with the Conditional Use Review process.

A. Compatibility Review. A wireless communication facility that, pursuant to Sections 17.80.030 – 17.80.050, is subject to a Compatibility Review shall be processed in accordance with Standards of Section 17.80.110. The criteria contained in Section 17.80.110 shall govern approval or denial of the Compatibility Review application. No building permit shall be issued prior to completion of the Compatibility Review process.
B. Site Plan and Design Review. A wireless communication facility that, pursuant to Sections 17.80.040 – 17.80.070, is subject to Site Plan and Design Review shall be processed in accordance with the Standards of Section 17.80.110 and Chapter 17.62, as applicable. The criteria contained in Section 17.80.110 and Chapter 17.62 shall govern approval or denial of the Site Plan and Design Review application. In the event of a conflict in criteria, the criteria contained in this Chapter shall govern. No building permit shall be issued prior to completion of the Site Plan and Design Review process, including any local appeal.
C. Conditional Use Review. A wireless communication facility that, pursuant to Sections 17.80.050 – 17.80.070, is subject to Conditional Use Review, shall be processed in accordance with the Standards of Section 17.80.110 and Chapter 17.56, as applicable. The criteria contained in Section 17.80.110 and Chapter 17.56 shall govern approval or denial of the Conditional Use Review application. In the event of a conflict in criteria, the criteria contained in this Chapter shall govern. No building permit shall be issued prior to completion of the Conditional Use Review process, including any local appeal.

17.80.90 Permit Application Requirements.

A. Compatibility Review Requirements – For an application under Sections 17.80.030.B.7, 17.80.040.A or 17.80.050.A, the following information is required:
   1. Application fee(s).
   2. Planning Division land use application form;
   3. A narrative of the proposed project that includes a description of the following:
      i. Need for the project;
      ii. Rationale and supporting evidence for the location; and
      iii. Description of the project design and dimensions.
      iv.A written response demonstrating compliance with each criterion listed in OCMC Chapter 17.80.110
   4. Documentation demonstrating compliance with non-ionizing electromagnetic radiation (NIER) emissions standards as set forth by the Federal Communications Commission (FCC) particularly with respect to any habitable areas within the structure on which the antenna(s) are collocated on or in structures directly across from or adjacent to the antenna(s);
   5. Documentation that the auxiliary support equipment shall not produce sound levels in excess of standards contained in Section 17.80.110.G, or designs showing how the sound is to be effectively muffled to meet those standards;
   6. Signature of the property owner(s) on the application form or a statement from the property owner(s) granting authorization to proceed with building permit and land use process;
   7. Documentation of the integrity of the support tower, support structure, utility pole, light standard, or light pole to safely handle the load created by the collocation;
   8. Elevations showing all improvements and connections to utilities; and
   9. Color simulations of the site after construction demonstrating compatibility.

B. Site Plan and Design Review. For an application under Sections 17.80.040.B, 17.80.050.B, 17.80.060.A, or 17.80.070.A the following information is required:
   1. The information required in OCMC Chapter 17.80.90.A;
   2. Pre-application notes;
   3. A written response demonstrating compliance with each criterion listed in the Site Plan and Design Review Standards of Chapter 17.62.050 and all other applicable criterion as defined by the Community Development Director; and
   4. Supplemental requirements listed in OCMC Chapter 17.80.90.D as needed.

C. Conditional Use Review. For an application under Sections 17.80.050.C, 17.80.060.B, or 17.80.070.B the following information is required:
   The information required in OCMC Chapter 17.80.90.A;
   1. Pre-application notes;
   2. A written response demonstrating compliance with each criterion listed in the Site Plan and Design Review Standards of Chapter 17.62.050, 17.56, and all other applicable criterion as defined by the Community Development Director as applicable
   3. For an application under Section 17.80.070. Construction of Modification of a Support Tower, the requirements listed under Section 17.80.090.D Supplemental Information are required;
   4. Responses to Conditional Use Review criteria under Chapter 17.56.010;
   5. For an application under Section 17.80.050.C Collocation of Additional Antenna(s) on Support Structures, rationale for being unable to collocate in areas identified in Sections 17.80.050.A and B shall be provided;
   6. For an application under Section 17.80.060.B Collocation of Additional Antenna(s) on Utility Poles, Light Standards, and Light Poles, rationale for being unable to collocate in areas identified in Section 17.80.060.A shall be provided; and
   7. For an application under Section 17.80.070.B Construction or Modification of a Support Tower, rationale for being unable to collocate in areas identified in Section 17.80.070.A shall be provided.
   8. Supplemental information listed in OCMC Chapter 17.80.90.D.

