OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

EXHIBIT 1.

CONDITIONS OF APPROVAL
SP 14-01

Public Works / Engineering Development Services Division

1. The Applicant is responsible for this project's compliance with Engineering Policy 00-01, and for design of facilities in compliance with City design standards. The policy pertains to any land use decision requiring the Applicant to provide any public improvements. This includes attending a pre-design meeting with the City.
2. Prior to final plat approval, the Applicant shall sign a Non-Remonstrance Agreement for the purpose of making sanitary sewer, storm sewer, water and/or street improvements in the future that benefit the Property and assessing the cost to benefited properties pursuant to the City's capital improvement regulations in effect at the time of such improvement.
3. Prior to final construction plan approval, the Applicant shall provide an Erosion Prevention and Sedimentation Control Plan suitable to the Public Works Department to meet the Public Works requirements for erosion control. The Applicant shall provide a Preliminary Grading Plan to the City for review prior to the approval of construction plans. A final site Grading Plan shall be required as part of the final construction plans per the City's Grading Criteria and the International Building Code. If significant grading is required due to its location or the nature of the site, rough grading shall be required of the developer prior to the acceptance of the public improvements. There shall not be more than a maximum grade differential of two (2) feet at all site boundaries. Grading shall in no way create any water traps, or other ponding situations. Prior to final construction plan approval, provide final geotechnical report.
4. The water system shall consist of a master meter assembly owned by CRW capable of accurately providing and metering domestic and fire flow quantities. Following the master meter the distribution system shall be constructed as a standard City system with main lines, services, meters and fire hydrants. The water distribution system shall be designed to meet City design standards.
5. The proposed water line within the easement in the alley loops behind buildings A1 and A3 shall be deleted, and all the water services to the buildings fronting Beavercreek Road shall be from the proposed new water line in Beavercreek Road.
6. All water services shall comply with the City's standards for backflow prevention, including the larger buildings, community center and pool shall have appropriate back flow prevention devices on the water services.
7. Water service for the proposed development shall be provided by the City through a master meter owned by CRW. The specific terms and provisions for water service shall be provided through an intergovernmental agreement (IGA) between the City and CRW. Requirements for water service include:
    a. Prior to submitting construction plans to the City, an IGA between the City and CRW providing the terms and provisions for water service to the development must be executed.
    b. Prior to construction plan approval and after the execution of the proposed IGA, the applicant shall receive CRW's written approval of design plans and specifications for the water facilities agreed upon through the IGA.

c. The applicant shall be responsible for all costs associated with the design and construction of a water line and meter sized to meter domestic and fire flows. The cost would include hydraulic modeling by CRW as well as review and inspection.

d. Once constructed and accepted the water distribution system would be donated to the City to be maintained and operated.

e. The master meter and vault assembly would be donated to CRW to be operated and maintained.

8. Prior to construction plan approval, the Applicant shall submit the proposed development plans to Clackamas County Fire District No. 1 for review and incorporate all Fire District requirements in the construction plans as applicable, and prior to final plat approval the Applicant shall install any required fire hydrants. (Clackamas Fire District #1)

9. The sanitary sewer collection system shall be designed to meet City design standards.

10. The proposed 8-inch sanitary sewer line within the easement in the alley loops behind buildings A1 and A3 shall be deleted, and relocated to Beavercreek Road. All the services to the buildings fronting Beavercreek Road shall be from the proposed new sanitary sewer line in Beavercreek Road. This pipe shall be designed with consideration for connection to a future 15-inch pipe in Beavercreek Road to allow for future transfer to the Beavercreek basin.

11. A final stormwater drainage report which reflects the final design shall be completed and submitted. The final report shall address downstream impacts in more detail taking into account the change in discharge location. The final report shall also reflect the final site plan, potential for over-detention and potential changes to the storm facilities on Beavercreek Road.

12. The applicant shall sign a standard "Maintenance Covenant and Access Easement". The developer will be responsible for operating and maintaining the private stormwater facilities including collection piping, detention and treatment facilities. The City will be given access to inspect the storm water facilities, and require maintenance and/or repairs be done.

13. Treatment of stormwater runoff from the two private parking lots (behind buildings A2 and A3) shall be required prior to discharge into the public storm system. This could be in the form of LID methods or a cartridge filter.

14. Stormwater treatment is not provided for Meyers Road. The applicant will need to provide treatment such as an LID method prior to discharge to the public system. This would be consistent with the Beavercreek Concept Plan. (DS)

15. The applicant has indicated that they may construct a stormwater swale along Beavercreek Road located between the proposed on-street parking and sidewalk. This will cause people to either walk through the stormwater swale or on Beavercreek Road until they can access a crosswalk. The applicant will need to address this issue through modifying the swale design to incorporate pedestrian egress zone with sidewalk connectors across the stormwater swale. If stormwater swales are not constructed, , the applicant shall meet the requirements of providing stormwater detention and treatment through the other proposed stormwater facilities and over detention within the proposed stormwater pond as may be determined through the final stormwater management plan.

16. The final solution for the storm water facilities on Beavercreek Road shall be coordinated with the City and the County. Drainage facilities shall be in conformance Tri-City Service District #4 regulations and Clackamas Roadway Standards, Chapter 4 . Any surface water runoff from the site to the Beavercreek Road right-of-way shall be detained outside of the right-of-way in conformance with Clackamas Roadway Standards. Any surface water runoff discharged to the Beavercreek Road right-of-way will only be allowed if it can be shown that the existing system has the capacity to accept the runoff and no adverse downstream impacts will be created.

17. Ten-foot public utility easements along all street frontages and all easements required for the final engineering plans shall be dedicated to the public on the final plat. All existing and proposed utilities and easements shall be indicated on the construction plans. Any off-site utility easements required for this

project, such as for work on the storm outfall, shall be obtained and submitted to the City prior to approval of the construction plans.

18. Street "A" and Street "B" shall be local streets that are similar to the Beavercreek Road Concept Plan for a neighborhood "greenstreet". There shall be a 62-foot right-of-way dedication.
19. The street section for Street "A" and "B" shall include, but is not to be limited to, base rock, paved street width of 40-foot of pavement, curb and gutter, a 5.5-foot planter strip and a 5-foot sidewalk, curb return radii, curb (handicap) ramps, centerline monumentation in monument boxes, traffic control devices, street trees, and street lights. There shall be parallel parking on both sides of the street. There shall also be curb extensions at the street intersections.
20. Mid-block curb extensions will not be allowed. The applicant shall provide revised plans for the re-configuration, re-location or elimination of the 90-degree parking spaces.
21. The western end of the public portion of Street "B" shall be at the "T" with the two alley loops. The two alley loop shall be private, and shall have public access easements over them.
22. Meyers Road shall be minor arterial constructed similar to the Beavercreek Road Concept Plan for a collector "greenstreet". There shall be an 86-foot right-of-way dedication.
23. Meyers Road shall include, but is not to be limited to, base rock, paved street width of 64-foot of pavement, curb and gutter, a 7.5-foot planter strip and a 5-foot sidewalk, curb return radii, curb (handicap) ramps, centerline monumentation in monument boxes, traffic control devices, stripping, street trees, and street lights. There shall be parallel parking on both sides of the street, and bike lanes.
24. Beavercreek Road shall be major arterial constructed similar to the Beavercreek Road Concept Plan. There shall be a 92-foot right-of-way. The right-of-way dedication shall be sufficient to provide 47-feet of ROW from the centerline on the easterly side of the road (the side where the proposed development is located).
25. Beavercreek Road shall include, but is not to be limited to, base rock, paved street width of 32-foot of pavement from centerline (8-foot interim planting area, 6-foot bike lane, 12-foot travel lane and half of the 12-foot turning lane), curb and gutter, a 7.5-foot storm swale/planter strip and a 7-foot sidewalk, curb return radii, curb (handicap) ramps and end of sidewalk ramps, centerline monumentation in monument boxes, traffic control devices, stripping, street trees, and street lights. Appropriate pavement tapers shall be provided, per Clackamas County Roadway Standards Section 250.6.4. There shall be an 8-foot interim planting area.
26. At the intersection of Beavercreek Road and Meyers Road there shall be two travel lanes and one turn lane on both streets.
27. Beavercreek Road is Clackamas County jurisdictional right-of-way; final street improvements on Beavercreek Road shall be in compliance with Clackamas County Roadway Standards. (DS)
28. The applicant shall provide access control strips across the ends of Meyers Road, Street "A" and Street "B" where they stop at the edge of the development.
29. The sidewalk that connects Street "B" to Beavercreek Road shall be in a 15-foot wide public access easement.
30. The driveway entrances to the four private parking lots shall be designed for two way traffic, and shall be a minimum of 24-feet wide.
31. The driveway entrance on Meyers Road shall be approximately 240 feet from the intersection of Beavercreek Road. The driveway entrance on Street "A" shall be approximately 100 feet from the intersection of Meyers Road. The two driveway entrances on Street "B" shall be approximately 160 feet from the intersection of Street "A".
32. The intersection angle between Meyers Road and Beavercreek Road shall be 80 degrees. (DS)

33. Where pavement cuts are made in existing streets for the installation of improvements, the restoration shall be done in accordance with the City of Oregon City Pavement Cut Standards, or Clackamas County standards in County ROW's.

34. The applicant shall provide 8-inch sanitary sewer collection system in the existing and future public right-of-way with the connection to the existing collection system at the manhole located in Meyers Road at Emerson Court. A short section of the collection system shall be located in a 15-foot wide public easement that extends from the western end of "B" Street to the Beavercreek Road ROW.

35. The applicant shall refer to the City's standard for typical utility placement within the public street section for location of underground utilities.

36. The applicant shall pay a fee-in-lieu for an 8-inch pipe along the northerly frontage of the development on Beavercreek Road (from the northerly development boundary to Meyers Road). This fee-in-lieu shall be based upon costs for design and construction for a public agency construction project. An estimate of this cost shall be provided to the City for review and approval.

37. The applicant shall pay fee-in-lieu of downstream improvements in the Glen Oak Basin required due to the cross basin connection. The amount of the fee-in-lieu shall be $545,000 in accordance with the documentation provided in the "Public Works Engineering File Memorandum" (November 5, 2014).

38. The new water system shall include a minimum 12-inch main in Beavercreek Road from Glen Oak Road at the proposed master meter to Meyers Road, and 8-inch water mains throughout the site. The system shall be designed to loop the water lines as much as possible.

39. The new water lines shall be located within public right-of-way to the maximum extent possible. From the westerly end of proposed street "B" to the ROW of Beavercreek Road there shall be a 15-foot wide easement for water line.

40. A signal modification for the Beavercreek/Meyers signal shall be approved by Clackamas County Traffic Engineering, including signal pole locations, lane configuration, signal detection and signal phasing. The applicant shall also provide queuing estimates for the Beavercreek/Meyers intersection prior to the approval of the improvement plans.

41. The applicant shall provide funds to construct school zone flashers on Beavercreek Road to replace the existing school speed zone signs in the vicinity of the project site.

42. The applicant shall provide minimum intersection sight distance at the intersection of the new Meyers Road intersection with Beavercreek Road. In addition, no plantings at maturity, retaining walls, embankments, fences or any other objects shall be allowed to obstruct vehicular sight distance. Minimum sight distance is 500 feet in each direction. Sight distance shall be measured from a point 14.5 feet back from the edge of the travel lane at a driver's eye height in the driveway of 3.5 feet to a vehicle height of 3.5 feet in the oncoming travel lanes. The applicant shall demonstrate sight lines and compliance with minimum intersection sight distance as part of the Development Permit for the project.

43. The applicant shall submit an Engineer's cost estimate to be approved by Clackamas County Engineering for the asphalt concrete, aggregates, and any other required public improvement in the Beavercreek Road right-of-way.

44. Prior to commencement of site work the applicant shall obtain a Development Permit from Clackamas County for design and construction of required improvements to Beavercreek Road. To obtain the Permit, the applicant shall submit plans prepared and stamped by an Engineer registered in the State of Oregon, provide a Performance Guarantee, and pay an Inspection Fee. The Performance Guarantee is 125% of the approved Engineer's cost estimate for the required improvements.

45. Prior to commencement of utility work within the Beavercreek Road right-of-way a Utility Placement Permit shall be obtained from the Clackamas County.

46. Prior to commencement of any work, including grading, and prior to issuance of the Clackamas County Development and Utility Placement permits, the contractor shall: Provide a traffic control plan for review and approval from Clackamas County's Engineering Office. Provide a certificate of liability insurance,

naming the County as additionally insured. Obtain separate "Street Opening Permits" for utility installations within the County right-of-way. The applicant shall obtain these permits from the Engineering office prior to the issuance of the Development Permit.

47. The applicant shall pay a fee-in-lieu of improvements for the proportional share, 14 percent, of costs to construct the right-turn lane from Meyers Road to northbound OR213. The fee-in-lieu amount is $50,400.

Community Development / Planning Division

1. Prior to issuance of building permits, the applicant shall include the details indicating the required number and extent of pedestrian amenities within the pedestrian amenity areas required by OCMC 17.62.055.D in front of all buildings on the applicable site plan sets (landscaping, etc.).
2. The applicant proposed to name the two new public cross streets at a later time. Those names will comply with the City's adopted street naming policy.
3. Street tree species shall be selected from the adopted Oregon City Street Tree List or as recommended by a Certified Arborist or Landscape Architect and shall be planted in accordance with Chapter 12.08 to promote and maintain the community tree canopy adjacent to public streets. Revised and Final street tree plans shall be submitted for review at the time of construction plan review by the City Engineer (Revised Street Tree Plan) and following approval of Construction Documents by the City Engineer (Final Street Tree Plan).
4. Prior to issuance of building permits, the applicant shall provide a revised plan set indicating common pedestrian path connections in the areas described in the bullet points below in order to provide safe and convenient pedestrian access throughout the site, with concurrent revisions to landscaping and civil plan sets.
    - The large landscaped island situated between Buildings A3 and T2 - there is no common pedestrian path connection to Beavercreek Road in this location. Pedestrian would be forced to walk in the vehicle drive aisles to traverse the property from southeast to northwest.
    - The large landscaped island situated between Buildings A1 and T7 - there is no common pedestrian path connection to Beavercreek Road in this location. Pedestrian would be forced to walk in the vehicle drive aisles to traverse the property from southeast to northwest.
    - Between Buildings T6 and T7 - there is no common pedestrian path connection to Beavercreek Road in this location;
    - Between Buildings T1 and T2 – there is no common pedestrian path connection to Beavercreek Road in this location.
5. Prior to issuance of building permits, the applicant shall provide revised plans for a public pedestrian accessway to connect the dead-end Street B with the public sidewalk along Beavercreek Road. The public pedestrian accessway in this location shall be designed in accordance with the standards A-K of OCMC section 12.04.199 and shall be completed with the public streets prior to issuance of any building permit for the property.
6. Prior to issuance of a building permits, the applicant shall confirm to the satisfaction of the Planning Director that screening of mechanical equipment conforms as the applicant has proposed. Revised or supplemental plans indicating the appropriate screening shall be submitted if required by the Planning Director.
7. Prior to issuance of building permits the applicant shall submit revised plans that provide a minimum of three amenities selected from list D1 of section 17.62.055D for the pedestrian amenity area at the northern corner of Building A1 where the setback exceeds twenty feet. Below in this area on the revised building plans prior to issuance of a building permit.
8. Prior to issuance of a certificate of occupancy for any of the live-work units, the applicant shall record a deed restriction or other document prepared for approval by the City Attorney that includes the applicable restrictions of section 17.54.105.F.(1-4) which shall be recorded with the County Recorder's

office. Said document shall bind the owner, heirs and assigns in perpetuity unless extinguished with prior approval of the Oregon City Community Development Director.

9. Prior to issuance of a building permit for any building on the site, the applicant shall provide structural and architectural details on the submitted building permit application and plan set, to demonstrate to the satisfaction of the Oregon City Building Official and Planning Director that proposed window designs on all facades meet the minimum distance of 2" recess or projection from the building facades as required by OCMC section 17.62.057(L) – Window Design.
10. Prior to issuance of a certificate of occupancy the applicant shall provide a revised lighting plan that shows how the pedestrian circulation system, including the pedestrian accessways, will be adequately illuminated pursuant to OCMC 17.62.065 D.7 and Table 1-17.62.065.
11. Prior to issuance of building permits, the applicant shall provide a revised parking plan that identifies 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.
12. The applicant's transportation engineer shall provide an analysis and explanation showing that the proposed configuration is safe and does not create unsafe maneuvering conditions in the public right-of-way, otherwise the applicant shall provide revised plans for the re-configuration, re-location of elimination of the 90-degree parking spaces.
13. Should performance guarantees be required in order to assure completion of specific site improvements prior to issuance of a certificate of occupancy the applicant shall provide such guarantees in a form approved by the city attorney.
14. Applicant shall provide revised landscaping plans indicating the location, size and type of mitigation trees on a revised landscaping plan prior to issuance of a final certificate of occupancy for the site. All mitigation trees shall be identified separately from and in addition to any standard required landscaping trees required under Chapter 17.62, street trees required under Chapter 12.08, and parking lot trees required under Chapter 17.52.

OREGON CITY
Community Development – Planning
221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

LAND USE APPLICATION FORM

Type I (OCMC 17.50.030.A)	Type II (OCMC 17.50.030.B)	Type III / IV (OCMC 17.50.030.C)
❑ Compatibility Review	❑ Extension	❑ Annexation
❑ Lot Line Adjustment	❑ Detailed Development Review	❑ Code Interpretation / Similar Use
❑ Non-Conforming Use Review	❑ Geotechnical Hazards	❑ Concept Development Plan
❑ Natural Resource (NROD) Verification	❑ Minor Partition (<4 lots)	❑ Conditional Use
	❑ Minor Site Plan & Design Review	❑ Comprehensive Plan Amendment (Text/Map)
	❑ Non-Conforming Use Review	❑ Detailed Development Plan
	☒ Site Plan and Design Review	❑ Historic Review
	❑ Subdivision (4+ lots)	❑ Municipal Code Amendment
	❑ Minor Variance	❑ Variance
	❑ Natural Resource (NROD) Review	❑ Zone Change

SP 14-01

File Number(s): _____

Proposed Land Use or Activity: Apartment & Live-work Apartment Development

Project Name: _____ Number of Lots Proposed (If Applicable): 1

Physical Address of Site: 19896 Beavercreek Road, Oregon City 97045

Clackamas County Map and Tax Lot Number(s): 3-2E-10C-00800

Applicant(s):

Applicant(s) Signature: _____

Applicant(s) Name Printed: Andrew Brand - Beavercreek Road, LLC Date: 1/21/14

Mailing Address: 600 University St. Suite 1708 Seattle, WA 98101

Phone: 206-535-6248 Fax: _____ Email: andrew@evergreenhd.com

Property Owner(s):

Property Owner(s) Signature: _____

Property Owner(s) Name Printed: Beavercreek Road, LLC Date: 1/21/14

Mailing Address: 600 University St. Suite 1708 Seattle, WA 98101

Phone: 206-535-6248 Fax: _____ Email: andrew@evergreenhd.com

Representative(s):

Representative(s) Signature: _____

Representative (s) Name Printed: Andrew Brand Date: 1/21/14

Mailing Address: 600 University St. Suite 1708 Seattle, WA 98101

Phone: 206-535-6248 Fax: _____ Email: andrew@evergreenhd.com

All signatures represented must have the full legal capacity and hereby authorize the filing of this application and certify that the information and exhibits herewith are correct and indicate the parties willingness to comply with all code requirements.

SITE PLAN & DESIGN REVIEW CHECKLIST

The application will not be deemed complete without all of the requirements proceeding.

City of Oregon City, Community Development Department, 320 Warner Milne Road, P.O. Box 3040, Oregon City, OR 97045, (503) 657-0891
www.orcity.org

1. ✓ **Complete Application Form**

2. ✓ **A List of All Permit Approvals Sought by the Applicant**

3. ✓ **Narrative**
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 and any other information indicated by staff at the preapplication conference as being required.

4. ✓ **Review Criteria**
A response addressing each section of Chapters 17.52, 17.62 and any other applicable chapter identified in the Oregon City Municipal Code.

5. ✓ **Site Plan**
A detailed site development plan showing:
   - ☑ ✓ Vicinity information showing streets and access points, pedestrian and bicycle pathways, transit stops and utility locations
   - ☑ ✓ 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
   - ☑ ✓ Contour lines at two foot contour intervals for grades zero to ten percent, and five-foot intervals for grades over ten percent
   - ☑ ✓ The location of natural hazard areas on and within one hundred feet of the boundaries of the site, including:
     - ☐ Areas indicated on floodplain maps as being within the one hundred-year floodplain N/A
     - ☐ Geologic Hazards as defined in Section 17.44.020 N/A
     - ☐ Areas identified on the seismic conditions map in the comprehensive plan as subject to earthquake and seismic conditions N/A
   - ☑ ✓ The location of natural resource areas on and within one hundred feet of the boundaries of the site, including fish and wildlife habitat, natural areas, wooded areas, areas of significant trees or vegetation, and areas designated as being within the water resources overlay district N/A
   - ☑ ✓ The location of inventoried historic or cultural resources on and within one hundred feet of the boundaries of the site N/A
   - ☑ ✓ 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
   - ☑ ✓ The location, dimensions, square footage, building orientation and setback distances of proposed structure, improvements and utilities, and the proposed uses of the structures by square footage
   - ☑ ✓ 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
   - ☑ ✓ 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
   - ☑ ✓ All parking, circulation, loading and servicing areas, including the locations of all carpool, vanpool and bicycle parking spaces as required
   - ☑ ✓ Site access points for automobiles, pedestrians, bicycles and transit

- ☑ On-site pedestrian and bicycle circulation
- ☑ Outdoor common areas proposed as open space
- ☑ Total impervious surface created (including buildings and hard ground surfaces)

6. ✓ **Landscaping Plan**
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.

7. ✓ **Exterior Lighting Plan**
Drawn to scale, showing type, height, and area of illumination.

8. ✓ **Architectural Drawings**
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.

9. ✓ **Erosion and Sediment 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.

10. ✓ **Materials Board**
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.

11. ✓ **Pre-Application Conference Summary Sheet**

12. ✓ **Additional Information or Reports** *(If Required in Pre-Application Conference)*

13. ✓ **Summary of the Meeting with the Applicable Neighborhood Association**
(If Required in Chapter 17.50.050)

14. ✓ **Preliminary Storm Calculations** *(If Water Quality Detention is Required)*

15. ✓ **A Current Preliminary Title Report for the Subject Property(ies)**

16. ✓ **Mailing Labels for Owners Within 300 Feet of the Subject Site**
The names and addresses of property owners within 300 feet of the site indicated on the most recent property tax rolls.

17. ✓ **Copies** 3 copies, 3 full size sets of drawings, 1 11x17 set, 1 electronic
~~Twelve (12) copies of all information, reports, and drawings (full-sized and 8.5" by 11") pertaining to this application.~~

18. ✓ **Electronic Version of All Application Materials**

19. ✓ **All Required Application Fees**

Table of Contents

SUMMARY 6

SECTION 12.04 6

- **12.04.007 MODIFICATIONS:** 6
- **12.04.010 CONSTRUCTION SPECIFICATIONS—IMPROVED STREETS** 6
- **12.04.020 CONSTRUCTION SPECIFICATIONS—UNIMPROVED STREETS** 6
- **12.04.025 STREET DESIGN—DRIVEWAY CURB CUTS** 6
- **12.04.030 MAINTENANCE AND REPAIR** 6
- **12.04.032 REQUIRED SIDEWALK REPAIR** 7
- **12.04.033 CITY MAY DO WORK.** 7
- **12.04.034 ASSESSMENT OF COSTS.** 7
- **12.04.040 STREETS—ENFORCEMENT** 7
- **12.04.050 RETAINING WALLS—REQUIRED** 7
- **12.04.060 RETAINING WALLS—MAINTENANCE** 7
- **12.04.070 REMOVAL OF SLIDING DIRT.** 7
- **12.04.080 TO SECTION 12.04.110 EXCAVATIONS.** 7
- **12.04.120 TO SECTION 12.04.140 - OBSTRUCTIONS** 7
- **12.04.150 TO SECTION 12.04.160 STREET AND ALLEY VACATIONS.** 8
- **12.04.170 TO SECTION 12.04.175 STREET DESIGN** 8
- **12.04.180 STREET DESIGN** 9
- **12.04.185 STREET DESIGN—ACCESS CONTROL** 9
- **12.04.190 STREET DESIGN—ALIGNMENT** 10
- **12.04.194 TRAFFIC SIGHT OBSTRUCTIONS** 10
- **12.04.195 SPACING STANDARDS** 10
- **12.04.199 PEDESTRIAN AND BICYCLE ACCESSWAYS** 10
- **12.04.205 MOBILITY STANDARDS** 10
- **12.04.210 STREET DESIGN—INTERSECTION ANGLES.** 11
- **12.04.215 STREET DESIGN—OFF-SITE STREET IMPROVEMENTS** 11
- **12.04.220 STREET DESIGN—HALF STREET** 11
- **12.04.225 STREET DESIGN—CUL-DE-SACS AND DEAD-END STREETS** 11
- **12.04.230 STREET DESIGN—STREET NAMES** 11
- **12.04.235 STREET DESIGN—GRADES AND CURVES** 12
- **12.04.240 STREET DESIGN—DEVELOPMENT ABUTTING ARTERIAL OR COLLECTOR STREET** 12
- **12.04.245 STREET DESIGN—PEDESTRIAN AND BICYCLE SAFETY** 12
- **12.04.255 STREET DESIGN—ALLEYS** 12
- **12.04.265 STREET DESIGN—PLANTER STRIPS** 12
- **12.04.270 STANDARD CONSTRUCTION SPECIFICATIONS** 12
- **12.04.280 VIOLATION—PENALTY** 12

SECTION 12.08 – STREET TREES 13

- **12.08.015 Street tree planting and maintenance requirements** **13**
- **12.08.020 Street tree species selection** **13**
- **12.08.025 General tree maintenance** **13**
- **12.08.030 Public property tree maintenance** **13**
- **12.08.035 Public tree removal** **13**
- **12.08.040 Heritage Trees and Groves** **13**
- **12.08.045 Gifts and funding** **14**
- **12.08.050 Violation—Penalty.** **14**

13.08 SEWER REGULATIONS **14**

- **13.08.010 Sewer connections—Required** **14**
- **13.08.020 Connection required—Notice** **14**
- **13.08.030 Privies** **14**
- **13.08.040 Engineer—Approval required** **14**
- **13.08.050 Engineer—Permits.** **14**
- **13.08.060 Bond required** **14**
- **13.08.070 Acceptance of connection by city** **14**
- **13.08.080 Notification of engineer** **15**
- **13.08.090 Connections to existing work** **15**
- **13.08.100 Barriers** **15**
- **13.08.110 Condition of fixtures** **15**
- **13.08.120 Permit revocation** **15**
- **13.08.130 Development and user charges** **15**
- **13.08.140 Applications outside city limits.** **15**
- **13.08.150 Permit issuance—Connection supervision** **15**
- **13.08.160 Entry in lien record** **15**
- **13.08.170 Private connections prohibited** **16**
- **13.08.180 Unlawful substances** **16**
- **13.08.190 Sanitary requirements** **16**
- **13.08.200 Collection** **16**
- **13.08.210 STEP systems** **16**
- **13.08.220 Violation—Penalty** **16**
- **13.08.230 Standard construction specifications** **16**

SECTION 13.12 – STORM WATER MANAGEMENT **16**

- **13.12.010 Purpose** **16**
- **13.12.020 Adoption of standards** **16**
- **13.12.030 Superceding Oregon City Drainage Master Plan Appendix A** **17**
- **13.12.040 Definitions** **17**
- **13.12.050 Applicability and exemptions** **17**
- **13.12.060 Abrogation and greater restrictions** **18**
- **13.12.070 Severability** **19**
- **13.12.080 Submittal requirements** **19**
- **13.12.090 Approval criteria for engineered drainage plans and drainage report** **19**
- **13.12.100 Alternative materials, alternative design and methods of construction** **22**
- **13.12.110 Transfer of engineering responsibility** **22**

- 13.12.120 Standard Construction Specifications 22
- 13.12.130 Administrative provisions 22
- 13.12.140 Maintenance of public stormwater facilities 22
- 13.12.150 Penalties and enforcement 22
- 13.12.160 Hazardous conditions 22
- 13.12.170 Permits from other jurisdictions 23
- 13.12.180 Violation—Penalty 23

17.29 – MUC – MIXED USE CORRIDOR DISTRICT 23

- 17.29.010 Designated 23
- 17.29.020 Permitted uses—MUC-1 and MUC-2 23
- 17.29.030 Conditional uses—MUC-1 and MUC-2 zones 23
- 17.29.040 Prohibited uses in the MUC-1 and MUC-2 zones 23
- 17.29.050 Dimensional standards—MUC-1 23
- 17.29.060 Dimensional standards—MUC-2 24
- 17.29.070 Floor area ratio (FAR) 24

17.41 TREE PROTECTION STANDARDS 24

- 17.41.010 Protection of trees—Intent 24
- 17.41.020 Tree protection—Applicability 24
- 17.41.030 Tree protection—Conflicting code provisions 25
- 17.41.040 Same—Exemptions 25
- 17.41.050 Same—Compliance options 25
- 17.41.060 Tree removal and replanting—Mitigation (Option 1) 25
- 17.41.060 Tree removal and replanting—Mitigation (Option 1) 25
- 17.41.075 Alternative mitigation plan 25
- 17.41.080 to Section 17.41.125 25
- 17.41.130 Regulated tree protection procedures during construction. 26

17.47 – EROSION AND SEDIMENT CONTROL 26

- 17.47.010 Purpose 26
- 17.47.030 Applicability 26
- 17.47.040 Abrogation and greater restrictions 26
- 17.47.050 Severability 26
- 17.47.060 Permit required 26
- 17.47.070 Erosion and sediment control plans 27
- 17.47.080 Plan implementation 27
- 17.47.090 Plan performance guarantee and security 27
- 17.47.100 Correction of ineffective measures and enforcement 27

17.50 – ADMINISTRATION AND PROCEDURES 27

- 17.50.010 Purpose 27
- 17.50.030 Summary of the city's decision-making processes 28
- 17.50.040 Development review in overlay districts and for erosion control 28
- 17.50.050 Preapplication conference 28
- 17.50.055 Neighborhood association meeting 28

- **17.50.060 Application requirements** 28
- **17.50.070 Completeness review and one hundred twenty-day rule** 28
- **17.50.080 Complete application—Required information** 29
- **17.50.090 Public notices** 29
- **7.50.100 Notice posting requirements** 29
- **17.50.110 Assignment of decision-makers** 29
- **17.50.120 Quasi-judicial hearing process** 29
- **17.50.130 Conditions of approval and notice of decision** 29
- **17.50.140 Performance guarantees** 29
- **17.50.150 Covenant with the city** 29
- **17.50.160 Ex parte contact, conflict of interest and bias** 30
- **17.50.170 Legislative hearing process** 30
- **17.50.180 Objections to procedure** 30
- **17.50.190 Appeals** 30

17.50.200 Expiration of an approval 30
17.50.210 Extension of an approval 30
17.50.220 Reapplication limited 30
17.50.230 Interpretation 30
17.50.240 Conformity of permits 30
17.50.260 Reconsideration of a final decision 31
17.50.270 Revocation of a previously approved permit 31
17.50.280 Transfer of approval rights 31
17.50.290 Fees 31

17.52 – OFF-STREET PARKING AND LOADING 31

- **17.52.010 Applicability** 31
- **17.52.15 Planning commission adjustment of parking standards** 31
- **17.52.020 Number of automobile spaces required** 31
- **17.52.030 Standards for automobile parking** 32
- **17.52.040 Bicycle parking standards** 32
- **17.52.060 Parking lot landscaping** 33
- **17.52.070 Alternative landscaping plan** 33
- **17.52.080 Maintenance** 33
- **17.52.090 Loading areas** 33

17.54 – SUPPLEMENTAL ZONING REGULATIONS AND EXCEPTIONS 33

- **17.54.010 Accessory buildings and uses** 33
- **17.54.020 Projections from buildings** 34
- **17.54.030 Setback exceptions** 34
- **17.54.060 Seasonal sales** 34
- **17.54.090 Accessory dwelling units** 34
- **17.54.100 Fences** 34
- **17.54.105 Live/work units** 34

17.62 – SITE PLAN AND DESIGN REVIEW 35

- **17.62.050 Standards** 35
- **17.62.055 Institutional and commercial building standards** 41

- **17.62.057 MULTIFAMILY STANDARDS** **41**
- **17.62.065 OUTDOOR LIGHTING** **46**
- **17.62.080 SPECIAL DEVELOPMENT STANDARDS ALONG TRANSIT STREETS** **46**
- **17.62.085 REFUSE AND RECYCLING STANDARDS** **46**

17.65 – MASTER PLANS **46**

SUMMARY

This Site Plan and Design Review Application code review narrative is provided per the request of Oregon City as stated in the pre-application meeting notes under “Additional Code Sections”. This sectionalso includes narratives requested for other specifically called out sections in the pre-application meeting notes. Other individual narratives or studies for the Site Plan and Design Review Application may apply to the complete application package and are called out where applicable.

The proposed project is a combination of 121 rental apartments and 62 rental live-work units that form a village concept. The site is a cornerstone for possible future expansion of currently un-zoned land around it. This un-zoned land is in the Beavercreek Road Concept Plan area currently under consideration for approval by Oregon City. Our proposed community’s mix of live-work ground floor commercial and regular apartments provides opportunities for meeting the base zoning of the site while also meeting the intent of the un-adopted Beavercreek Road Concept Plan.

SECTION 12.04

- ### 12.04.007 Modifications:

  Where design modifications are requested the applicant has called them out in the appropriate section.

- ### 12.04.010 Construction specifications—Improved streets

  Improved sidewalks along city streets on the plan are designed to city standards

- ### 12.04.020 Construction specifications—Unimproved streets

  N/A - No unimproved streets exist on the submitted plan.

- ### 12.04.025 Street design—Driveway curb cuts

  Driveway curb cuts meet the design standards of the multi-family residential driveway access standards. There is only one driveway access point per frontage off of any existing or proposed public road. These driveways meet the width standards called out in the guidelines of 15 feet minimum and 40 feet maximum.

- ### 12.04.030 Maintenance and repair

  The applicant acknowledges this section and agrees the owner shall maintain and repair the sidewalks.

- **12.04.032 Required sidewalk repair**

  The applicant acknowledges this section.

- **12.04.033 City may do work.**

  The applicant acknowledges this section.

- **12.04.034 Assessment of costs.**

  The applicant acknowledges this section.

- **12.04.040 Streets—Enforcement**

  The applicant acknowledges this section.

- **12.04.050 Retaining walls—Required**

  Retaining walls required to meet the grading concepts of the plan are called out on the grading plans submitted with the application.

- **12.04.060 Retaining walls—Maintenance**

  The applicant acknowledges this section.

- **12.04.070 Removal of sliding dirt.**

  The applicant acknowledges this section.

- **12.04.080 to section 12.04.110 Excavations.**

  The applicant acknowledges these sections.

- **12.04.120 to section 12.04.140 - Obstructions**

  The applicant acknowledges these sections and has not plans to Obstruct the roadways, alleyways or sidewalks once construction of the proposed project is complete.