D. Supplemental Information. The applicant shall submit the following information for all applications subject to Conditional Use and Site Plan and Design Review:
   1. The capacity of the support tower in terms of the number and type of antennas it is designed to accommodate;

2. A signed agreement, as supplied by the City, stating that the applicant shall allow collocation with other users, provided all safety, structural, technological, and monetary requirements are met. This agreement shall also state that any future owners or operators will allow collocation on the tower.
3. Documentation demonstrating that the Federal Aviation Administration has reviewed and approved the proposal, and Oregon Aeronautics Division has reviewed the proposal. Alternatively, a statement documenting that notice of the proposal has been submitted to the Federal Aviation Administration and Oregon Aeronautics Division may be submitted. The review process may proceed and approval may be granted for the proposal as submitted, subject to Federal Aviation Administration approval. If Federal Aviation Administration approval requires any changes to the proposal as initially approved, then that initial approval shall be void. A new application will need to be submitted, reviewed, and approved through an additional Site Plan and Design Review or Conditional Use Review process. No building permit application shall be submitted without documentation demonstrating Federal Aviation Administration review and approval and Oregon Aeronautics Division review.
4. A visual study containing, at a minimum, a graphic simulation showing the appearance of the proposed tower, antennas, and auxiliary support equipment from at least 5 points within a 1-mile radius. Such points shall be chosen by the provider with a review and approval by the Community Development Director to ensure that various potential views are represented.
5. Documentation that one or more wireless communications service providers will be using the support tower within sixty (60) days of construction completion.
6. A site plan, drawn to scale, that includes:
   a. existing and proposed improvements;
   b. adjacent roads;
   c. parking, circulation, and access;
   d. connections to utilities, right-of-way cuts required, and easements required;
   e. a landscape plan describing the maintenance plan and showing areas of existing and proposed vegetation to be added, retained, replaced, or removed; and
   f. setbacks from property lines or support structure edges of all existing and proposed structures. Plans that have been reduced, but have not had their scale adjusted, will not be accepted as satisfying this requirement.
7. An alternatives analysis for new support towers demonstrating compliance with the Support Tower Location Requirements of Chapter 17.80.100.

17.80.100 Support Tower Location Requirements.

No new support tower shall be permitted under the provisions of Chapter 17.80.070 unless the applicant demonstrates to the satisfaction of the Community Development Director, and the results are verified by a State of Oregon certified professional engineer, that no existing collocation or modification possibility can accommodate the service needs of the applicant's proposed support tower. All proposals for new support towers must be accompanied by a statement and documentation from a qualified engineer, as determined by the Community Development Director, that the necessary service cannot be provided by collocation on, or modification to, an existing support tower or structure for one or more of the following reasons:

A. No existing support towers or support structures are located within the geographic area required to meet the applicant's engineering requirements;
B. Existing support towers or support structures are not of sufficient height to meet the applicant's engineering requirements;
C. Existing support towers or support structures do not have sufficient structural strength to support the applicant's proposed antenna(s) and related equipment.
D. The applicant's proposed antenna would cause electromagnetic interference with the antenna(s) on the existing support tower or support structure, or the existing antenna would cause interference with the applicant's proposed antenna(s);
E. The applicant demonstrates that there are other limiting factors that render existing support towers and support structures unsuitable; or
F. That fees, costs, or contractual provisions required by the owner in order to share or adapt to an existing support tower or support structure for collocation are unreasonable.

17.80.110 Design Standards.

Installation, collocation, construction, or modification of all support towers, structures, and antennas shall comply with the following standards, unless an adjustment is obtained pursuant to the provisions of Section 17.80.120.

A. Support Tower. The support tower shall be self-supporting.

B. Height Limitation. Support tower and antenna heights shall not exceed the maximum heights provided below.
   1. If the property is zoned GI, CI or I; and no adjacent parcel is zoned residential the maximum height of a support tower, including antennas, is 120 feet.
   2. If the property is zoned: a. GI, CI or I, and an adjacent parcel is zoned residential; or b. C, MUC-2 or MUE; the maximum height of a support tower, including antennas, is 100 feet.
   3. If the property is zoned MUC-1, MUD or NC; the maximum height of a support tower, including antennas, is 75 feet.
   4. For all cases other than those identified in Section 17.80.110.B.1-3 above, the maximum height of a support tower, including antennas, is 75 feet.

C. Collocation. New support towers shall be designed to accommodate collocation of additional providers.
   1. New support towers of a height greater than 75 feet shall be designed to accommodate collocation of a minimum of two additional providers either outright or through future modification of the tower.
   2. New support towers of a height between 60 feet and 75 feet shall be designed to accommodate collocation of a minimum of one additional provider either outright or through future modification of the tower.

D. Setbacks. The following setbacks shall be required from property lines, not the lease area, for support towers, auxiliary support equipment, and perimeter fencing.
   1. Support towers not designed to collapse within themselves shall be setback from all property lines a distance equal to the proposed height of the support tower.
   2. Support towers designed to collapse within themselves shall be setback from the property line a distance equal to the following:
      a. If the property is zoned GI, CI, I, C, MUC-2 or MUE; and no adjacent parcel is zoned for a residential use the underlying zone setback shall apply;
      b. If the property is zoned:
         i. GI, CI, I, C, MUC-2 or MUE and an adjacent parcel is zoned residential; or
         ii. MUC-1, MUD or NC;the setback shall be a minimum of 25 feet from all adjacent residentially zoned property lines and the underlying zoning setback for all other adjacent property lines; or
      c. For all cases other than those identified in Section 17.80.110.D.2.a and b above, the setback shall be a minimum of 25 feet from all adjacent property lines.