- **12.04.150 to section 12.04.160 Street and alley vacations.**

  No street or alley vacations are proposed for this permit and plan.

- **12.04.170 to section 12.04.175 Street design**

  Located in the center of the 453 acre area whose future has been carefully studied in the Beavercreek Road Concept Plan any decisions made by the site plan proposed with this application will have multiple ramifications on the future developments for years to come. One of the largest impacts on the future development of the area will be the framework in which they have to plug in to; the largest factor of the framework is of course the street network. The most critical step was determining the number of through-streets to parallel Beavercreek Road between Beavercreek and the planned Central Parkway which would ultimately define block size and developable land areas. We focused on the Oregon City Municipal Code and Beavercreek Road Concept Plan for direction as well as investigating block sizing at a local, state and national level.

  Considering the givens we have to work with, Beavercreek Road as an Arterial Street and Meyers Road as a Collector Street, the first major factor was the minimum street intersection spacing standards outlined in OCMC Chapter 12.04.195. As found in Table 12.04.040 no Local Street or Neighborhood Collector (depending on how the new parallel road will be classified) shall be within 300 feet as measured along Meyers Road. Using this piece of information coupled with an effort to standardize the grid system made the direction rather clear that one parallel road would be the most logical path. With one block dimension defined, further analysis of block sizing was then completed to help inform how many perpendicular cross streets to plan between Meyers Road and Glen Oak Road.

  There is of course a wide range in block sizes as you sample major metropolitan areas across the country; from one of the largest at 1000'x500' in New York to some of the smallest right here in Portland at only 200'x200'. Delving further into how different block sizes function and the feel they lend to the pedestrian environment is quite informative; and by filtering this information by the types of use and other site specific design parameters we can zero in on an effective range to best suit the goals of the Concept Plan.

  After analyzing this information and applying it to our site plan we feel confident that the 340'x440' block size we have proposed provides the needed balance between maximizing pedestrian circulation routes and net developable land areas. The rationale behind a 340'x440' block size is the consistent grid spacing and the flexibility it will lend to the different development zones within the Beavercreek Road Concept Plan. In areas such as the mixed employment zone it is just large enough to allow the buildings to face onto the streets with the use of alleys and interior parking where a smaller block size would limit our ability to meet this code requirement. As the grid extends north to the North Employment Campus it will lend itself to larger building footprints for commercial and business tenants. Connecting to the South in the Main Street and Mixed Use Neighborhoods the same concept as the MEV could be used (building street frontage with interior alleyways and parking concept) with the option to introduce additional local streets creating half-blocks at 220'x340' for the most pedestrian dense shopping districts.

As the timeline for future developments is unknown, the new internal public streets would be dead-end stubs with temporary turn-arounds and signage indicating future extension. The site itself would be linked to the existing transportation network by extending Meyers Road to the North across Beavercreek Road into/through the property. As determined by a traffic impact analysis, one lane aligned with the existing northbound lane will be provided for site ingress with 2 lanes provided for egress at the intersection. All stub roads and site topography are deigned to meet existing grade at the property lines as closely as possible to ensure smooth transition for future developments.

- **12.04.180 Street design**

The new roads proposed within the site fall into two classification categories per Table 12.04.180. The Meyers Road extension is classified as a "Collector" while the internal public streets fall into the "Local" street classification.

Per the "Collector" standards the right of way provided for the Meyers Road extension into what the comprehensive plan identifies as a mixed-use, commercial or public/quasi-public area is 86 feet in width with a pavement width of 64 feet. Three 12 foot travel lanes are provided at the intersection in addition to bike lanes, sidewalk, landscape strip and street parking.

The only variation from the strict interpretation of the table is the proposed sidewalk and landscape strip design we propose for Meyers Road. As noted in Section 12.04.180 the standards provided in table 12.04.180 are the maximum design standards; the deviation we propose is to follow the landscape strip and sidewalk requirements for a collector classified road but the industrial/residential standard of a 5 foot walk with 7.5 foot landscape strip. This modification conforms to the intent of the standards by providing safe and efficient movement of pedestrians, motor vehicles, bicyclists and freight in addition to being complimentary to the surrounding street design in character and scale.

The new internal streets, Street A and Street B, would be dedicated as public roads and would be classified as "Local" streets. Following the standards in the table for the Mixed-use, commercial or public/quasi-public designation the right of way provided for the new internal streets is 62 feet in width. The proposed plan for bicycle and pedestrian access are again a slight deviation from the strict application of the table by utilizing the standards for local road classification but instead the plan designation type of industrial or residential. This option goes above the standards of the Mixed-use, commercial or public/quasi-public designation by providing bike lanes where none are required.

Within the newly created blocks are alley loops that serve the parking areas. The width of the proposed alleys is 24 feet to accommodate 90 degree parking on both sides and would have a right-of-way designated with the same width.

- **12.04.185 Street design—Access control**

The dead end conditions proposed at the north property boundary of the Meyers Road extension and new public street A and Street B at the east property boundary shall have access control granted to the

city per this section. The access control restrictions shall exist until the neighboring properties are developed and the streets are extended to the adjacent properties.

- **12.04.190 Street design—Alignment**

The planned Meyers Road extension across Beavercreek Road is aligned with the centerline of the existing roadway.

- **12.04.194 Traffic sight obstructions**

The site plan and landscape planting plan have been designed to exclude vegetation and built elements exceeding three feet in height within the clear vision area as defined by Section 10.32.020. Required street trees planted along Meyers and Beavercreek Roads will have all branches and foliage removed to a height of eight feet above the grade.

- **12.04.195 Spacing standards**

The Meyers Road extension is classified as a Collector Street with a minimum distance of 100 feet from a street corner to a driveway and between driveways. The dimension from the edge of the Beavercreek Road right of way to the nearest portion of the parking lot driveway access on the north side of the Meyers Road extension is 185 feet; complying with Table 12.04.195.B.

The distance from the intersection of new Local Street A with the Meyers Road extension to the nearest portion of the alley access to the north of building A2 is 58 feet; complying with the 25 foot minimum for local street distances from Table 12.04.195.B.

The intersections listed above represent the shortest distance cases; all other intersections/distances exceed these minimums and are compliant with the standards set forth in Table 12.04.195.B.

- **12.04.199 Pedestrian and bicycle accessways**

Per the definition provided in this section, Pedestrian/bicycle access ways are intended to provide direct, safe and convenient connections where public street connections for automobiles, bicycles and pedestrians are unavailable or where the public street option is unavailable, impractical or inappropriate. As previously covered under the discussion for Section 12.04.170 through 12.04.175 the proposed site plan street grid provides both bike lanes and safe pedestrian ways on both sides of all proposed public streets. The site plan as proposed provides both practical and direct access for both cyclists and pedestrians throughout the site under the three hundred thirty foot interval standard therefore no additional access ways are required or planned for the site.

- **12.04.205 Mobility standards**

See the Transportation Impact Analysis performed for the proposed project submitted as part of this Site Plan and Design Review application.

- **12.04.210 Street design—Intersection angles.**

The Meyers Road extension is planned to be aligned with the centerline of the existing section of road on the south side of Beavercreek Road. The new segment of road is planned to shift 10.5 degrees north beginning at the centerline of Beavercreek Road. The Meyers Road extension to the north will therefore create a 79.5 degree angle at the intersection with Beavercreek Road. The factor that lead to this alignment was the decision to maintain the existing centerline of Meyers Road through the intersection and its interaction with the existing gas line easement to the north of Meyers (at an angle of 77.5 degrees to Beavercreek Road). The intersection angle as shown was necessary in order to accommodate the street alignment and 86 foot road right of way width while avoiding any interference with the existing easement.

All other proposed intersections occur at 90 degree angles and include more than the minimum tangent adjacent to the intersections. Intersection corners are designed with a 28 foot radius (three feet over minimum) to accommodate the turning radius of common fire department equipment.

- **12.04.215 Street design—Off-site street improvements**

Street design improvements along Beavercreek Road are per the concepts asked for in the Beavercreek Road Concept Plan.

- **12.04.220 Street design—Half street**

N/A – The proposed project has no half streets.

- **12.04.225 Street design—Cul-de-sacs and dead-end streets**

The dead-end streets shown on the plan are not permanent dead-end streets. They are designed to be connected to future developments on adjacent parcels at an undetermined time in the future. These temporary dead-end streets are designed with areas that allow for turn around which could be converted to parallel parking spaces once the project's proposed street network is connected to future developments.

- **12.04.230 Street design—Street names**

The applicant will name the two new public cross streets at a later time. Those names will comply with the standards of this section.

- **12.04.235 Street design—Grades and curves**

  All grades and curves on the proposed plan meet the design standards of the City.

- **12.04.240 Street design—Development abutting arterial or collector street**

  The proposed site plan includes live/work residential units abutting an existing arterial street (Beavercreek Road) which are governed by Section 17.54.105 as well as the MUC-1 zoning classification of the site and the associated dimensional standards in Section 17.29.050. The improvements along the north side of Beavercreek will include at a minimum a curb and gutter, an eight foot parking lane, an 8 foot storm drainage swale with street trees and a six foot sidewalk as indicated in Engineering-utilities notes issues with the Pre-application meeting notes dated July 5th, 2013. No further additional requirements have been requested or made required beyond the measures listed above by the decision maker.

- **12.04.245 Street design—Pedestrian and bicycle safety**

  The proposed street designs adequately address pedestrian and bicycle safety by utilizing traffic calming elements such as parallel street parking and marked pedestrian crossings. The decision maker reserves the right to make further comments on the proposed designs.

- **12.04.255 Street design—Alleys**

  Access to private off-street parking and loading facilities are adequately provided for per the driveway design standards. The street network called for in this plan meets the design intent of the Beavercreek Road Concept Plan and does not interfere with the pedestrian experience requested by the MUC-1 zone.

- **12.04.265 Street design—Planter strips**

  All proposed new public streets on the site plan include a minimum five foot wide planting strip adjacent to the curb within the right of way. The tree species have been selected and shall be planted in accordance with Chapter 12.08 to promote and maintain the community tree canopy adjacent to public streets.

- **12.04.270 Standard construction specifications**

  The applicant acknowledges this section and will follow it.

- **12.04.280 Violation—Penalty**

The applicant acknowledges this section.

SECTION 12.08 – STREET TREES

- ### 12.08.015 Street tree planting and maintenance requirements

Along Beavercreek Road, the streetscape has been enhanced with 2 in. caliper Zelkova serrata "Halka spaced approximately every 40 feet. Within the main interior road, Meyers Rd, 3.5 in. caliper Crategus laevigata "Crimson Cloud" trees have been planted approximately every 30 feet.

Interior streetscape trees include 2in. caliper Carpinus getulus 'Fastigiata' planted 30 feet on center, 2in. caliper Pyrus calleryana 'Glen's Form' TM planted every 30 feet on center, and Zelkova serrata "Halka Zel will be planted at interior intersections.

All trees will be irrigated and will require minimal maintenance other than yearly inspection for disease.

- ### 12.08.020 Street tree species selection

No conditions are present that would require the director to specify the species of trees required to be planted.

- ### 12.08.025 General tree maintenance

The applicant acknowledges this section.

- ### 12.08.030 Public property tree maintenance

The applicant acknowledges this section.

- ### 12.08.035 Public tree removal

N/A – No public trees are being removed as part of the applicant's plan.

- ### 12.08.040 Heritage Trees and Groves

N/A - The applicant's submitted application does not consider removal of any Heritatge Trees, as detailed in the Arborist's report.

- **12.08.045 Gifts and funding**

  The applicant acknowledges this section.

- **12.08.050 Violation—Penalty.**

  The applicant acknowledges this section.

13.08 SEWER REGULATIONS

- **13.08.010 Sewer connections—Required**

  The proposed project will be connected to the public sewer system as shown on the plans.

- **13.08.020 Connection required—Notice**

  The applicant acknowledges this section.

- **13.08.030 Privies**

  The applicant has no plans to connect to any systems mentioned in this section. Any septic system that might exist from the original house located on the parcel where the applicant is proposing the project would be properly decommissioned and removed during construction of the new systems.

- **13.08.040 Engineer—Approval required**

  The applicant acknowledges this section and will comply with it.

- **13.08.050 Engineer—Permits.**

  The applicant acknowledges this section and will comply with it.

- **13.08.060 Bond required**

  The applicant acknowledges this section and will comply with it.

- **13.08.070 Acceptance of connection by city**

The applicant acknowledges this section and will comply with it.

- **13.08.080 Notification of engineer**

The applicant acknowledges this section and will comply with it.

- **13.08.090 Connections to existing work**

The applicant acknowledges this section and will comply with it.

- **13.08.100 Barriers**

The applicant acknowledges this section and will comply with it.

- **13.08.110 Condition of fixtures**

N/A – The proposed project is not carrying off animal refuse.

- **13.08.120 Permit revocation**

The applicant acknowledges this section.

- **13.08.130 Development and user charges**

The applicant acknowledges this section.

- **13.08.140 Applications outside city limits.**

N/A – The applicant's project is not outside of city limits.

- **13.08.150 Permit issuance—Connection supervision**

The applicant acknowledges this section and will comply with it.

- **13.08.160 Entry in lien record**

The applicant acknowledges this section.

- **13.08.170 Private connections prohibited**

  The applicant acknowledges this section and will comply with it.

- **13.08.180 Unlawful substances**

  The applicant acknowledges this section.

- **13.08.190 Sanitary requirements**

  N/A – The applicant is not proposing any factories or workshops.

- **13.08.200 Collection**

  The applicant acknowledges this section.

- **13.08.210 STEP systems**

  N/A – The applicant is not proposing any STEP systems.

- **13.08.220 Violation—Penalty**

  The applicant acknowledges this section.

- **13.08.230 Standard construction specifications**

  The applicant acknowledges this section and will comply with it.

SECTION 13.12 – STORM WATER MANAGEMENT

- **13.12.010 Purpose**

  The applicant acknowledges this section and has designed a storm water management system that meets the minimum standards and requirements of this section. These include provisions for mitigating the potential impacts to pre developed hydrologic conditions including increases in runoff flow intensities and impacts to stormwater runoff quality.

- **13.12.020 Adoption of standards**

The applicant acknowledges this section.

- ## 13.12.030 Superceding Oregon City Drainage Master Plan Appendix A

The applicant acknowledges this section.

- ## 13.12.040 Definitions

The applicant acknowledges this section.

- ## 13.12.050 Applicability and exemptions

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;
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.

APPLICANT RESPONSE TO SECTION*: The proposed project is subject to applicable city stormwater conveyance requirements. Please refer to the stormwater report that is included in this application for additional information.*

B. Stormwater Quantity Control. The stormwater quantity control requirements of this chapter shall apply to the following proposed activities, uses or developments:
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 seven-year period;
2. Activities that create more than two thousand square feet of impervious surface, cumulated over any given seven year period; or
3. Redevelopment of a commercial or industrial land use that will disturb more than five thousand square feet of existing impervious surface. This five thousand square foot measurement cumulates over any given seven year period;
4. An exemption to the stormwater quantity control requirements of this chapter will be granted in the following circumstances:
a. The development site discharges to a stormwater quantity control facility approved by the city engineer to receive the developed site runoff after verification that the facility is adequately sized to receive the additional stormwater, or,

b. The development site discharges to one of the following receiving bodies of water: 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

***APPLICANT RESPONSE**: The proposed project is subject to applicable city stormwater quality control requirements. Please refer to the stormwater report that is included in this application for additional information.*

C. Stormwater Quality Control. The stormwater quality control requirements of this chapter shall apply to the following proposed activities, uses or developments:
1. Category A. Activities subject to general water quality requirements of this chapter:
a. The construction of four or more single-family residences;
b. 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 seven year period; or
c. Activities that create more than eight thousand square feet of new impervious surface for other than a single-family residential development. This eight thousand square foot measurement will be considered cumulative for any given seven year period;
d. An exemption to the stormwater quantity control requirements of this subsection will be granted if the development site discharges to a stormwater quality control facility approved by the city engineer to receive the developed site runoff after verification that the facility is adequately sized to receive the additional stormwater.
2. Category B. 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 contained in the Public Works Stormwater and Grading Design Standards:
a. Fuel dispensing facilities;
b. Bulk petroleum storage in multiple stationary tanks;
c. Solid waste storage areas for commercial, industrial or multi-family uses;
d. Loading and unloading docks for commercial or industrial uses; or
e. Covered vehicle parking for commercial or industrial uses.
3. Category C. Clackamas River Watershed. In addition to any other applicable requirements of this chapter, any development that creates new waste discharges and whose stormwater runoff may directly or indirectly flow into the Clackamas River is subject to additional requirements associated with Oregon Administrative Rules (OAR) 340-41-470 (Thee Basin Rule).

***APPLICANT RESPONSE**: The proposed project is subject to applicable city stormwater quality control requirements. Please refer to the stormwater report that is included in this application for additional information.*

- **13.12.060 Abrogation and greater restrictions**

The applicant acknowledges this section.

- ## 13.12.070 Severability

The applicant acknowledges this section.

- ## 13.12.080 Submittal requirements

A. Timing and Scope of Required Submittal.
1. Applications subject to the stormwater conveyance requirements of this chapter shall include an engineered drainage plan and design flow calculation report submitted prior to, or contemporaneous with, submittal of an application for a building, land use or other city issued permit.
2. Applications subject to the stormwater quantity and/or Category A quality requirements of this chapter shall include an engineered drainage plan and an engineered drainage report submitted prior to, or contemporaneous with, submittal of an application for a building, land use or other city issued permit.
3. Applications subject to Category B water quality special management practices shall demonstrate compliance with the additional management practices for commercial, industrial and multi-unit dwelling land uses of the Public Works Stormwater and Grading Design Standards as part of the site plan and design review process.
4. Applications subject to Category C water quality requirements for the Clackamas River Watershed are subject to OAR 340-41-470 (Three Basin Rule). No new discharges will be approved until a copy of a current DEQ permit, or written statement from DEQ that none is required, is on file with the city.
B. Required engineered drainage plans, drainage reports, and design flow calculation reports, which contain methods and proposed facilities to manage stormwater conveyance, quantity and/or quality, shall be prepared in compliance with the submittal requirements of the Public Works Stormwater and Grading Design Standards.
C. 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.

APPLICANT RESPONSE: *The preliminary stormwater report is submitted along with the preliminary plans in accordance with the Oregon City Municipal Code (OCMC). Additional details are described in the stormwater report.*

- ## 13.12.090 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 management facilities will accomplish the purpose statements of this chapter;

APPLICANT RESPONSE: *The purpose statements found in Section 13.12.010 discuss minimizing increases to stormwater runoff, preventing runoff from exceeding downstream capacities, preventing irresponsible discharge of stormwater onto adjacent property, etc. These purpose criteria are reflected in the approval criteria found in this section. As shown on the preliminary utility plan, on-site stormwater is collected and conveyed to a private stormwater facility.*

Stormwater is detained and treated in the stormwater detention facility and then discharged to a culvert located in Beavercreek Rd, which discharges to the existing roadside ditch in Beavercreek road that drains in a northwest direction.

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.

APPLICANT RESPONSE: *The preliminary stormwater report and plans provided with this application meet the requirements of the Public Works Stormwater and Grading standards adopted under Section 13.12.020.*

C. Unless otherwise exempted by Section 13.12.050(B), the plan and report includes adequate stormwater quantity control facilities, so that when the proposed land development activity takes place, peak rates and volumes of runoff:
    1. Do not exceed the capacity of receiving drainage conveyance facilities;

APPLICANT RESPONSE*: The preliminary stormwater report demonstrates that the proposed project does not exceed the capacity of receiving drainage conveyance facilities. This is accomplished with the proposed stormwater facility that includes detention.*

    2. Do not increase the potential for streambank erosion; and

APPLICANT RESPONSE*: The property discharges into a roadside ditch and flows for approximately 1900 feet north along the east edge of Beavercreek Rd. At the Beavercreek Rd/ Loder Rd intersection the ditch flow enters a culvert under Loder Rd and then drains towards the west under Beavercreek Rd where it ultimately contributes to a natural creek approximately 800 ft west of Beavercreek Rd. This discharge point is substantially distant (approximately 2700 feet) from the proposed development. Potential impacts due to an increase in peak stormwater flow rates will be modulated well before it discharges to this creek. The preliminary stormwater report demonstrates that the potential for streambank erosion is not increased. This is achieved by stormwater detention and protecting outfall locations.*

    3. Do not add volume to an off-site closed depression without providing for mitigation.

APPLICANT RESPONSE*: Volume is not added to an off-site closed depression. Therefore, the application satisfies this criterion.*

D. Unless otherwise exempted by Section 13.12.050(C), the proposed development includes:
    1. Adequate stormwater quality control facilities, so that when the proposed land development activity takes place, the temperature and overall pollution level of stormwater runoff is no greater than the water entering. When no water enters a project, then stormwater runoff shall be compared to rain samples; and

APPLICANT RESPONSE*: As illustrated in the preliminary plans and discussed in the preliminary stormwater report, the proposed project includes an adequately sized stormwater quality facility.*

2. Stormwater quality control facilities which:
a. Are in compliance with applicable National Pollutant Discharge Elimination System (NPDES) requirements;

APPLICANT RESPONSE: *An NPDES 1200-C Permit will be obtained prior to construction because the existing ground disturbance will exceed 1 acre. Proper erosion control measures will be provided to ensure erosion or siltation off of the site will not occur.*

b. Minimize the deterioration of existing watercourses, culverts, bridges, dams and other structures; and

APPLICANT RESPONSE*: As illustrated in the preliminary plans and discussed in the preliminary stormwater report, the proposed project is designed to minimize the deterioration of existing watercourses, culverts, bridges, dams, and other structures. This is achieved through stormwater quality, detention, and outfall protection.*

c. Minimize any increase in nonpoint source pollution.

APPLICANT RESPONSE: *As shown on the preliminary stormwater plans and discussed within the preliminary stormwater report, the public stormwater facilities incorporated within the project will minimize the increases in nonpoint source pollution in accordance with city requirements.*

E. 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.

APPLICANT RESPONSE: *As shown in the preliminary stormwater plan and discussed in the preliminary stormwater report, the proposed project's stormwater will be collected within storm water system components including curb inlets, and storm laterals prior to being conveyed to the on-site stormwater facility. The project is located at the upper elevation of its containing watershed – no upstream stormwater system extensions are anticipated.*

F. Streambank erosion protection is provided where stormwater, directly or indirectly, discharges to open channels or streams. The post development peak stormwater discharge rate from a development site for the two year, twenty-four hour duration storm event shall not exceed fifty percent of the two year, twenty-four hour predevelopment peak runoff rate.

APPLICANT RESPONSE*: There is no stream bank located in proximity to the subject property. There is a stormwater facility proposed on site, and outfall protection is proposed. Stream bank erosion is not anticipated as a result of the proposed project see 13.12.090. C.2. above.*

G. Specific operation and maintenance measures are proposed that ensure that the proposed stormwater quantity control facilities will be properly operated and maintained.

APPLICANT RESPONSE: *As shown on the preliminary stormwater plans and detailed within the preliminary stormwater report, specific operation and maintenance measures are proposed, that when*

followed, will ensure that the proposed stormwater control facilities will be properly operated and maintained for continued effectiveness.

- **13.12.100 Alternative materials, alternative design and methods of construction**

None at this time.

- **13.12.110 Transfer of engineering responsibility**

The applicant acknowledges this section and will comply by providing written notice to the City per the standards outlined in this section.

- **13.12.120 Standard Construction Specifications**

Not applicable for the Site Plan and Design Review Application.

All construction of public facilities will be in accordance with the most recent addition of the Oregon chapter APWA Standard Specifications for public works construction as adopted and modified by the city of Oregon City.

- **13.12.130 Administrative provisions**

Not applicable for the Site Plan and Design Review Application.

- **13.12.140 Maintenance of public stormwater facilities**

The applicant acknowledges this section. It is not necessary for the Site Plan and Design Review Application but will become relevant during the construction of the project. The applicant will follow these procedures provided they are still in place at the time of the construction.

- **13.12.150 Penalties and enforcement**

The applicant acknowledges this section.

- **13.12.160 Hazardous conditions**

The applicant acknowledges this section.

- **13.12.170 Permits from other jurisdictions**

  All permits from other jurisdictions necessary for the approval of the permitting and construction of the project will be obtained. At the time of submittal of this application it is anticipated that the applicant will eventually require the following permits for construction: DEQ 1200C permit. Clackamas County Construction Permit for Beavercreek Road.

- **13.12.180 Violation—Penalty**

  The applicant acknowledges this section.

17.29 – MUC – Mixed Use Corridor District

- **17.29.010 Designated**

  The proposed development is located in an MUC-1 zone along Beavercreek Road. The proposed project will contain a mix of multi-family residential and live-work uses.

- **17.29.020 Permitted uses—MUC-1 and MUC-2**

  The proposed development is allowed under sub-section N of this section, Residential Units, multi-family. Any of the live-work uses will conform with the uses permitted in this section. The section of this application describing live-work businesses will better elaborate on the types of businesses that may operate in the live-work spaces.

- **17.29.030 Conditional uses—MUC-1 and MUC-2 zones**

  None of the uses in this section are currently envisioned for the development and are not part of this application.

- **17.29.040 Prohibited uses in the MUC-1 and MUC-2 zones**

  None of the uses in this section will be allowed in the live-work portions of the proposed development.

- **17.29.050 Dimensional standards—MUC-1**

  The maximum building height is defined by Section 17.04.550 as:

> ""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."

The proposed building elevations range from 37 feet to 39 feet from average finished grade to the midpoint of the roof.

The surrounding properties have no current zoning designation and therefore there is no minimum setback required per 17.29.050.C

The distance from the edge of the Beavercreek Road right of way to the buildings is 7'-3". Per Section 17.62.055.D one additional measure will be provided to allow a maximum front yard setback of ten feet; the standard maximum of 5 feet per 17.29.050.E.1 plus one five foot increase. Pedestrian scale lighting has been selected from Section 17.62.055.D to qualify for the five foot increase.

The lot coverage of the proposed site plan is approximately 64% with the landscaped area to exceed the minimum 20% requirement.

- ### 17.29.060 Dimensional standards—MUC-2

Not applicable as we are not in the MUC-2 zone.

- ### 17.29.070 Floor area ratio (FAR)

The project is in an MUC-1 zone and section 17.29.050 does not contain floor area ratio specifications, only dimensional standards, which the project meets.

17.41 Tree Protection Standards

- ### 17.41.010 Protection of trees—Intent

The applicant acknowledges the intent of this section of code to preserve as many existing trees as possible. As part of our application a tree survey is submitted discussing existing trees on the property. It is not feasible to design the project without removing the existing trees. The application planting plan shows that all the trees which have to be removed have been replaced per code by the required multiplier of new trees. This amount of new tree planting is also discussed in the tree survey.

- ### 17.41.020 Tree protection—Applicability

The applicant acknowledges that it must comply with the standards of this section since it is going through a Type II Site Plan and Design Review process.

- **17.41.030 Tree protection—Conflicting code provisions**

  The applicant acknowledges this section.

- **17.41.040 Same—Exemptions**

  This section does not apply to us as we are proposing a new development and not maintenance or pruning of existing trees in a private existing development or farm.

- **17.41.050 Same—Compliance options**

  The applicant is choosing to use Option number 1, mitigation.

- **17.41.060 Tree removal and replanting—Mitigation (Option 1)**

  The applicant has submitted a tree survey including a mitigation plan and report from a certified arborist that outlines the number of trees to be mitigated and the number of trees that will be planted.

- **17.41.060 Tree removal and replanting—Mitigation (Option 1)**

  Our plan is to utilize Choice A and re-plant on our site.

  Pursuant to the project Arborist report (15) trees are to be removed all of which are located within the construction area; (9) trees are recommended for removal for the purpose of construction and (6) are recommended for removal because of poor or hazardous conditions. In accordance with this report (20) are required for mitigation. The proposed landscape plan for the project includes the placement of (237) trees on the property which will exceed this requirement.

- **17.41.075 Alternative mitigation plan**

  The applicant is not utilizing this section.

- **17.41.080 to Section 17.41.125**

  These sections are not applicable. The applicant is not utilizing the Options that these sections of code apply to. The applicant is utilizing Option 1.

- **17.41.130 Regulated tree protection procedures during construction.**

  No trees will be removed that are not shown for removal and mitigation per the enclosed Tree Survey and final approved Site Plan and Design Review permit, without prior written authorization from the Planning Director.

  The applicant's plan includes removing all the standing trees currently on the site so sub-sections B and C of this section of code do not apply.

17.47 – Erosion and Sediment Control

- **17.47.010 Purpose**

  Erosion and sediment control is necessary to ensure that sediment and sediment laden water does not leave the site during any construction activity that exposes native soils. Sediments laden water can seriously effect biological systems with natural riparian areas. The purpose of erosion and sediment control is to protect the natural environment, prevent the loss and transport of top soils and to protect air quality through dust control. Sediment is normally transported by Wind, concentrated stormwater runoff off and by construction equipment that travels into and out of construction areas. For a full description of how erosion and sediment control will be managed for the development see 17.47.070 below

- **17.47.030 Applicability**

  This section applies to our proposed project.

- **17.47.040 Abrogation and greater restrictions**

  The applicant has read and acknowledges this section.

- **17.47.050 Severability**

  The applicant has read and acknowledges this section.

- **17.47.060 Permit required**

  The applicant will obtain all necessary permits for erosion control required by any municipality with jurisdiction over this project prior to the start of construction.

- **17.47.070 Erosion and sediment control plans**

The developer, working with the project civil engineer will prepare Erosion and Sediment control plans (ESCP) and specifications for the development. The plans will provide all the details and best management practices (BMP's) so that the project contractor(s) can insure that sediment laden stormwater runoff does not leave the site during any storm event. Some of these BMP's include silt fence, catch basin filter "socks", straw bale wattles, temporary sediment settling basins, bio filtration bags and plastic covering of temporary stockpile material. BMP's will also ensure that construction equipment will not track sediment on the Beavercreek Road or Meyers Road. BMP's typically used for construction traffic include passive wheel washes and large aggregate construction pads at all ingress/ egress locations.

The project will expose more than 1 acre of the site as part of grading operations. Accordingly, a DEQ 1200 C permit will be obtained by the developer as part of the project.

Erosion and sediment control is a performance responsibility of the project contractor. The plans will ensure that the contractor has an understanding of the erosion control methods and specifications necessary to meet its performance specification and will meet the permitting conditions imposed by the City of Oregon City and the DEQ 1200C permit.

- **17.47.080 Plan implementation**

The applicant acknowledges that all portions of this section will be followed before and during the construction of the proposed development.

- **17.47.090 Plan performance guarantee and security**

The applicant acknowledges that a guarantee will be provided prior to development. The applicant asks that the form of this guarantee be provided by the appropriate City entity.

- **17.47.100 Correction of ineffective measures and enforcement**

The applicant acknowledges this section and understands the City has the power to utilize the methods stated in this section to enforce that the construction of the proposed development conforms with the standards and requirements of the approved Erosion and Sedimentation control plan and the erosion and sedimentation standards of Code section 17.47.

17.50 – Administration and Procedures

- **17.50.010 Purpose**

The applicant is currently planning to obtain the Site Plan and Design Review approval before proceeding with submittal of any concurrent building plans. However, depending on initial feedback and results of the Site Plan and Design Review review process the applicant reserves the right to change our mind and may decide to submit building permit plans to be reviewed concurrently.

- **17.50.030 Summary of the city's decision-making processes**

The applicant is submitting a Site Plan and Design Review application. According to the chart in this section of code this is a Type II process.

- **17.50.040 Development review in overlay districts and for erosion control**

This section does not apply as the proposed development does not fall into any of the zones or categories described here.

- **17.50.050 Preapplication conference**

The applicant held a pre-application conference on July 9th, 2013. The applicant requested a six-month extension to the pre-application conference deadline be allowed as permitted under subsection B of this section of code. No changes to the underlying zoning or building requirements have occurred between the time of the conference and the time of this application. The plan submitted here is also substantially the same to the plan and concept presented at the pre-application conference. The applicant's request for an extension was granted by the planning director.

- **17.50.055 Neighborhood association meeting**

The applicant held a Neighborhood meeting on August 15th. Oregon City provided mailing addresses for all residents within a 300 foot radius of the proposed project site. Notifications of the meeting were mailed to all residents on this list. The Neighborhood association was notified of the meeting via e-mail. E-mail was as approved as a method of notification by the Chairs of the neighborhood association. An exhibit with this application contains information on the notification of the meeting, meeting attendance and meeting comments.

- **17.50.060 Application requirements**

The applicant owns the property where the proposed development will be constructed.

- **17.50.070 Completeness review and one hundred twenty-day rule**

The applicant is aware of the deadlines and procedures for a complete application and for the review process after an application is deemed complete.

- ### 17.50.080 Complete application—Required information

  The applicant has submitted all information requested under this section.

- ### 17.50.090 Public notices

  The applicant is aware of the public notice provision of this Type II application and will follow section 17.50.100 regarding the on-property notification as directed by the City.

- ### 7.50.100 Notice posting requirements

  The applicant will follow the City's lead in posting a sign on the property that will describe notice of the proposed development.

- ### 17.50.110 Assignment of decision-makers

  We are aware the City Planning Director will make the decision on this land use application.

- ### 17.50.120 Quasi-judicial hearing process

  This section does not apply as we are not submitting permits for any land use that would require a Type III or Type IV decision.

- ### 17.50.130 Conditions of approval and notice of decision

  The applicant is aware of and has read this section.

- ### 17.50.140 Performance guarantees

  If conditions of approval require performance guarantees they will be provided per the requirements of this section.

- ### 17.50.150 Covenant with the city

  This section does not apply to us as the application is not a quasi-judicial decision process (Type III or Type IV).

- **17.50.160 Ex parte contact, conflict of interest and bias**

  This section does not apply to us as the application is not a quasi-judicial decision process (Type III or Type IV).

- **17.50.170 Legislative hearing process**

  This section does not apply to us as the application is not a quasi-judicial decision process (Type III or Type IV).

- **17.50.180 Objections to procedure**

  The applicant is aware of the objection procedures and has read this section.

- **17.50.190 Appeals**

  The applicant is aware of the appeals process for a Type II application as explained under this section of code and related sections of ORS.

17.50.200 Expiration of an approval

The applicant is aware that we have two years from final approval of this application to receive building permits for the proposed project.

17.50.210 Extension of an approval

The applicant is aware that we can request extension of an approval per the limitations of this section.

17.50.220 Reapplication limited

The applicant is aware of and has read this section.

17.50.230 Interpretation

The applicant is aware that the more restrictive requirements will apply.

17.50.240 Conformity of permits

The applicant is not aware of any way that we are not in conformance of any provisions of Title 16 and Title 17 and any other permits previously issued by the City for this site and/or this development.

17.50.260 Reconsideration of a final decision

The applicant is aware of its right to request a reconsideration of a ruling by the Planning Director.

17.50.270 Revocation of a previously approved permit

The applicant is aware that it must follow the conditions of the permit or face possible consequences outlined in this section.

17.50.280 Transfer of approval rights

The applicant is aware that the approvals granted here run with the land and can be transferred with a transfer of ownership in the land.

17.50.290 Fees

The applicant has included the application fee for a Type II Site Plan and Design Review Permit.

17.52 – Off-Street Parking and Loading

- ### 17.52.010 Applicability

  This section applies to our project

- ### 17.52.15 Planning commission adjustment of parking standards

  The applicant is not requesting any adjustments from the base parking requirements of the City code.