E. Auxiliary Support Equipment. The following standards shall be required.
   1. If the property is zoned:
      a. For GI, CI, I, MUC-1, MUC-2, C, MUD, MUE or NC, the auxiliary support equipment footprint shall not exceed an area of 340 square feet and 15 feet in height at the peak;
      b. For all cases other than those identified in Section 17.80.110.E.1.a above, the auxiliary support equipment shall be:
         i. Located in an underground vault to the maximum extent practicable; or
         ii. The applicant shall demonstrate why locating the auxiliary support equipment underground would limit the applicant's ability to fully utilize camouflage technology that might better suit the particular situation, in which case the standards of Section 17.80.110.E.1.a shall apply.
   2. Only one auxiliary accessory cabinet shall be allowed per service provider located on a support structure.

F. Landscaping. In all zoning districts, existing vegetation shall be preserved to the maximum extent practicable. Screening of a site is mandatory.
   1. If the property is zoned:
      a. GI or CI, and no adjacent parcel is zoned residential, landscaping may not be required if water quality issues are addressed and appropriate screening around the facility is proposed;
      b. For all cases other than those identified in Section 17.80.110.F.1.a above, landscaping shall be placed completely around the perimeter of the wireless communication facility, except as required to gain access. The minimum planting height shall be a minimum of 6 feet at the time of planting, densely placed so as to screen the facility. The landscaping shall be compatible with vegetation in the surrounding area, and shall

be kept healthy and well maintained as long as the facility is in operation. Failure to maintain the site will be grounds to revoke the ability to operate the facility.

c. The Community Development Director may approve an alternative landscaping plan that visually screens the facility and is consistent with the intent of this standard.

G. Noise Reduction. Noise generating equipment shall be baffled to reduce sound level measured at the property line to the following levels except during short durations for testing and operation of generators in emergency situations:

1. For any property where no adjacent parcel is zoned residential, the sound level at the property line shall not be greater than 50 dB;
2. For all other cases, the sound level shall not be greater than 40 dB when measured at the nearest residential parcel's property line.

H. Lighting.

1. Unless required by the Federal Aviation Administration or the Oregon Aeronautics Division, artificial lighting of wireless communication towers and antennas shall be prohibited.
2. Strobe lighting is prohibited unless required by the Federal Aviation Administration.
3. Security lighting for equipment shelters or cabinets and other on-the-ground auxiliary equipment shall be initiated by motion detecting lighting. The lighting shall be the minimal necessary to secure the site, shall not cause illumination on adjacent properties in excess of a measurement of 0.5 footcandles at the property line, and shall be shielded to keep direct light within the site boundaries.

I. Color.

Unless otherwise required by the Federal Aviation Administration, all support towers and antennas shall have a non-glare finish and blend with the natural background.

J. Signage.

Support towers and antenna(s) shall not be used for signage, symbols, flags, banners, or other devices or objects attached to or painted on any portion of a wireless communication facility.

K. Access Drives.

1. On a site with an existing use, access shall be achieved through use of the existing drives to the greatest extent practicable. If adequate intersection sight distance is unavailable at the existing access intersection with a City Street, an analysis of alternate access sites shall be required.
2. Site shall be serviced by an access adequate to ensure fire protection of the site.
3. New access drives shall be paved a minimum of 20 feet deep from the edge of the right-of-way (though the use of pervious paving materials such as F-mix asphalt, pavers, or geotech webbing is encouraged) and designed with material to be as pervious as practicable to minimize stormwater runoff.
4. New access drives shall be reviewed for adequate intersection sight distances.

L. Informing the City. All service providers with facilities within the City of Oregon City shall be required to report in writing to the Community Development Director any changes in the status of their operation.

1. An annual written statement shall be filed with the Planning Manager verifying continued use of each of their facilities in the City's jurisdiction as well as continued compliance with all state and federal agency regulations.
2. The report shall include any of the following changes:
   a. Changes in or loss of Federal Communication Commission license from the Federal Communication Commission to operate;
   b. Receipt of notice of failure to comply with the regulations of any other authority over the business or facility;
   c. Change in ownership of the company that owns wireless communication facility or provides telecommunications services; or
   d. Loss or termination of lease with the telecommunications facility for a period of six (6) months or longer.

17.80.120 Adjustments.

Adjustments to the standards of this chapter may be approved by the Planning Commission at a duly noticed public hearing. The Planning Commission may grant an adjustment under either of the following circumstances:

1. The Planning Commission may grant an adjustment when a gap in the applicant's service exists and the gap can only be alleviated through the adjustment of one of more of the standards in this section. If an adjustment is to be approved, the applicant must demonstrate each of the following:
   a. A gap in coverage or capacity exists in the wireless communication provider's service network that results in network users being regularly unable to connect with the provider's network, or maintain connection;
   b. The proposed facility will fill the existing service gap. The gap would be filled if the proposed facility would substantially reduce the frequency with which users of the network are unable to connect, or maintain connection, with the provider's network; and
   c. The gap cannot be filled through collocation on existing facilities, or establishment of facilities that are consistent with the standards of this section on properties other than the proposed site or on the proposed site in a manner which does not require an adjustment under this subsection.
2. The Planning Commission may grant an adjustment to a standard when the proposed adjustment would utilize existing site characteristics to minimize demonstrated or potential impacts on the use of surrounding properties. For the purposes of this subsection, site characteristics shall include, but need not be limited to, the suitability of the proposed use considering size, shape, location, topography, existence of improvements, and natural features. Applicants for an adjustment under this provision must demonstrate that the adjustment will result in a lower level of impact on surrounding properties than would be generated if the standard were not adjusted. In considering the requested adjustment, the Planning Commission may consider the following:
   a. Visual impacts;
   b. Impacts on views;
   c. Impacts on property values; and
   d. Other impacts that the Planning Commission finds can be mitigated by an adjustment so that the proposed use will have greater compliance in not altering the character of the surrounding area in a manner which substantially limits, impairs, or precludes the use of surrounding properties for the primary use listed in the underlying district.
3. Requests for adjustments under this subsection shall only be considered concurrently with the applicable Site Review Process as required by Section 17.80.080. If the Site Review Process required by Section 17.80.080 is a Compatibility Review or a Site Plan and Design Review, the inclusion of an adjustment will require that the application be subject to a Conditional Use Review under Section 17.80.090.C.

17.80.130 Temporary Facilities.

In order to facilitate continuity of services during maintenance or repair of existing installations, or prior to completion of construction of a new wireless communication facility, temporary wireless communication facilities shall be allowed subject to a Type I administrative review. Temporary wireless communication facilities shall not be in use in excess of six (6) month period. Temporary wireless communication facilities shall not have a permanent foundation, and shall be removed within thirty (30) days of suspension of service they provide.

17.80.140 Removal for Discontinuance of Service.

Any wireless communication facility that has not provided service for six (6) months shall be deemed a nuisance and subject to removal as provided in Oregon City Municipal Code Chapter 8.08. The Planning Manger may grant a six (6) month extension where a written request has been filed, within the initial six (6) months period, to reuse the support tower or antenna(s).

17.80.150 Fees.

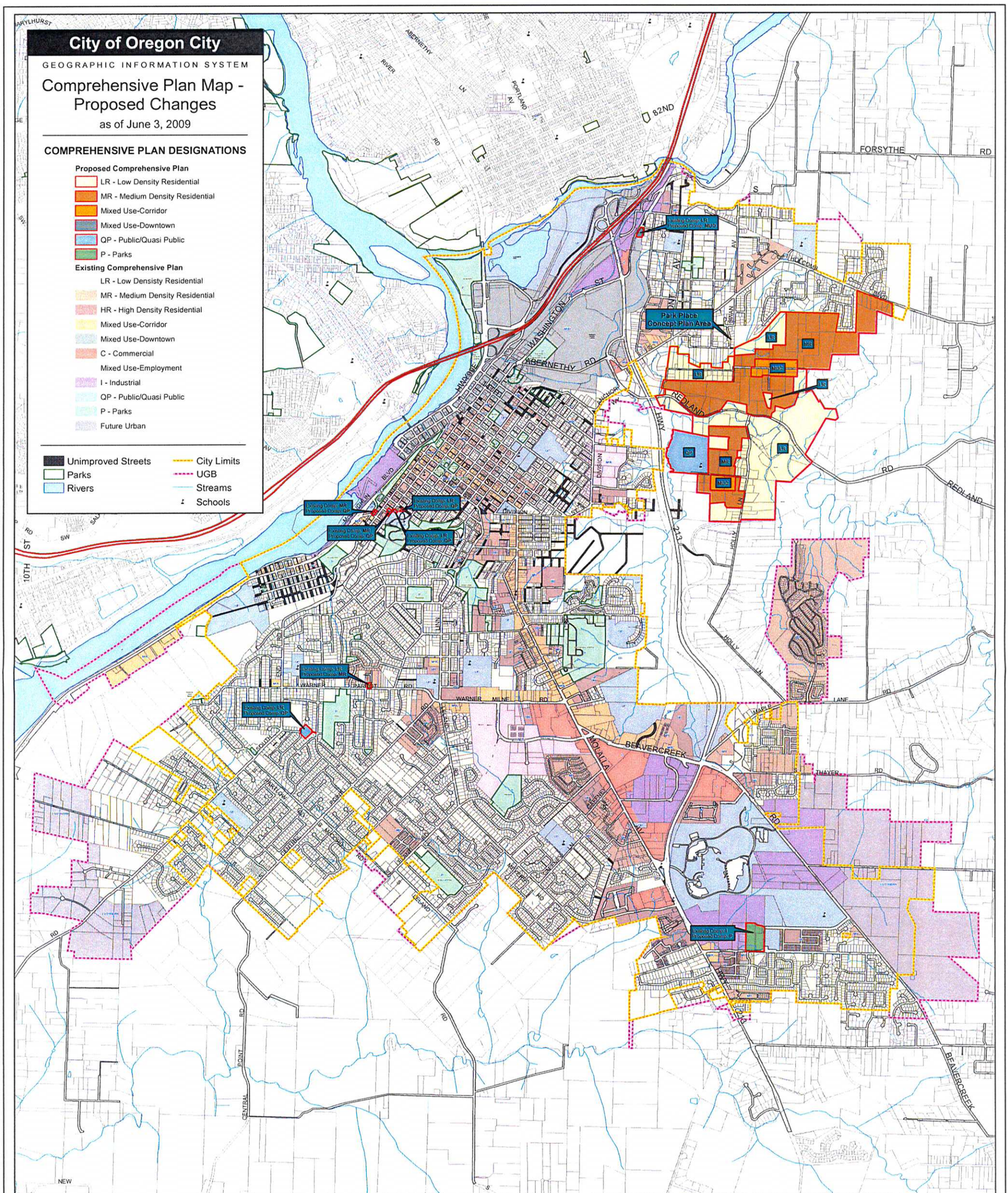
Notwithstanding any other provisions of this code, the Community Development Director may require, as part of the application fees for land use permits, an amount sufficient to recover all of the City's costs in retaining consultants to verify statements made in conjunction with the permit application, to the extent that verification requires telecommunication experts.