- ### 17.52.020 Number of automobile spaces required

  The table below includes the proposed unit count by unit type and calculates both the minimum parking and maximum parking numbers per the ratios given in Table 17.52.020:

Unit Type	Quantity	Min. Parking Ratio	Max. Parking Ratio	Min. Stalls	Max. Stalls
Studio Live/Work Stacked Flat Units	11	1	1.5	11	16.5
1-Bed/1-Bath Stacked Flat Units	58	1.25	2	72.5	116
2-Bed/2-Bath Live/Work Stacked Flat Units	15	1.5	2	22.5	30
2-Bed/2-Bath Stacked Flat Units	47	1.5	2	70.5	94
3-Bed/2-Bath Stacked Flat Units	10	1.75	2.5	17.5	25
5-Bed/5-Bath Stacked Flat Units	6	3	5	18	30
Total Stacked Flat Apartment Units	**147**			**212**	**311.5**
3-Bed/2-Bath Live/Work Towhomes	**36**	1.75	2.5	63	90
				min	**max**
Total Units on Site	**183**		**total parking**	**275**	**401.5**

The total parking provided on site is 332 stalls per 183 units for an average of 1.82 stalls per dwelling unit which falls within the range allowed as calculated in the table above.

All proposed stalls meet the dimensional requirements for the type and use of each proposed stall type. On-street parking has been included in the total parking stalls however will not be labeled in any way to restrict their use by the general public.

- ## 17.52.030 Standards for automobile parking

Our group parking areas are accessed by paved driveways that are located in the interest of public safety and in no cases are there groups of more than four parking spaces that would require backing up into public streets. No driveway slopes are greater than 15% and a conceptual drainage plan has been prepared by the civil engineer and submitted as part of this application package.

The proposed site plan includes only 0 degree (parallel) and 90 degree parking stall configurations which meet the dimensional requirements for standard dimension stalls per 17.50.303.D parking standard parking angle space dimensions table.

The proposed project does not include or have uses similar to those listed in line item E of this section and therefore is not subject to the carpool and vanpool parking requirements.

- ## 17.52.040 Bicycle parking standards

Per Table A of this section a minimum of 1 bicycle parking stall is required for every 10 units in Multi-family uses with three or more units with 50% of stalls required to be covered. For 183 proposed units on site, 18 bicycle stalls are required, 9 to be covered. The proposed site plan accounts for bicycle parking for the townhome units to be provided for within the attached garages; leaving the required stalls to be distributed among the stacked flat style buildings (A1-A3 and C1).

The proposed locations are indicated on the site plan at both ends of the buildings A1-A3 as well as at the parking lot side central entrance. Building C1 has a rack located in the plaza in front of the main building entrance. The locations shown represent stationary hoop-style bike racks securely attached to paved surfaces to which residents/visitors would utilize personal locks to store their bikes. The racks located at each end of buildings A1-A3 are positioned under a building cantilever above providing the code required cover.

All bike racks are located in close proximity to building entrances and adjacent to but not in the circulation path for convenience and to avoid conflicts with pedestrian and motor vehicle movement while maintaining direct access to a right of way.

- ### 17.52.060 Parking lot landscaping

All interior and perimeter parking lots have been landscaped per code. All trees selected will be a minimum of 2" caliper in size. All groundcover is spaced a maximum of 16" and no shrubs are spaced more than 4' on center.

- ### 17.52.070 Alternative landscaping plan

Not applicable. We are not utilizing alternative landscaping plans.

- ### 17.52.080 Maintenance

The applicant has read this section and acknowledges it.

- ### 17.52.090 Loading areas

No applicable as we are not proposing any commercial developments.

17.54 – Supplemental Zoning Regulations and Exceptions

- ### 17.54.010 Accessory buildings and uses

No accessory buildings are proposed with the submitted plan for review with the exception of a swimming pool. An in-ground swimming pool is planned between the clubhouse and the east property line. The swimming pool will not be located less than three feet from the property line. A fence no less than four feet in height shall be provided in the final design submittal.

- ## 17.54.020 Projections from buildings

  Buildings have been located on site such that there are no cases where a building projection extends into a required yard.

- ## 17.54.030 Setback exceptions

  The proposed site plan does not include the creation of separate lots; no through-lots exist.

- ## 17.54.060 Seasonal sales

  Acknowledged. The applicant is not planning for either of these types of sales to occur on the site as part of this application.

- ## 17.54.090 Accessory dwelling units

  We do not have any accessory dwelling units on the site.

- ## 17.54.100 Fences

  No fences are planned for the project application.

- ## 17.54.105 Live/work units

  Of the total 183 units on site 62 are proposed to be Live/Work units (36 townhome units and 26 ground floor stacked flat apartment units). As described in the code the Live/Work units were selected for use in the proposed site plan to meet the requirements of the MUC-1 zone and vision of the Concept Plan's mixed employment village by "providing flexibility by combining residential and commercial uses and allowing for commercial uses on the ground floor when the market is ready to support them".

  The proposed unit plans and elevations of the live/work units along with their placement on site meet the code criteria as follows:

  A. All 62 live/work units on site face onto and are clearly visibly from either an existing or new primary street/public way with locations for signage provided individually for each unit. The main front elevation of the live/work space meets the 50% transparency requirement by utilizing a storefront system. Windows are located with the sill between thirteen and thirty inches above the sidewalk and shall not be highly reflective or glare-producing.
  B. The business portion of all 62 live/work units is limited to the ground floor and does not exceed fifty percent of the square footage of the unit. The business area of the units range from 175 to 300 square feet.

C. The 36 townhome units have primary business entrance oriented towards either Beavercreek Road or the Meyers Road extension with alley access for refuse and recycling service and residential parking. The 26 ground floor apartment live/work units have their primary business entrance facing onto the proposed new public streets A and B. The ground floor apartment units do not have alley access but are served by an internal corridor for residential access to and from parking and refuse services located behind the buildings as an alternate means of meeting the intent of separating business and residential functions of the unit.
D. None of the business areas exceed 500 square feet in area on their own, therefore 1 stall per live/work unit is assumed; total 62 stalls. Shared use of the on-street parking is proposed for meeting the parking requirements for the live/work units. 21 on-street parallel stalls along Beavercreek Road would be available exclusively to the live/work units (not included in the overall site parking total as they are located on the existing public street) while the remaining parking needs are proposed to be met through shared use of the on-street parking along the Meyers Road extension and new internal public streets. The on-street parallel parking within the site would not at any time be assigned to residents and the hours of business operation of the live/work units would not materially overlap the residential uses; the primary use hours for the live/work users would occur during the daytime hours while many residents are away.
E. The number of employees shall be limited to five persons at one time.
F. Restrictions on the proposed live/work units shall be recorded as necessary.

17.62 – Site Plan and Design Review

- ## 17.62.050 Standards

A1) Landscape narrative

The landscape plan for this project has been designed to create a pleasing year-round environment for residents and to be an asset to the overall Oregon City community. All proposed plantings have been selected in accordance with the City's requirement in terms of sizing and spacing.

Plantings within the project are diverse in terms of colors, texture, and deciduous/versus evergreen plant material. Interior spaces within the project provide open, multi-use recreation spaces for tenants.

A2. Vehicular Access and Connectivity.

a. With the exception of required on-street parallel parking all proposed parking areas are located internally within the blocks behind buildings and additionally shielded from view off the public way by landscaping. The parking for building C1 is also an exception with parking on one side of the building set off the street and buffered by planted areas.
b. Site ingress is located off of Beavercreek Road by the extension of Meyers Road at the existing intersection. Additional signaling will be added to the intersection with the addition of the fourth leg per the traffic engineers report and recommendations. All internally proposed

intersections provide a distance greater than the minimum requirements for spacing to promote public safety. The turning radius provided for both public streets and alleys provide access for emergency vehicles to all sides of each building.

c. The site is designated as MUC-1 and has provided alleys for access to off-street parking facilities.
d. All vehicular access to parking facilities is from the alley loops.
e. Alleys are provided; standard does not apply.
f. No driveways occur on the site; standard does not apply.
g. Opportunity for connection to future adjacent sites is provided by the public street right of ways provided with the Meyers Road extension and new local Street A and Street B. No additional access easements are proposed at this time.
h. Streets will be dedicated; standard does not apply.
i. All public ways have been designed to comply with pedestrian access requirements.
j. Signage shall be provided at the end of the Meyers Road extension, Street A and Street B where they dead-end at adjacent property lines to inform the public that the dead-end street may be extended in the future.
k. The proposed site plan is larger than 3 acres in area and provides streets as required in Chapter 12.04; see responses under that section for detailed description of proposed street network.
l. Garages are provided only on the townhome buildings. All garages face onto the alleyway and are recessed from the prominent building façade to de-emphasize their presence.
m. No above-grade parking structures proposed; standard does not apply.

A3. With the exception of the high school the surrounding area of the site is predominantly single-family residential construction with traditional northwest vernacular; lap, shingle and board and batten siding with trim and accent features reminiscent of the craftsman style. The proposed building elevations for this project would utilized fiber-cement siding with 2 lap siding reveal depths with board and batten accent areas. A complimentary color palette would enhance the siding types and help integrate and the project into and enhance the community landscape.

a. Project site is not located in any of the four districts listed; standard does not apply.
b. The proposed site has not been identified as being located in a historic area; standard does not apply.

A4) Grading Narrative

The existing site is primarily a grassland which generally slopes toward the northwest at about 6 percent. Per the project geotechnical report the underlying soils consist of approximately 6” of vegetation and topsoil (which is not appropriate for structural fill) underlined by brownish red silt with some clay. An occasional aggregate rock (2 ft (-) diameter has been discovered within the test pits performed on the site. The underlying soils are poorly drained and there could be a moderate risk of expansive soils under moist and saturated conditions.

The grading for the property is shown within the site grading plan included in the development application. The plans shows excavations (cut) toward the south and east side of the development to depths of approximately 6 feet.
The plans shows embankments (fill) toward the north and west side of the development to depths of approximately 6 feet. Other than, the disposal of topsoil strippings, the earthwork volumes generated by total excavation and total embankments is weighted slightly towards more embankments. This earthwork imbalance is expected to be balanced through excess material generated as a result of roadway, building and utility excavations.

Due to the excavation and embankments required for the project, there will be a small amount of retaining walls constructed for the project. These will not exceed 5 feet in height and can mostly be designed as a standard "gravity" wall. All structural wall designs and calculations required for retaining walls will be prepared by a licensed structural engineer and submitted as part of final engineering design.

All grading will be fully protected from erosion through the implementation of a sediment and erosion control plan (see 17.47.010 above)

All embankments will be installed in accordance with the recommendations of the project geotechnical engineer in terms of meeting moisture content goals and relative soil compaction standards that will be required for the structural support of all roadways, buildings, retaining walls and trench backfill.

A5) Not Applicable. We are not in a Geologic Hazard Overlay District

A6) Drainage Narrative: See section 13.12 above and the preliminary drainage report

A7) Please see our earlier discussion of the requirements of Section 17.52 of the Code.

A8. Sidewalks and curbs are proposed on all new internal public roads and alleyways. Please see the site plan and the responses provided to Sections 12.04.170 through .199 above as well as the response to item A9 below for detailed information.

A9. Pedestrian Circulation System.

a. Pathways have been provided from all building entrances directly to the sidewalks located within the required right-of-ways. The Live/Work units in some instances have two pathways provided; one directly to the street with a short run of stairs to accommodate grade changes with a second path following grade providing an accessible route.
b. Pedestrian pathways are provided throughout the site to allow access from any point on the site to all public amenities. All building entries and exits are connected directly to the sidewalk along the street which is used predominantly used to meet this standard.
c. No elevated external stairways or walkways are proposed; standard does not apply.
d. All main building entrances on site are interconnected through the pedestrian walkway system.
e. No adjacent developments exist; standard does not apply.

f. Proposed on-site pedestrian walkways will be hard surfaced and at least five feet wide and be visually distinguishable from adjoining surfaces. Wheel stops will be provided in parking areas where walkways are directly adjacent to parking spaces other than parallel spaces. All pedestrian walkways located along a public street will be separated from the auto travel lane by a minimum five foot landscape buffer. All walkways adjacent to internal parking areas shall be raised above the parking lot by a 6" curb. Pedestrian crossing areas shall be readily distinguishable to alert drivers of the crossing area.

A10) Adequate maintenance of private improvements to the private grounds, including streets, drains and pathways, is planned by the applicant.

A11) Please see our earlier discussion of the requirements of Section 17.41 of the Code

A12) Natural Resources Overlay District – Not Applicable there are no natural resources identified for the property.

A13) The applicant has read this section of code and understands it.

A14) Water and Sewer Narrative

Water Service:

Water service with a separate meter will be provided to each building. A single water meter will be provided to each of the larger multifamily housing units and not an individual meter to each apartment. The community center and the mixed use (commercial/ residential) building north of Meyers Road. A separate meter is also anticipated to serve landscape irrigation purposes.

Where possible all watermains will be looped for two directional water supply and to provide for continuous water service during maintenance or other temporary valve closures. All public watermains will be extended to the property line within the new public roadways for future extension to adjacent properties as they develop. A blow off valve will be provided at the terminal waterline locations.

All water mains proposed with in the development and connecting to existing water mains in Beavercreek Road will be public waterlines designed and constructed in accordance with the City of Oregon City design standards. Where public waterlines are located outside of a dedicated public Right-of-Way, a public utility access and maintenance easement will be recorded for the benefit of Oregon City. The size and location of the easement is to be determined by the City as part of final engineering design.

Water service for domestic and firefighting services is available within Beavercreek Road along the length of the project. There currently exists two watermains in the roadway. The first is a 16" diameter main that is owned by the City of Oregon City. The second is an 8" diameter pipe owned by Clackamas River Water District (CRW). The project is currently located within Oregon City's water district.

Although water is available in Beavercreek rd from the 16" watermain, the available water pressure in that main is approximately 40 psi which is at the low end of the pressure required by the City of Oregon

City. There are a number of solutions to this pressure issue. The final solution will be determined through a collaborative effort between the developer, the City of Oregon City and CRW. The City of Oregon city is currently updating its water master plan. The selected option will need to be informed by the findings that result through that master planned effort. Some of the options under discussion include:

1. Provide a temporary solution until the City constructs a new reservoir that will increase the operating pressure in the 16" main. These temporary solutions include:
    a. Construct a new watermain within Beavercreek Rd that will connect to the outlet side of a CRW booster pump station approximately 800 feet south of the project site. This solution will require an inter-governmental agreement (IGA) between the City of Oregon City and CRW.

    b. Use the 16" main at its current operating pressure and construct booster pump stations where required on the project that will increase domestic use pressure where it is required for 2 and 3 story structures. Preliminary water pressure modeling indicats that dynamic pressure and flow necessary per the fire code to fight fires will be adequate to be served from the existing 16" water main and pressure.

2. Change the water service boundary so that the project can be permanently supplied by CRW.

As already stated, the final solution will be a combination of the above options and result from a collaborative effort between the Developer, the City of Oregon City and CRW.

Sanitary Sewer:

Public sanitary gravity sewer can be provided to all buildings within the development and will be designed to be consistent with City of Oregon City design standards. Where public sewers are located outside of a dedicated public Right-of-Way, a public utility access and maintenance easement will be recorded for the benefit of Oregon City. The size and location of the easement is to be determined by the City as part of final engineering design.

Existing sanitary sewer is available within an existing public utility easement within the Carrington Place sub-division which is contiguous to Beavercreek road. Per the Carrington Place record drawings, the depth to this existing sanitary sewer (flowline) at the terminal manhole is 8.75 feet which is of adequate depth to serve the development.

The City of Oregon City is currently updating its sewer master plan. The new masterplan will establish new or confirm existing sewer sub-basin boundaries. The proposed development is expected to be included in the Glennoak sewer sub-basin but that formal designation is still pending public notification. The master plan will also indicated what downstream capacity problems (if any) exist within the current sub-basin and if any capacity problems will result from the addition of sewer contributions from the proposed development. Finally the new sewer master plan will establish the available capacity of future developments within the Beavercreek Concept master plan area. Some of these future developments will connect to sewer mains installed as part of this proposed development. Accordingly, sewer mains will be extended to the property boundary within new public roadways to

accommodate sewer flows from future developments. Sewer mains will be sized once the sub-basin contribution from future development is determined through the master plan update.

A15. All proposed roadways have been designed to meet the criteria of Chapter 12.04 and the Street, Sidewalk and Public Places requirements of the Oregon City Municipal Code and consistent with the transportation master plan design standards. The impacts of the additional trips generated by the proposed project on the existing infrastructure have been studied in a formal traffic impact analysis which is included in this submittal package. No off-site projects were identified as a result of the traffic impact analysis and all on-site recommendations have been followed and incorporated into the plans.

A16) No public transit structure is currently planned as the site is not currently served by public transit at the perimeter of the site.

A17) The applicant will place all new utility lines underground in this development.

A18) ADA standards are followed in the site design of the proposed development.

A19. MUC-1 zone classification; standard does not apply.

A20. Screening of Mechanical Equipment

a. If mechanical equipment is located on the roof; screening measures complying with this section will be included to fully conceal the equipment with materials used on the primary façade in a way that coordinates with the buildings architectural design.
b. No through-wall mechanical units are planned for this project. If meters are installed in groups on the building's exterior, they will be properly screened from view through the use of plantings or a sight-obscuring enclosure constructed of one of the primary materials used on the primary façade of the building.
c. Any ground mounted above-grade mechanical equipment shall be screened in a way consistent with this code section and as approved by the community development director and utility provider.
d. All currently proposed and future mechanical equipment shall comply with the standards of this section.
e. No solar energy panels, photovoltaic equipment or wind power generating equipment is proposed; section does not apply.

A21. Building Materials

a. Proposed building materials for this project include fiber-cement lap siding and fiber-cement board and batten siding.
b. None of the listed materials are proposed for use with this project.
c. 1. Concrete block may be selected for use in the construction of the trash enclosures. If so they will be the split-face style blocks with a color tint.
   2. No metal siding proposed
   3. No EIFS proposed.

4. All fiber-cement and trim work to be painted prior to completion for full weatherization. All exterior surfaces shall be maintained by the property manager to prevent deterioration.

A22) The applicant has read and understands this section.

- **17.62.055 Institutional and commercial building standards**

Other Sections of this narrative cover all elements of required setbacks for commercial, live-work and residential structures in the MUC-1 zone. Additionally, a separate narrative on live-work units is provided as part of the overall Site Plan and Design Review application.

A. Located within the MUC-1 zone the proposed site plan includes Live/Work units. As such portions of this section will apply to the proposed plans. Per the pre-application conference notes form July 9, 2013 we have been requested to address sub-section D of this section.

A. 1. The proposed site plan has buildings located between 7 and 9 feet from the front property setback. This setback requires the incorporation of one element from the list provided in this section to allow an additional 5 feet of setback for a total of 10 feet. Line item h, enhanced landscaping has been selected and is represented on the landscape plans included with this submittal.

- **17.62.057 Multifamily Standards**

A number of techniques have been utilized in the design of the proposed buildings in order to ensure a high-quality development that is complimentary to the character of the surrounding neighborhoods. The following is a brief description of how each standard has been addressed:

A. The proposed project includes both traditional multi-family residential units as well as Live/work commercial units; the standards of this section apply to our project.
B. See discussion under section for compliance with Section 17.62.050, the following outlines compliance with the remainder of this section.
C. All street-facing ground-floor units (with the exception of the two units of building C1) are live/work units and in combination with the requirements of Section 17.62.055 the average setback of all buildings is seven to nine feet. The setback was chosen to satisfy both the five foot maximum setback of the commercial standards and the twenty foot maximum of this section. An additional five foot setback allowance per Section 17.62.055.D (by incorporating enhanced landscaping of 20 square feet per entrance) allows us the proposed setback distance shown in the submitted plans. We feel the selected setback not only meets the code requirements but also provides the more intimate pedestrian experience while maintaining enough privacy for the residential portion of the units.
D. The buildings have been specifically designed and located on the site to follow the street grid that has been created. The 'front' or prominent architectural façade of all buildings have been oriented towards the nearest public street and includes a variety of architectural features. On the

townhome units a combination of covered porch areas and planting beds provide interest and a visual transition between the public and private space.

The Apartments are much larger structures and use the modulation of the live/work units at street level to break up the mass into a more human scale. The individual entrances to the live/work units are highlighted by their closer proximity to the street as well as the enhanced planting areas around each entrance. The main entrance into the interior corridor of the apartment buildings is centered in the building and is recessed from the street and defined by wider pathways, enhanced planting areas and covered entryway.

The Clubhouse and C1 building employ similar techniques; cover entryways, planting areas and street-facing glazing to provide well-defined building entries that enhance the visual sense of the transition from public to private areas.

E. By designating a block size that allows for all of the parking to be located internally behind the buildings the proposed plan easily provides the required frontage. With the exception of two sections along new public Street A and Street B where required community open space is located (noted in table below) all frontages are exceeded. Frontage has been calculated along Beavercreek Road, the Meyers Road extension, and along new public streets A and B as shown in the table below:

Section 17.62.057.E Multi-Family Standards					
Frontage Segment		**Total Length**	**Building Frontage**	**Percentage**	**Notes**
Beavercreek Road					
	South of Meyers Road	726.69	520.5	71.63%	
	North of Meyers Road	147.6	88.42	59.91%	
Meyers Road					
	South side, Beavercreek to Street A	289.43	185	63.92%	
	South side, Street A to North PL	50.74	44.94	88.57%	
	North side				
Street A					
	South Side, Meyers to Street B	334.65	225.93	67.51%	
	South Side, Street B to East PL	225.42	220.8	97.95%	
	North Side, Meyers to Street B	346.15	275.43	79.57%	
	North Side, Street B to East PL	154.3	35	22.68%	A
Street B					
	South Side, Alley Loop to Street A	189.26	120	63.40%	
	South Side, Street A to East PL	133.87	96.5	72.08%	
	North Side, Alley Loop to Street A	189.26	0	0.00%	A
	North Side, Street A to East PL	188.95	120	63.51%	
Notes					
	A. Required community recreation/open space located within street frontage area.				

F. Pedestrian circulation

1. Pathways have been provided from all building entrances directly to the sidewalks located within the required right-of-ways. The Live/Work units in some instances have two pathways provided; one directly to the street with a short run of stairs to accommodate grade changes with a second path following grade providing an accessible route.
2. Pedestrian pathways are provided throughout the site to allow access from any point on the site to all public amenities. All building entries and exits are connected directly to the sidewalk along the street which is used predominantly used to meet this standard.
3. No elevated external stairways or walkways are proposed; standard does not apply.

Additional discussion of the pedestrian circulation system can be found with the response to Section 17.62.050 Standards, sub-section A.9.

G. All buildings proposed with this site plan are multi-family residential buildings or portions there-of and therefore are required to meet the standards of this section.
    1. A number of elements have been included in the design of the proposed buildings in order to meet the articulation and modulation requirements. The apartment buildings have both vertical and horizontal modulation which contributes to the visual articulation of the ground floor, middle floors and roof line. With the live/work units on the ground floor, a portion of all the units are a full five feet in front of the floor above and neighboring wall sections with distinct window and door appearance which defines this portion of the structure. The middle floors are also vertically modulated in a semi-repetitive way at every 12' structural bay; balconies provide modulations that are deeper and wider than the three foot by 4 foot minimum and are incorporated into the overall massing, not tacked on. The modulation of the upper floors is what allows for a distinctive roof line that is modulated to follow the building below. The roof has been standardized for constructability while still maintaining a symmetrical design that provides breaks in the plane at roughly twenty foot intervals. Gables are located along the roof line to provide additional visual breaks and are paired with the locations of the horizontal modulation of the live/work units at the ground floor to add additional emphasis to these units.

       The Townhomes follow many of the same techniques as the apartments. The ground floor area facing the street of all the units are to function as live/work spaces and have been designed with covered porch structures at the ground floor. These structures extend five feet out beyond the walls behind them and create the distinct visual articulation of the ground floor. The middle floors also include vertical modulation and repetitive window patterns to define this section of the building, and the roof line matches this modulation to create a distinctive roof line; completing the articulation requirements.

    2. The majority of our buildings will be visible from either an existing street or a proposed new public street. The townhome buildings have been designed in three configurations, 3-unit, 4-unit and 6-unit buildings, with the longest being 96'-3" wide and as such meet the requirements of this section.

The apartment buildings do exceed the 120 feet maximum and have been designed to provide the required modulation to break up the continuous building. The buildings have been designed in two wings that meet at the main building entry at the center of the building. At 20 feet deep and 36.5 feet wide this main entry area is what provides the required modulation to break the wings into 120 foot lengths.

3. The proposed rooflines of the buildings are a 6:12 slope throughout the project. By following the vertical modulation of the buildings as described in the previous sub-section the roofline has been visually broken into sections less than 35 feet measured horizontally.

H. The site plan includes a total of 13 proposed buildings comprised of 7 total building types. Three of the buildings are 3-story stacked-flat style buildings that share a similar appearance, the community center and building C1 are unique building types and the remaining 8 buildings are townhomes that are configured as 3-unit, 4-unit, 4-unit/jogged, and 6-unit buildings. Building placement along Beavercreek Road was especially important with the frontage exceeding 700 feet; the multiple townhome configurations were developed and placed strategically to ensure a varied look along this prominent public way.

I. With 183 total units on site the code requirement for unit diversity for this project is four unit types representing a minimum of ten percent of the total units per type. The table below provides the proposed unit counts of the project and demonstrates that in addition to 4 unit types of at least ten percent there are 2 additional unit types for a total of 6 unit types in the project. This does not include the Type A accessible units which would provide additional unit types.

17.62.057.I Multi-Family Standards - Unit Type Diversity		
Unit Type	**Quantity**	**Percentage**
1-Bed/1-Bath Stacked Flat Units	58	**31.69%**
2-Bed/2-Bath Stacked Flat Units	47	**25.68%**
3-Bed/2-Bath Stacked Flat Units	10	5.46%
5-Bed/5-Bath Stacked Flat Units	6	3.28%
Total Stacked Flat Apartment Units	**121**	
Studio Live/Work Stacked Flat Units	11	6.01%
2-Bed/2-Bath Live/Work Stacked Flat Units	15	8.20%
Total Stacked Flat Apartment Live/Work Units	**26**	**14.21%**
3-Bed/2-Bath Live/Work Towhomes	**36**	**19.67%**
Total Units on Site	**183**	

J. The proposed site is located within the MUC-1 zone which allows commercial uses, however is not strictly a commercial district and is not in a neighborhood with an established pattern of raised dwelling units. We have located our buildings within 15 feet of the sidewalks, so with a combination of the requirements happening within our site the application of this standard is

unclear. What we propose as a solution to this section is in part solved by the proposed live/work units at the ground floor. With the Live/work units the spaces at ground level there will not *be a* conversion to commercial use as *the space already is* a commercial use. Because the commercial function of the space is already being meet within the proposed live/work units there is no likelihood of a future commercial tenant requiring 13 foot ceilings. Therefore we are proposing a 10 foot ceiling on all ground floor units to promote the aesthetic look of a commercial use from the exterior while providing a more residential scale to the residential portions of those units. The narrative on live-work units shows that many, if not all, of the commercial businesses that operate in live-work structures do not require 13 foot ceilings as they are not required to have extensive HVAC systems that typically are the reason for 13 foot ceilings in commercial spaces.

K. To meet the required five points for multifamily building materials the proposed buildings have included the following architectural details from the provided list:
    1. Decorative porches on the townhome buildings
    2. Enhanced landscape beds at building entries.
    3. Decorative light fixtures at each building entry
    4. Decorative roof line with multiple gables
    5. Decorative railings on apartment balconies.
    6. Decorative trimwork at ground floor windows and doors.

L. All windows in the project will be detailed to provide the required 2" recess from the façade and will be trimmed with either 4" or 6" trim that will be of a contrasting color to the building base color. Numerous windows and doors face on to the street and as measured at the first floor the transparency is as follows:
    i. Apartments – main entry elevations = 62%
        - side street facing façade = 58%
    ii. Townhomes – street facing façade = 45%

M. The proposed multi-family development is located in a site that is zoned as MUC-1 and therefore does not fall subject to the requirements of the section per item 2. However, common open spaces have been provided to enhance to overall project with common open spaces centrally located to be easily accessible by residents and to create focal points within the site. An open space located halfway along the Beavercreek frontage provides a visual break in the buildings along Beavercreek and is aligned with new Street B to provide a pedestrian link into the site. Further down street B at the intersection with Street A is the major common open space located on the west corner of the intersection. The pool area located to the east of the community center also provides additional community recreation space.

N. The proposed project located in an MUC-1 zone shall comply with the requirements of line item 2 of the section. With 183 proposed units the area for common and private open space required by this section is 50 square feet per dwelling unit, which equals 9,150 square feet. In addition to the private decks of the apartment units common open space has been provided as follows:

Common Open Space	
Beavercreek mid-block open space	3000
Meyers Road North corner open space	3500
Intersection of Street A and Street B open space	7000
Community center pool area and open space	3600
Open space between buildings A1 and T7	2700
Total Common Open Space Provided	**19800**

- ### 17.62.065 Outdoor Lighting

The submitted site lighting plan meets the standards of this section.

- ### 17.62.080 Special Development Standards along Transit Streets

A. Direct and convenient pedestrian access is a key feature of the proposed plan in order to provide access to the businesses utilizing the Live/work units throughout the site. An in-depth discussion of the pedestrian circulation system has been provided under the responses to Sections 17.62.050.A.9 Standards and 17.62.057.F Multifamily standards.

B. While the proposed site does not currently front on any transit routes, the site has been designed to comply with this section because of the future plans to extend a current route down Beavercreek Road to a planned stop at the Meyers Road intersection with potential for further extension south on Beavercreek Road.

C. Proposed townhome buildings T1 through T7 face onto Beavercreek road of which all units are Live/Work units. Each live/work unit has its main entrance oriented toward Beavercreek Road and will be provided with the required entry lighting. Building C1 is also located on Beavercreek Road and has its main entry located off of the open space at the intersection with Meyers Road. Clear access from the transit street to the main building entrance is provided through the open space.

- ### 17.62.085 Refuse and Recycling Standards

A. Trash enclosure locations are indicated on the proposed site plan by the letter 'T'. Four stand-alone trash enclosures are provided, located within close proximity of buildings A1, A2, A3 and C1 respectively. The enclosures will be screened by permanent walls on 3 sides with a gate on the fourth side facing onto the alley loop through which residents and the collection agency will access the bins. The trash enclosures will be designed in a style complimentary to the buildings and are located off the alley aisle as to not interfere with vehicle parking and circulation. Both trash and recycle bins will be provided to meet the estimated demand.

17.65 – Master Plans

N/A – This is not a phased project so this section does not apply.

OREGON CITY
Community Development Department
221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

PA-13-24: Pre-application Conference Planning Staff Advisory Notes
Address: 19896 Beavercreek Road
Date of Pre-Application Conference: July 9, 2013

Review Process
It is expected that the applicant will seek approval of the development through the Site Plan and Design Review application process. This is a Type II process defined in 17.50.030 - Summary of the city's decision-making processes.

If the applicant seeks adjustment of any applicable standards in the applicable zoning code, or wishes to develop the site in phases, a Variance, or else a Master Plan Type III approval from the Planning Commission would be the appropriate application process, with each phase submitted as a subsequent Detailed Development Plan through the Type II process. The Master Plan and Detailed Development Plan process is discussed in Chapter 17.65 - MASTER PLANS.

In either case, whether Type II or Type III, the applicant is entitled to a decision from the city for a decision of approval, approval with conditions or denial within 120 days of deeming the application complete, by state law.

Type II decisions are rendered by the Community Development Director, with appeal on the record to the City Commission, and then onto LUBA.

Type III decisions are rendered by the Planning Commission, with appeal on the record to the City Commission, and then onto LUBA.

Site Plan Comments
The site plan indicates 2 local public streets "A" and "B" that connect to adjacent developable parcels. Oregon City code requires local public street connectivity as well as collector level public street connectivity (aka a "public street grid"). Alley Loops A, B and C will be required to provide public access easements.

The extension of Meyers Road east of Beavercreek Road is designated as a Medium-Term, Likely to be Funded, Industrial Minor Arterial road in Oregon City's latest Transportation System Plan update, soon to be adopted (See http://octransportationplan.org/draftdocument/ Project #D47). Typical ROW width for minor arterial will be 94' but may be superceded through the site plan process by the PRCP. The concept plan defines Meyers Road extension as a Collector Green Street in

the August 2008 final draft of the Beavercreek Road Concept Plan, with a ROW width of 86'. Please see public works comments for more details.

The expansion of Beavercreek Road is designated in the city's draft TSP. The project is on the Likely to be Funded, Major Arterial road with a ROW width of 94' in Oregon City's latest Transportation System Plan update, soon to be adopted (See http://octransportationplan.org/draftdocument/ Projects #D80 and #D81). The BRCP defines this section of Beavercreek Road as a three lane arterial section with a ROW width of 90'. Since a parking lane or parking pockets will also be required abutting the live-work section (consistent with the TSP), the ultimate amount of dedication required is variable. Please see public works comments for more details.

The overall street system appears to do a good job of setting up the framework for the transportation system of the BRCP, and a decent job of anchoring the Main Street as a transit-supportive street.

Live-Work concepts

Please develop an explanation of the live work unit concept and how it accomplishes the vision of the Mixed Employment Village on the formal application. It would be helpful to get formal comments from Tri-Met regarding the development proposal in order to determine whether additional transit stops will be needed on Beavercreek Road or the Meyer's Road extension.

The building layout and orientation appears to meet the intent of the Conditions of Approval of the Zone Change ZC 10-01.

Staff has some questions regarding the first floor live-work concept. For example: will these spaces be developed under commercial building codes? Will they have adequate ceiling height to accommodate commercial use as required by the site plan review code? What kinds of tenants does the applicant anticipate for these areas in order to meet the intent of the mixed employment village? Will the setback area in front of the units be properly treated as a public amenity area, rather than private space? Please elaborate.

Staff anticipates the need for on-street parking on Beavecreek Road. The ultimate street section will require review and approval by both Clackamas County Transportation and Oregon City.

The alley access and parking to the rear and sides of the building appears to meet code.

The specific code sections that need to be addressed are outlined below.

OREGON CITY
Community Development Department
221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

Approval Criteria to Address in Narrative:

1. Oregon City Municipal Code

Click on the hyperlinks below to see code section.

Chapter 17.50 - ADMINISTRATION AND PROCEDURES

A pre-application conference with the Caufield Neighborhood Association is required for a complete application. Contact Kattie Riggs, Staff Liaison to the Neighborhood Associations, to set up a meeting. Kattie can be reached at (503) 496-1582 or via email kriggs@orcity.org.

- Chapter 17.29 - "MUC"—MIXED-USE CORRIDOR DISTRICT

Staff Comment: Compliance will be determined once a detailed site plan has been submitted and adequacy of the setback area as a public amenity area has been determined. Otherwise a 5' maximum front setback is the standard of the district. May be increased through 17.62.055.D.

Chapter 17.62 - SITE PLAN AND DESIGN REVIEW

- Please respond to all applicable standards

17.62.050 - Standards.