P = Permitted Use
C = Conditional Use
X = Prohibited Use
* = special exceptions

	MUC	NC	MUD	HC	MUE	C	GI	CI	I	R-2	R-3.5	R-5	R-6	R-8	R-10
Residential units, single-family detached;	X	X	X	P	X	X	X	X	X	X	P	P	P	P	P
Residential units, single-family attached;	X	P*	X	P	X	X	X	X	X	X	P	P*	X	X	X
Residential units, Duplex	X	P*	X	P	X	X	X	X	X	X	P	P*	X	X	X
Residential units, multi-family;	P	P	P	P	X	P	X	X	X	P	P*	P*	X	X	X
Accessory dwelling units	X	X	X	X	X	X	X	X	X	X	X	X	P	P	P
Cottage Housing	X	X	X	P	X	X	X	X	X	P	P	P	P	P	P
Live/work units	P*	P	P*	P*	X	X	X	X	X	C	C	C	X	X	X
Bed and Breakfast Inns / Boarding Houses	P	P	P	P	X	P	X	X	C	C	C	C	C	C	C
Hotels and motels, commercial lodging	P	C	P	C	C	P	X	X	C	X	X	X	X	X	X
Parks, playgrounds, playfields and community or neighborhood centers;	P	P	C	P	P	P	X	P	P	P	P	P	P	P	P
Home occupations	P	P	P	P	X	P	X	X	X	P	P	P	P	P	P
Temporary real estate offices in model dwellings located on and limited to sales of real estate on a single piece of platted property upon which new residential buildings are being constructed;	P	P	P	P	X	P	X	X	X	P	P	P	P	P	P
Accessory buildings	X	X	X	P	X	X	X	X	X	P	P	P	P	P	P
Family day care provider, subject to the provisions of Section 17.54.050;	P	P	P	P	X	P	X	X	P	P	P	P	P	P	P
Farms, commercial or truck gardening and horticultural nurseries on a lot not less than twenty thousand square feet in area (retail sales of materials grown on site is permitted);	X	X	X	X	X	X	X	X	P	X	P	P	P	P	P
Golf courses, except miniature golf courses, driving ranges or similar commercial enterprises;	X	X	X	X	X	X	X	P	P*	C	C	C	C	C	C
Cemeteries, crematories, mausoleums and columbariums;	X	X	X	X	X	X	X	C	C	C	C	C	C	C	C
Child care centers and nursery schools;	P	P*/C	P	P	P	P	X	C	P*	C	C	C	C	C	C
Public and/or Private educational or training facilities	C	C	C	C	P*	C	X	P	P	C	C	C	C	C	C
Emergency service facilities (police and fire), excluding correctional facilities;	C	C	C	C	P	C	P	C	C	C	C	C	C	C	C
Religious institutions;	C	C	P	C	C	C			P*	C	C	C	C	C	C
Banquet, conference facilities and meeting rooms;	P	P*/C	P	P	P	P	X	C	P	C	C	C	C	C	C
Museums, libraries and cultural facilities;	P	P*/C	P	P	P	P	X	X	P*	C	C	C	C	C	C
Health and fitness clubs;	P	P*/C	P	P	P	P	X	X	P*	X	X	X	X	X	X
Medical and dental clinics, outpatient; infirmary services;	P	P*/C	P	P	P	P	X	P	X	X	X	X	X	X	X
Residential Home per ORS 443.400	P	P	P	P	X	P	X	X	X	X	P	P	P	P	P
Residential Care Facility;	P	P	P	P	X	P	X	X	P*/C	P	C	C	C	C	C
Assisted living facilities; nursing homes and group homes for over 15 patients	P	P*/C	P	P	X	P	X	X	P*/C	X	C	C	C	C	C