Comments:

A.1. Landscaping: Show detailed landscaping plan with submittal. Show parking lot landscaping (minimum exterior, building buffer and interior requirements).
A.2 Vehicle Access and Connectivity: subsections (a) and (f)
A.3. Building Structures – appears to be met.
A.4. – A.6. Grading, Geologic, Drainage – See Public Works Comments.
A.7. – Parking – See 17.52 below.
A.8. - Sidewalks and Curbs. Compliance to be determined.
A.9. - Pedestrian Circulation. Compliance to be determined.
A.10. – Maintenance. Compliance to be determined.
A.11. – Tree Protection – Compliance to be determined.
A.12. – NROD. Not applicable.
A.13. Compliance to be determined.
A. 14. Water and Sewer - See Dev. Services Comments (Bob C.)
A.15. Adequate ROW and Street Improvements, Level of Service (LOS).

- Comment: Oregon City code requires local public street connectivity as well as collector level public street connectivity (aka a "public street grid"). The public street grid proposed appears to meet the intent of the Beavercreek Road Concept Plan, the City's Street Standards as outlined in the current and proposed Transportation System Plan (currently being updated), and OCMC 12.04.255.

17.62.055 - Institutional and commercial building standards.

OCMC 17.62.055.D.1., cross referenced from OCMC 17.29 MUC-1 above, applies to both the apartment buildings and the commercial building on the site.

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 five 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 twenty square feet of landscaping or planter boxes for each tenant facade fronting on the activity area.

g. Outdoor café.

h. Enhanced landscaping or additional landscaping.

i. Other elements, as approved by the community development director, that can meet the intent of this section.

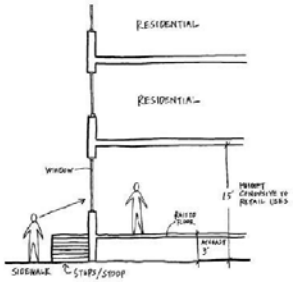
17.62.057 - Multi-family standards.

The current pre-app site plan provides some details with regard to the multi-family standards but further details will be needed at formal submittal time.

A few key sections of these standards are repeated below:

Diversity of unit types. Multifamily buildings with more than seventy-five units are required to provide four unit types representing a minimum of ten percent of the total units per unit type 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 access).

J. Raised Ground Floor. This is particularly important when dwelling units are within fifteen 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 thirteen-foot tall ground floor height to allow future conversion to commercial uses where desirable. Such projects can utilize a false floor thirty-six inches above the ground for residential uses to increase residents' privacy.

- Chapter 17.52 - Off-Street Parking and Loading

Parking lots on the submitted plan are behind or to the side of buildings, per code. The street grid that is proposed does the heavy lifting of facilitating compliance with this requirement. Good job.

Chapter 17.52 also regulates the minimum and maximum amount of required parking, based on the entire site and the specific uses within it, so a clearer table showing parking minimums and maximums as required by code will be needed at formal submittal. One clear way of calculating compliance for the entire site is shown below:

Land Use	Min spaces	Max spaces	Parking Required	Parking Proposed
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		
Live-Work (not specified in code)				
Office	2.7 per 1000 sf GLA	3.3 / 1000 sf GLA		
Retail	4.1 per 1000 sf GLA	5 / 1000 sf GLA		

Applicant will need to provide a detailed explanation of the amount of parking proposed on site and provide an adequate rationale for the amount of parking provided for land uses not specifically listed in the code.

On-Street Parking

On-street parking can be credited toward off-street parking minimums.

Parking Reduction Allowances / Incentives

Applicants may propose a reduction in the amount of off-street parking required, for transit oriented development, transportation demand management, shared parking, and available on-street parking. We encourage the applicant to review this section to reduce the overall parking.

Staff could not determine at this point whether the overall landscaping, as well as the parking lot landscaping complies with code (i.e. perimeter, interior and building buffer landscaping). There are some zoning incentives for LID treatments written into the design review code that allows pervious and LID type treatments to be credited towards landscaping requirements. At least 10% of the interior of parking lots must be landscaped. A landscape island is required between every 8 parking spaces. The applicant may propose an alternative LID solution for the parking lots, in which case dimensional landscaping standards may be altered.

Chapter 17.41 - TREE PROTECTION STANDARDS

A tree plan is required which indicates the location of all trees on the site with a diameter of 6" DBH or greater. The applicant may select one or more of 4 options for how trees will be protected, removed and / or mitigated if removed from the site.

Chapter 17.65 - MASTER PLANS (If Master Plan with Detailed Development Plan)

If the applicant wishes to develop the site in phases, a Master Plan with a Detailed Development Plan is required. This allows the applicant to phase site development over a 20-year period. This is a Type III Planning Commission review. The Master Plan process also allows the applicant to request specific code adjustments with the Master Plan (like a variance) for approval by the Planning Commission.

2. Conditions of Approval from Zone Change PZ 10-01 / ZC 10-01 – See Attached.

Since the Beavercreek Road Concept Plan has not been adopted yet, the proposed development must meet the intent of the Mixed Employment Village in the Beavercreek Road Concept Plan per the Conditions of Approval attached to the file PZ 10-01 / ZC 10-01.
http://www.orcity.org/sites/default/files/BCReport090908Final.pdf

This parcel was rezoned conditionally in 2010, with the understanding that actual development of the parcel would be complimentary to the realization of the Beavercreek Road Concept Plan as a mixed-use employment area. The preferred land uses would be those that generate long-term employment. The intent of the Mixed Employment Village is as follows:

- Allows a variety of uses in a village-oriented transit hub
- The purpose of the Mixed Employment Village is to provide employment opportunities in an urban, pedestrian friendly and mixed-use setting.
- allows a mix of retail, office, civic and residential uses that make up an active urban district and serve the daily needs of adjacent neighborhoods and Beavercreek Road sub-districts
- 3-5 Stories
- Active Street Level
- Program connections to OCHS and CCC.

Bearing this intent in mind, it would be advisable to design the apartment buildings to support mixed uses, ground floor retail and or office, and live-work opportunities. As required in 17.62.057 - Multi-family standards., subsection (J), a Raised Ground Floor with a thirteen-foot ground floor height is required in order to allow future conversion to commercial areas. Such projects can utilize a false floor thirty-six inches above the ground for residential uses to increase residents' privacy.

3. Transportation

Traffic Impact Analysis is required. Please contact the City's transportation consultant John Replinger for further information, and to determine whether a more detailed Transportation Planning Rule (TPR) analysis is required by ODOT.

ODOT staff will be present at the pre-application conference and so will John Replinger.

Secondly, the parcel is critical to providing transportation contiguity for the remaining re-developable parcels of land which abut the site. The applicant must show how the proposed development plan meets not only the urban design intent for the buildings and uses, but also the conceptual transportation plan embodied in the Beavercreek Road Concept Plan. – Hybrid Plan Circulation Framework.

Please submit the formal Pre-Application Conference Summary (to be obtained from staff following completion of the pre-application conferences) with the Master Plan, Detailed Development Plan, or Site Plan and Design Review Application.

Attachments:

- Pre-application Conference Summary:
  - Public Works Comments
  - Planning Division Comments
- Conditions of Approval from ZC 10-01
- TPR documentation from ZC 10-01

Additional Code Sections

Written responses to the following code sections will be required for a complete application:

⇒ Chapter 12.04 - STREETS, SIDEWALKS AND PUBLIC PLACES
⇒ Chapter 12.08 - PUBLIC AND STREET TREES
⇒ Chapter 13.08 - SEWER REGULATIONS (Requires compliance with Sanitary Sewer Master Plan.)
⇒ Chapter 13.12 - STORMWATER MANAGEMENT
⇒ 13.12.080 - Submittal requirements.
⇒ 13.12.090 - Approval criteria for engineered drainage plans and drainage report.
⇒ Chapter 17.29 - "MUC"—MIXED-USE CORRIDOR DISTRICT
⇒ Chapter 17.41 - TREE PROTECTION STANDARDS
⇒ Chapter 17.47 - EROSION AND SEDIMENT CONTROL
⇒ Chapter 17.50 - ADMINISTRATION AND PROCEDURES
⇒ Chapter 17.52 - Off-Street Parking and Loading
⇒ Chapter 17.54 - SUPPLEMENTAL ZONING REGULATIONS AND EXCEPTIONS (Fences, Hedges and Walls, Accessory Structures, Allowable Projections, etc.)
⇒ Chapter 17.62 - SITE PLAN AND DESIGN REVIEW
  - 17.62.050 - Standards.
  - 17.62.055 - Institutional and commercial building standards. (Live-Work Units)
  - 17.62.057 - Multi-family standards. (Apartments)
  - 17.62.065 - Outdoor lighting.
  - 17.62.080 - Special development standards along transit streets.
  - 17.62.085 - Refuse and recycling standards for commercial, industrial, and multi-family developments.
⇒ Chapter 17.65 - MASTER PLANS (if phasing or zoning adjustments to a master plan are requested)

Responses to Applicant's Specific Questions:

1. Please confirm if there are unpublished conditions to the prior zone change of the property or to the un-adopted provisions of the Beaver Creek Road Concept Plan or conditions that have been put in place since the re-zone was adopted.

Not that we are aware of.

The timing of the city's adoption and implementation of the BRCP is undetermined due to pending decisions on appeals of the regional Metro urban and rural reserves decisions. Contact Tony Konkol, Community Development Director for further details.

2. Please provide guidance or specific criteria as to the study parameters of a Transportation Impact Analysis that will need to be conducted.

3. Please provide guidance or contact with ODOT regarding improvements to Beavercreek Road.

Major issues from a transportation perspective are compliance with the statewide Transportation Planning Rule and the city's transportation system plan. These issues require a thorough scoping of the revised TIS with ODOT, County and City transportation staff. Traffic Impact Analysis is required. Please contact the City's transportation consultant John Replinger for further information.

ODOT staff will be present at the pre-application conference and so will John Replinger.

Beavercreek Road is under County jurisdiction. Previously, our contact with the County has been Ken Kent.

4. SDC Credits, reimbursements.
Please coordinate this though Public Works . Contact is Todd Martinez, P.E., Development Services.

5. Process, Timelines, Notifications, Appeals.
Chapter 17.50 - ADMINISTRATION AND PROCEDURES , provides the code for all of these items. Staff will review these procedures at the Pre-App.

OREGON CITY

Public Works – Development Services

625 Center Street | Oregon City OR 97045
Ph (503) 657-0891 | Fax (503) 657-7829

PRE-APPLICATION MEETING NOTES
July 5TH, 2013

Project Number: PA 13-24
Project Name: Beavercreek
Meeting Date: July 9th, 2013

GENERAL COMMENTS

1. The Applicant is responsible for this project's compliance with Engineering Policy 00-01. The policy pertains to any land use decision requiring the Applicant to provide any public improvements.
2. The Applicant shall sign a Non-Remonstrance Agreement for the purpose of making sanitary sewer, storm sewer, water or street improvements in the future that benefit the Property and assessing the cost to benefited properties pursuant to the City's capital improvement regulations in effect at the time of such improvement.
3. The Applicant shall provide an Erosion Prevention and Sedimentation Control Plan to the City for approval.
4. All applicable System Development Charges (SDC) shall be due and payable upon building permit issuance.
5. A grading permit shall be obtained from Development Services for the on-site work.

ENGINEERING - UTILITIES

STREETS

1. The existing right-of-way (ROW) on Beavercreek Road is 60-feet, and it is a County street. It is operating as a major arterial. The street improvements include 54-feet of pavement in good condition which includes two bikes lanes, two travel lanes and a medium that is also used as a turn lane. On the south side there curb, a 6 foot planter strip with street trees and a 6 foot sidewalk. There are also street lights on the south side. The north side consists of a shoulder and a storm drainage ditch.

   At a minimum, improvements on the north side will include curb & gutter, a 6 foot sidewalk, a 8 foot parking lane, and an 8 foot storm drainage swale with street trees. The County may require additional improvements.

2. The intersection of Beaver creek Road and Meyers Road currently has three legs as Meyers Road does not extend to the north. There is a traffic light and pedestrian crossing lights. Entering the intersection from the south and west there are turn lanes.

In the proposed configuration with Meyers Road extended through the intersection the traffic signals and lanes striping will need to be modified.

3. The ROW for any new local streets (internal) should meet the requirements of the Beavercreek Road Concept Plan. The ROW would be 62-feet wide. The improvements would consist of two travel lanes, parking on both sides, planter strip and sidewalk on both sides, and curb extensions with flow through stormwater planters at the intersections.

4. The extension of Meyers Road would be to collector street standards per the Beavercreek Road Concept Plan. The ROW would be 86 feet wide. The improvements would consist of two travel lanes, two bike lanes, parking on both sides, planter strip and sidewalk on both sides, curb extensions with flow through stormwater planters at the intersections, and a landscape median. The landscape median may be modified to a turn lane at the intersection of Beavercreek Road.

5. The County may have requirements for the Meyers Road alignment at the intersection of Beavercreek Road. Previously a 50 foot long tangent section at 90-degrees was required.

STORMWATER

6. There are no storm drainage facilities (collection, ponds, treatment, etc) adjacent to the proposed development, but there is a drainage ditch along Beavercreek Road. Both storm detention and treatment will be required. The Beavercreek Road Concept Plan calls for a three tiered approach to storm drainage: LID approaches, greenstreets and finally regional facilities. The proposed development appears to be in alignment with this approach. To verify that this will work, a full storm drainage report per City standards will be required as part of the application that includes infiltration testing.

   It is unclear whether the entire storm drainage can be infiltrated, and it is likely that an overflow will be required. The overflow will need to be defined, and the downstream impacts will need to be evaluated.

WATER

7. There is a 16-inch water line on Beavercreek Road that is served by the Henrici Reservoir. The overflow elevation of the reservoir is 592 feet. There are two pressure zones in the vicinity of the proposed development: the Upper pressure zone and the Fairway Downs pressure zone which is served by a booster pump station near Glen Oak Road. The boundary between the two pressure zones is approximately Meyers Road. It appears that the proposed development is located in an area that would be served by both pressure zones. Per the master plan, a change in the boundary between the two pressure zones is proposed when a future tank is constructed and 12”/16” pipelines are extended.

8. The water distribution system in each pressure zone would need to be looped. Temporary lines may need to be installed to provide looping until additional development occurs. The lines will also need to be located such that they can be extended to serve the rest of the Beavercreek Roan Concept Plan area with the appropriate pressure zone and looping. Development within the Fairway Downs pressure zone may require future tank improvements to provide both the domestic water supply and fire flows due to the existing capacity of the booster pump station.

9. It is unclear that there is sufficient fire flow in both pressure zones for the proposed type of development. The fire flow capacity of the existing system should be verified and compared to the requirements of the Clackamas County Fire District. Improvements may be required. New fire hydrants should be located per the Fire District.

10. New water lines within the development would be either 12 or 8 inches depending upon the location within the distribution system. The 12 inch pipe is needed to form the backbone of the system, and the 8 inch pipe would be used elsewhere.

SANITARY SEWER

11. The applicant has indicated an extension of the sanitary sewer from the end of the Emerson Court cul-de-sac across private property. This is not acceptable if there is a method to provide service that keeps the pipe in the ROW. This can be done on either Meyers Road or Beavercreek Road.

12. The sanitary sewer master plans call for this area to be served by an extension of a 15 inch pipe along Beavercreek Road. The end of the public sanitary sewer is approximately 3,700 feet from the property to the west. It is a 12 inch line just east of Marjorie Lane. There is 8-inch sanitary serves the High School and Community College that is closer, but it is private. There are also CIP improvements required on the public line all the way to Highway 213. If the applicant wishes to connect to the sanitary sewer along Beavercreek Road per the master plan, then a 15 inch pipe will need to be constructed from the property to the end of the public sanitary sewer. Additional CIP improvements may be required depending upon system capacity. The applicant would need to model the existing pipe with the addition of the proposed development. If there are capacity issues, then the CIP projects would need tobe constructed.

13. If the applicant wishes to connect to the sanitary sewer along Meyers Road, then the entire sub-basin would need to be modeled. The additional flow would be from the proposed development and the additional area of the Beavercreek Road Concept Plan area that would discharge to it. The CIP would need to be updated. Per the master plan, approximately 1,300 feet of 10” pipe in Glen Oak Rd and a section just south of Glen Oak Rd need to be replaced with 12” PVC pipe to provide additional sewer

capacity and are required for buildout to prevent overflow conditions. Additional CIP improvements may be required depending upon system capacity. If there are capacity issues due to the proposed development, then the CIP projects would need to be constructed.

14. The pipe within the development will need to be sized for the entire area of the Beavercreek Road Concept Plan area that will flow through the proposed system.

15. The applicant could coordinate additional modeling efforts with Brown & Caldwell. They are in the process of modeling the new Sanitary Sewer Mater Plan for the City. Additional modeling efforts would be funded by the applicant.

Rezoning Ordinance Conditions of Approval

ORDINANCE – Conditions of Approval number 4:

4 Based on the demonstrated significant effect to the intersection at Highway 213/Meyers Road, before receiving building permits the applicant shall contribute a proportional share of funding for the construction of the westbound right turn lane at the OR 213/Meyers Rd intersection. The amount of the proportional share shall be determined based on a revised traffic impact analysis that will be submitted at the time a development application is submitted when the proposed uses are known.