	MUC	NC	MUD	HC	MUE	C	GI	CI	I	R-2	R-3.5	R-5	R-6	R-8	R-10
Office	P	P*/C	P	P	P	P	X	X	P*	P*	X	X	X	X	X
Outdoor markets, such as produce stands, craft markets and farmers markets that are operated on the weekends and after six p.m. during the weekday;	P	P*/C	P	P	P	P	X	X	P	X	X	X	X	X	X
Postal services;	P	P*/C	P	P	P	P	X	X	P	X	X	X	X	X	X
Restaurants, eating and drinking establishments	P	P*/C	P	P	P*	P	X	P*	C	X	X	X	X	X	X
Services, including personal, professional, educational and financial services; laundry and dry-cleaning;	P	P*/C	P*/C	P	P*	P	P*	P*	X	X	X	X	X	X	X
Retail trade including grocery, speciality, clothing, etc.	P	P*/C	P*/C	P	P*	P	P*	P*	P*	X	X	X	X	X	X
Seasonal sales, subject to OCMC Chapter 17.54.060	P	P*/C	P	P	X	P	X	X	X	X	X	X	X	X	X
Studios and galleries, including dance, art, photography, music and other arts;	P	P*/C	P	P	X	P	X	X	P	X	X	X	X	X	X
Outdoor markets that do not meet 17.29.020.H	C	C	C	C	C	P	X	X	X	X	X	X	X	X	X
Utilities: basic and linear facilities, such as water, sewer, power, telephone, cable, electrical and natural gas lines, not including major facilities such as sewage and water treatment plants, pump stations, water tanks, telephone exchanges and cell towers.	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Public utilities, including sub-stations (such as buildings, plants and other structures);	C	C	C	C	C	C	P	C	C	C	C	C	C	C	C
Drive-in or drive-through facilities	C	C	C	C	C	P	X	X	X	X	X	X	X	X	X
Gas stations	C	C	C	C	X	P	X	X	X	X	X	X	X	X	X
Custom or specialized vehicle alterations or repair wholly within a building.	X	X	X	X	P*	P	X	X	X	X	X	X	X	X	X
Hospitals	C	X	C	C	P	C	C	X	X	X	X	X	X	X	X
Veterinary clinics or pet hospitals	P	P*/C	P	P	C	P	P	X	X	X	X	X	X	X	X
Repair shops, for radio and television, office equipment, bicycles, electronic equipment, shoes and small appliances and equipment;	P	P*/C	P	P	X	P	X	X	X	X	X	X	X	X	X
Heavy equipment service, repair, sales, storage or rental (including but not limited to construction equiptment, and machionery and farming equiptment)	X	X	X	X	X	X	P	X	X	X	X	X	X	X	X
Kennels	X	X	X	X	X	X	P	X	X	X	X	X	X	X	X
Motor vehicle sales and/or incidental service	X	X	X	X	X	P	X	X	X	X	X	X	X	X	X
Motor vehicle repair and/or service	X	X	X	X	P*	P	X	X	X	X	X	X	X	X	X
Storage facilities	X	X	X	X	X	C	P	X	X	X	X	X	X	X	X
Indoor Entertainment Centers and Arcades	P	P*/C	P	P	X	P	X	X	X	X	X	X	X	X	X
Passenger terminals (water, auto, bus, train)	C	C	C	C	P	P	X	X	P	X	X	X	X	X	X
Marina	X	X	P	X	X	X	X	X	P	X	X	X	X	X	X
Recking yards	X	X	X	X	X	X	P	X	X	X	X	X	X	X	X
Stadiums and arenas	C	C	C	C	C	C	C	X	X	P	C	C	C	C	C
Parking structures and lots not in conjunction with a primary use	C	X	C	C	X	X	X	X	C	X	X	X	X	X	X

	MUC	NC	MUD	HC	MUE	C	GI	CI	I	R-2	R-3.5	R-5	R-6	R-8	R-10
Industrial uses limited to the design, light manufacturing, processing, assembly, packaging, fabrication and treatment of products made from previously prepared or semi-finished materials;	X	X	X	X	P	X	P	P	X	X	X	X	X	X	X
Correctional, detention and work release facilities	X	X	X	X	C	X	X	X	C	X	X	X	X	X	X
Distribution, wholesaling and warehousing	X	X	C	X	P	X	P	C	X	X	X	X	X	X	X
Manufacturing and/or fabrication	X	X	X	X	X	X	P	P*	X	X	X	X	X	X	X
Heavy equipment service, repair, sales, rental or storage (includes but is not limited to construction equipment and machinery and farming equipment);	X	X	X	X	X	X	P	X	X	X	X	X	X	X	X
Research and development activities	P	P*/C	P	P	P	P	X	P	P*	X	X	X	X	X	X
Outdoor sales or storage	X	X	X	X	X	X	P*	X	X	X	X	X	X	X	X
Recycling center and/or solid waste facility	X	X	C	X	X	X	P	X	X	X	X	X	X	X	X



The City of Oregon City makes no representations, express or implied, as to the accuracy, completeness and timeliness of the information displayed. This map is not suitable for legal, engineering, or surveying purposes. Notification of any errors is appreciated.

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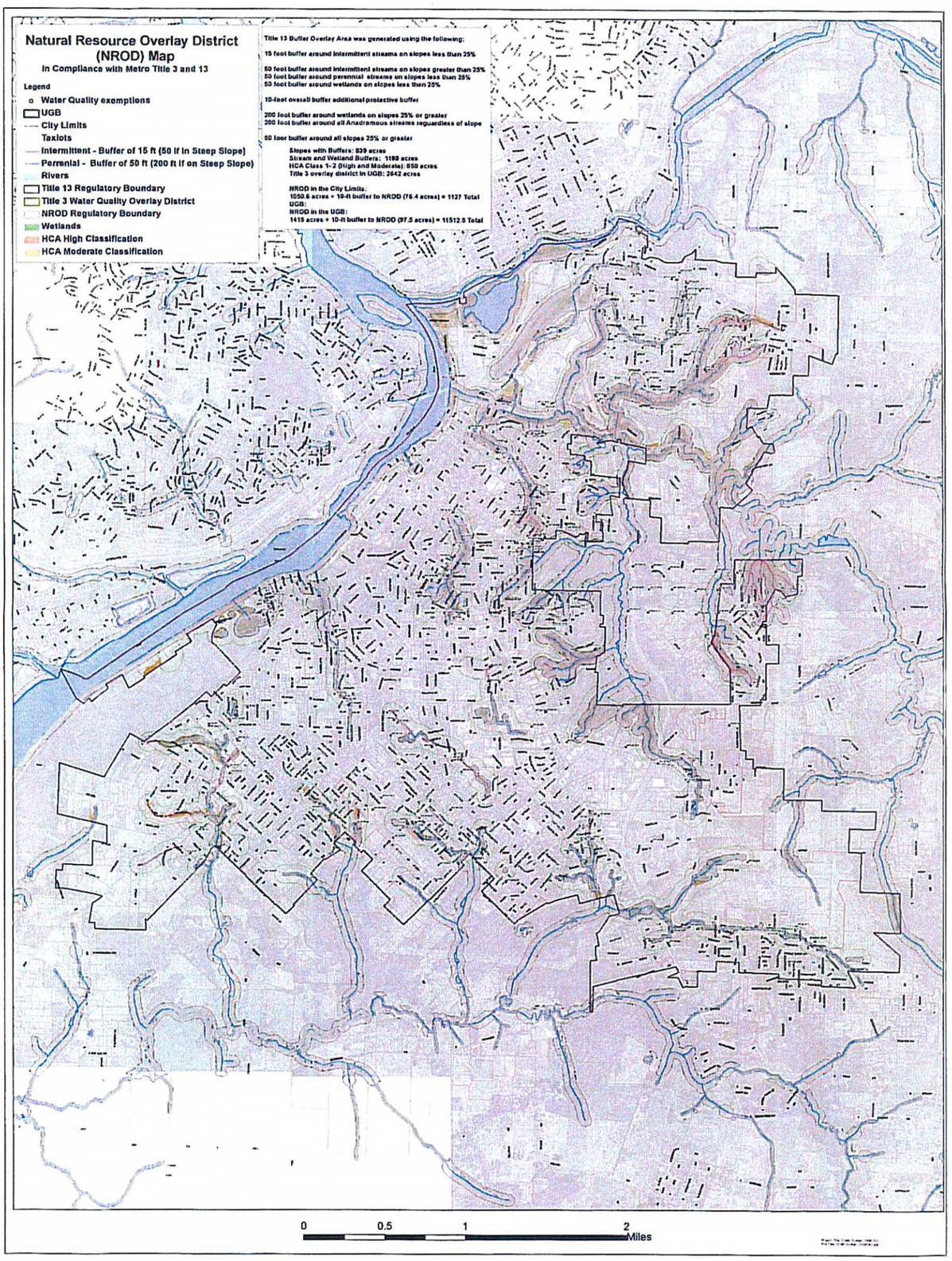
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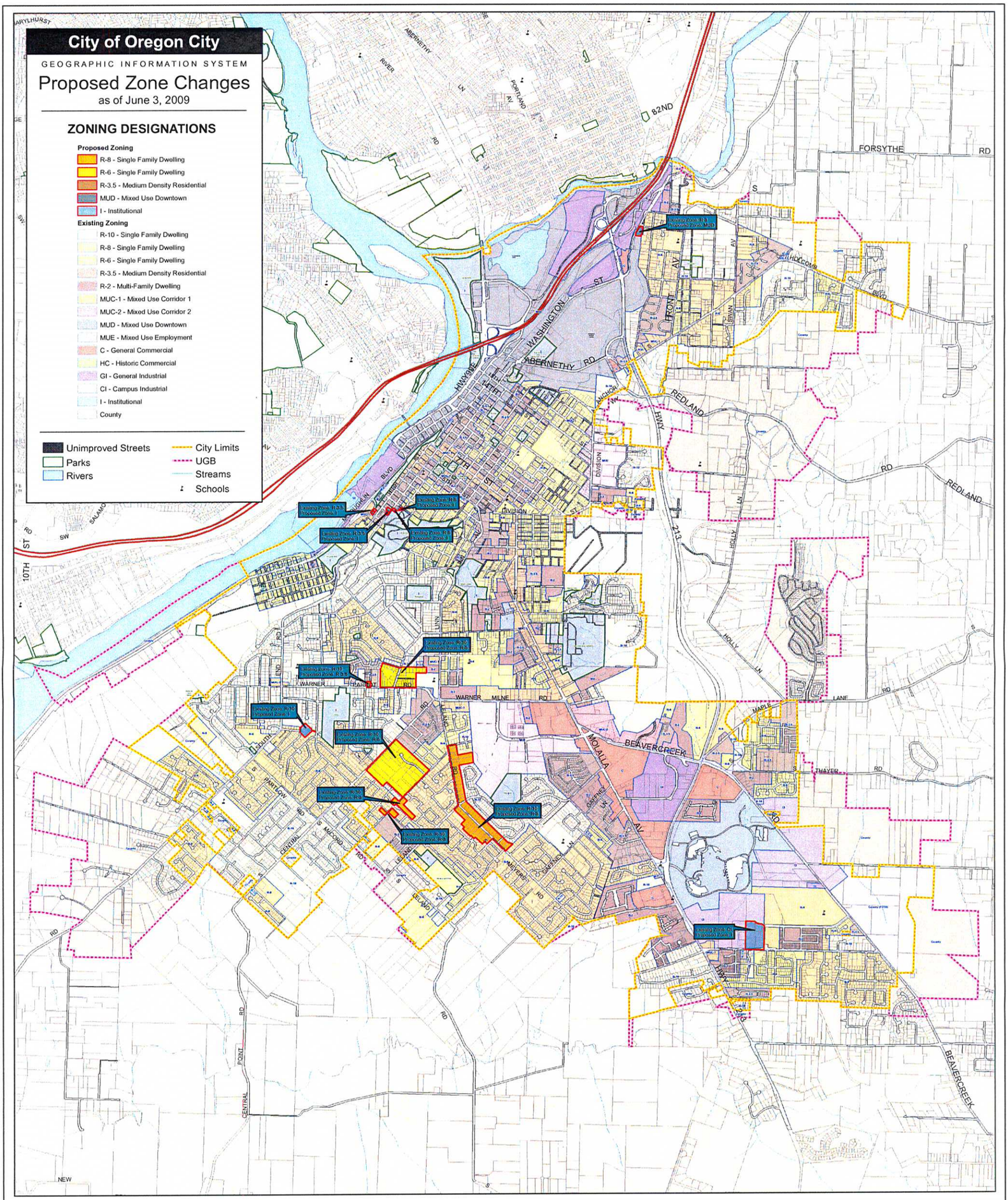
0.5 0.25 0 0.5 1 Miles

2,000 1,000 0 2,000 4,000 6,000 8,000 Feet

City of Oregon City
P.O. Box 3040
320 Warner Milne Rd.
Oregon City, OR 97045
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Plot date: June 3, 2009
Plot name: Comprehensive Map with Proposed Changes - 36x48P - 20090603.pdf
Map name: Comprehensive Map with Proposed Changes - 36x48P.mxd


Natural Resource Overlay District (NROD) Map
In Compliance with Metro Title 3 and 13
Legend
Water Quality exemptions
UGB
City Limits
Taxlots
Intermittent - Buffer of 15 ft (50 if in Steep Slope)
Perrenial - Buffer of 50 ft (200 ft if on Steep Slope)
Rivers
Title 13 Regulatory Boundary
Title 3 Water Quality Overlay District
NROD Regulatory Boundary
Wetlands
HCA High Classification
HCA Moderate Classification
Title 13 Buffer Overlay Area was generated using the following:
15 foot buffer around intermittent streams on slopes less than 25%
50 foot buffer around intermittent streams on slopes greater than 25%
50 foot buffer around perennial streams on slopes less than 25%
50 foot buffer around wetlands on slopes less than 25%
10-foot overall buffer additional protective buffer
200 foot buffer around wetlands on slopes 25% or greater
200 foot buffer around all Anadromous streams regardless of slope
50 foor buffer around all slopes 25% or greater
Slopes with Buffers: 839 acres
Stream and Wetland Buffers: 1193 acres
HCA Class 1-2 (High and Moderate): 850 acres
Title 3 overlay district in UGB: 2642 acres
NROD in the City Limits:
1050.6 acres + 10-ft buffer to NROD (76.4 acres) = 1127 Total
UGB:
NROD in the UGB:
1415 acres + 10-ft buffer to NROD (97.5 acres) = 11512.5 Total
0
0.5
1
2
Miles



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N W E S

0.5 0.25 0 0.5 1 Miles

2,000 1,000 0 2,000 4,000 6,000 8,000 Feet

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OREGON CITY

Plot date: June 3, 2009
Plot name: Zoning Map with Proposed Zoning Changes - 36x48P - 20090003.pdf
Map name: Zoning Map with Proposed Zoning Changes - 36x48P.mxd

Natural Resource Overlay District (NROD) Map

- Rivers
- UGB
- City Limits
- Contours - 10 ft
- Streams - piped
- Perrenial Streams
- Intermittent Streams
- NROD Boundary
- Taxlots
- NROD Boundary (2009 Title13)
- RIV_FILL

The Natural Resource Overlay District boundary includes all known water resource protection, habitat areas, and associated vegetated buffer areas regulated under OCMC 17.49.

Natural Resource Overlay District

City of Oregon City
Geographic Information Systems
PO Box 3040
320 Warner Milne Rd.
Oregon City, Oregon 97045
www.orcity.org | maps.orcity.org

The information in this map is detailed in Chapter 17.49 -- Municipal Code of the City of Oregon City

N W E S

Project: Title-13-NROD-map_20090716-no_aerial.mxd
Plot:Title-13-NROD-map_20090716-no_aerial.pdf