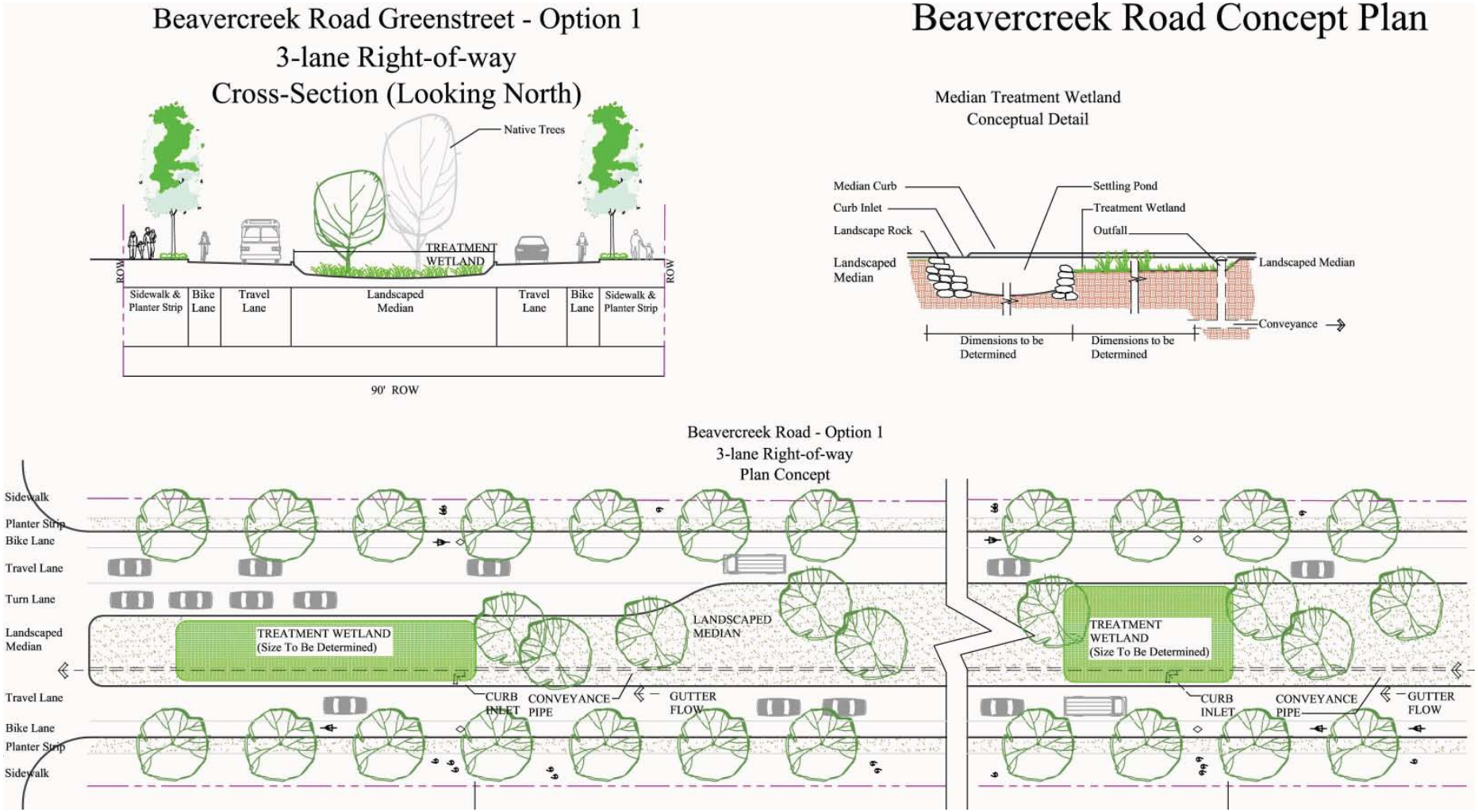


Figure 15 - Beavercreek Road Green Street

OREGON CITY

Public Works

625 Center Street | Oregon City OR 97045
Ph (503) 657-0891 | Fax (503) 657-7829

Estimate of System Development Charges

Applicant Information

Beavercreek Road, LLC
600 University St, Suite 1708
Seattle, WA 98101
206-535-6248
apt@mlibrantarch.com
PA 13-24

Site Information

Site Address: 19896 Beavercreek Road, Oregon City, OR 97045
Tax Lot No.: 32E10C00800
Lot Area: 423,403 square feet
Zoning Type: Mixed use corridor 1

Land Use Information

Proposed Trans/Bike Ped Category:	Apartment	
Charge Basis:	171	Number of dwelling units
Existing Use: (if applicable)	SF Detached	
Reduction Basis:	-	
Proposed Sanitary Sewer Category:	Multi-family residential (2+ units)	
Charge Basis:	171	Number of dwelling units
Existing Use: (if applicable)	Single-family residential	
Reduction Basis:	-	
Water Category:	No water meter	Size of water meter
Meter Equivalents:	-	
Proposed Parks Category:	Multi-family residence	
Charge Basis:	171	Number of dwelling units

Schedule of Charges

Transportation	**$814,195.06**
Vehicles	799,428.66
Reduction based on mixed-use criteria	0.00
Reduction based on existing use	(7,615.76)
Add-back for existing use in mixed-use area	0.00
Bicycles and pedestrians	22,382.16
Reduction based on existing use	0.00
Sanitary sewer	**$524,782.89**
Oregon City	252,311.27
Reduction based on existing use	(1,844.38)
Tri-City Sanitary District	276,336.00
Reduction based on existing use	(2,020.00)
Stormwater	**$46,941.86**
Oregon City Charge on New Development	47,642.49
Reduction based on existing use	(700.62)
Water	**$0.00**
Oregon City	-
Reduction based on existing use	-
South Fork Water Board	-
Reduction based on existing use	-
Parks	**$479,140.95**
Oregon City	479,140.95
Reduction based on existing use	-
Total SDC and Agency Summary	**$1,865,060.76**
Oregon City	1,590,744.76
South Fork Water Board	-
Tri-City Sanitary District	274,316.00

Prepared by: R. Todd Mark

City Engineer _____

Date: _____

OREGON CITY

Public Works

625 Center Street | Oregon City OR 97045
Ph (503) 657-0891 | Fax (503) 657-7829

Estimate of System Development Charges

Applicant Information

Beavercreek Road, LLC
600 University St, Suite 1708
Seattle, WA 98101
206-535-6248
0
PA 13-24

Site Information

Site Address: 19896 Beavercreek Road, Oregon City, OR 97045
Tax Lot No.: 32E10C00800
Lot Area: 423,403 square feet
Zoning Type: Mixed use corridor 1

Land Use Information

Proposed Trans/Bike Ped Category:	Condo/Townhouse	
Charge Basis:	36	Number of dwelling units
Existing Use: (if applicable)	SF Detached	
Reduction Basis:	-	
Proposed Sanitary Sewer Category:	Multi-family residential (2+ units)	
Charge Basis:	36	Number of dwelling units
Existing Use: (if applicable)	Single-family residential	
Reduction Basis:	-	
Water Category:	No water meter	Size of water meter
Meter Equivalents:	-	
Proposed Parks Category:	Multi-family residence	
Charge Basis:	36	Number of dwelling units

Schedule of Charges

Transportation	**$145,867.52**
Vehicles	141,155.48
Reduction based on mixed-use criteria	0.00
Reduction based on existing use	0.00
Add-back for existing use in mixed-use area	0.00
Bicycles and pedestrians	4,712.03
Reduction based on existing use	0.00
Sanitary sewer	**$111,294.16**
Oregon City	53,118.16
Reduction based on existing use	0.00
Tri-City Sanitary District	58,176.00
Reduction based on existing use	0.00
Stormwater	**$47,642.49**
Oregon City Charge on New Development	47,642.49
Reduction based on existing use	0.00
Water	**$0.00**
Oregon City	-
Reduction based on existing use	-
South Fork Water Board	-
Reduction based on existing use	-
Parks	**$100,871.78**
Oregon City	100,871.78
Reduction based on existing use	-
Total SDC and Agency Summary	**$405,675.95**
Oregon City	347,499.95
South Fork Water Board	-
Tri-City Sanitary District	58,176.00

Prepared by: R. Todd Mansur

City Engineer _____

Date: _____

OREGON CITY

Public Works

625 Center Street | Oregon City OR 97045
Ph (503) 657-0891 | Fax (503) 657-7892

Request for Estimate of Non-Residential System Development Charges

Instructions: Provide information about proposed project in boxes, including prior uses of property – if unsure of response, leave corresponding box blank.

Applicant

Name	Anna P. Thompson
Mailing address, line 1	25 Central Way, Suite 210
Mailing address, line 2	Kirkland, WA 98033
Telephone number (numbers only)	425-454-7130
E-mail address	apt@milbrandtarch.com
Building permit number/Planning File Number	PA 13-24
Circle type application type (see page 2 for definitions)	**New Development / Redevelopment / Incremental Development/ Tenant Improvement**
Existing SDC reduction or credit carry forward available? If YES, attach proof	NONE

Site

Site address, line 1	19896 Beavercreek Road
Site address, line 2	Oregon City, OR 97045
Map number (from property tax statement)	32E09D01400
Land area	9.7 ACRES
Zone	MUC 1

Proposed Use

Effective date of SDC estimate	7/9/13
Narrative description (optional)	Mixed use development to include apartments, shared living spaces, and work/live spaces
Proposed land use	MUC 1 – mixed residential/commercial
Building area in square feet	Unknown – 171 Apartments, 36 live/work townhomes
Proposed Size of water meter	unknown
How many seats? (restaurants, bars, taverns, etc.)	NA

Existing Use

Narrative description (optional)	SFR
Existing land use	SFR
Building area in square feet	unknown
Size of water meter	unknown
How many seats? (for restaurants, bars, taverns, etc.)	NA

Application Types	Definition of application type
Incremental Development	Additional construction on a developed lot whose existing structures will remain in place.
New Development	Development on a lot that has not been previously developed.
Redevelopment	Development on a lot that had been previously developed but whose previous structures have been removed.
Tenant Improvement	Construction by a tenant within an existing building.

Estimate Request by: Milbrandt Architects (Anna T.) Date: 7/9/2013
Estimate Due Date: for PA 13-24 meeting 7/9/13

Return completed form to:
Todd Martinez, 625 Center Street, Oregon City OR, 97045
tmartinez@orcity.org

For Internal Use:

SDC estimate provided	No SDC	Review of SDC credit pending

OREGON CITY

Public Works - Development Services

625 Center Street | Oregon City OR 97045
Ph (503) 657-0891 | Fax (503) 657-7892

CHARGES FOR WATER SERVICE CONNECTIONS

EFFECTIVE 1/2/13

Oregon City Resolution 04-21 (6/2/04)
South Fork Water Board Resolution 04-04 (12/1/04)

Size	Meter Installation Charge*	Meter Unit Equivalent	Oregon City SDC **	South Fork Water Board SDC ***	Total Fee
5/8" x 3/4"	$550	1	$3,374	$1,466	$5,390
3/4"	$600	1.5	$5,061	$2,199	$7,860
1"	$650	2.5	$8,435	$3,665	$12,750
1½ "	$2,298	5	$16,871	$7,329	$26,498
2"	$2,478	8	$26,993	$11,726	$41,197
3"	$3,030	16	$53,987	$23,452	$80,469
4"	$4,204	25	$84,355	$36,644	$125,203
6"	$6,695	50	$168,709	$73,290	$248,694
8"	$13,557	80	$269,935	$117,264	$400,756
10"	$18,696	115	$388,031	$168,566	$575,293

* Excludes service line installation

** OC applied their annual adjustment on 1/2/13 (+3.9%)

*** SFWB applied their annual adjustment on 1/2/13 (+3.9%)

NOTES:

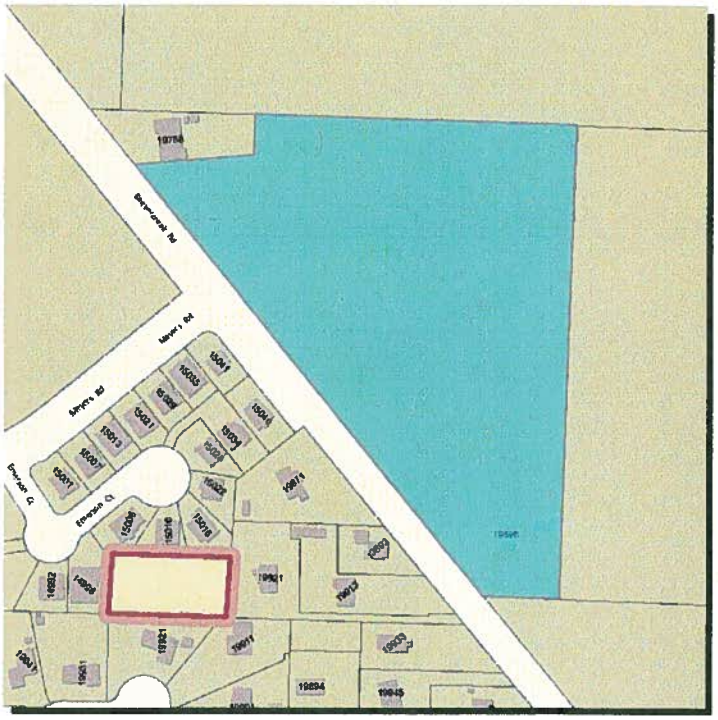
1. For residences required to use a 1" or 1½" meter for residential fire sprinklers, the City and SFWB SDCs for a 5/8 " meter shall be used. Oregon City SDC will be $3374 and SFWB SDC will be $1466 and Installation Charge will be as listed for the actual meter size used.
2. Irrigation meters will pay normal SDC based on size.

Invokes Res 04-21
SFWB Res 04-04/13-01

Taxlot Detail Report

Taxlot: 3-2E-10C -00800

Overview Map



Taxlot highlighted in blue

Taxlot Information

APN: 3-2E-10C -00800
Alt ID: 00870711
Site Address: 19896 BEAVERCREEK RD
OREGON CITY, OR 97045
Year Built: 1945

Taxpayer Information

Taxpayer: *Suppressed*
Address: *Suppressed*

Reference Information

Parcel Area (acres - approx): 9.7
Parcel Area (sq. ft. - approx): 423,403
Twn/Rng/Sec: 03S 02E 10
Tax Map Reference: 32E10C

Values

Mkt Values as of: 10/10/2012
Land Value (Mkt): $800,000
Building Value (Mkt): $1,500
Exempt Amount: $0
Net Value (Mkt): $801,500
Note: These are Market, NOT Assessed values.
Assessed Value: $224,097

Planning Designations

Zoning: MUC1
- Mixed Use Corridor District

Comprehensive Plan: muc
- Mixed Use - Corridor

Subdivision: NONE
PUD (if known):
Neighborhood Assn: Caufield NA
Urban Renewal District:
Historic District:
Historic Designated Structure? N
In Willamette Greenway? N
In Geologic Hazard? N
In Nat. Res. Overlay District (NROD)? N
In 1996 Floodplain? N

Report generated 5/14/2013 9:35 AM

City of Oregon City
PO Box 3040
625 Center St
Oregon City, OR 97045
(503) 657-0891
www.orcity.org

Oregon
John A. Kitzhaber, MD, Governor

Department of Transportation
Region 1 Headquarters
123 NW Flanders Street
Portland, Oregon 97209
(503) 731.8200
FAX (503) 731.8531

July 17, 2013

City of Oregon City
221 Molalla Ave, Suite 200
Oregon City, OR 97045

ODOT Case No: 5274

Subject: PA 13-24: Beavercreek Live/Work Pre-application conference

Attn: Pete Walter, Planner

We have reviewed the applicant's proposal to construct a combination of 3 and 4 apartment homes and live-work units. The site is in the vicinity of OR 213. ODOT has permitting authority for this facility[1] and an interest in ensuring that the proposed land use is compatible with its safe and efficient operation. To ensure compatibility with state standards and requirements, we request the City of Oregon City consider the following.

ODOT Issues and Requirements

ODOT requests that the City include ODOT in the scoping and review of any required traffic impact study (TIS). For the allowed use ODOT is primarily concerned with ensuring the safety and operations of state facilities. Prior to commencing the TIS, the applicant should contact Avi Tayar, P.E., ODOT Region 1 Traffic at 503.731.8221 to obtain ODOT concurrence with the scope of the study.

A zone change has recently been approved for this site and conditions of approval have been issued requiring proportional contribution towards a right turn at the OR 213/Meyers Rd intersection. If the applicant or City choose to revisit these conditions new Transportation Planning Rule (TPR) findings would be required. Generally, this requires a TIS comparing trip generation under the two zoning scenarios.

The analysis should present a comparison between the land use with the highest trip generation rate allowed outright under the proposed zoning/comp plan designation and the land use with the highest trip generation rate allowed outright under the existing zoning/comprehensive plan designation (this is commonly referred to as the "reasonable worst case" traffic analysis). It is important that the applicant's transportation engineer provide the City the opportunity to review and concur with the mix of land uses and square footage they propose to use for the "reasonable worst case" traffic analysis for both existing and proposed zoning prior to commencing the traffic analysis.

[1] OAR 734-051 website: http://arcweb.sos.state.or.us/rules/OARS_700/OAR_734/734_051.html

In this case the “reasonable worst case” land use scenario should be nearly identical to the “reasonable worst case” presented in the prior zone change’s TIS. In addition, alternative mobility standards have yet to be developed for zone changes. Therefore, the analysis would likely come to the similar conclusions and the same recommended conditions of approval for the zone change. ODOT does not recommend revisiting the zone change decision unless the applicant is seeking a different land use designation.

Thank you for providing ODOT the opportunity to participate in the pre-application conference and to comment on the proposal. If you have any questions regarding this matter, please contact me at 503.731.8234.

Sincerely,

Seth Brumley

Seth Brumley
Development Review Planner

C: Avi Tayar, P.E., ODOT Region 1 Traffic

Morgan Holen & Associates LLC
Consulting Arborists and Urban Forest Management
971.409.9354
3 Monroe Parkway, Suite P 220
Lake Oswego, Oregon 97035
morgan.holen@comcast.net

Beavercreek Road – Oregon City, Oregon
Arborist Report and Tree Plan
September 11, 2013

MHA1320

Purpose

This Arborist Report is the tree inventory, protection and mitigation plan for the Beavercreek Road project provided pursuant to City of Oregon City Municipal Code Chapter 17.41. This document describes the existing trees located on the project site, provides arborist recommendations for tree removal during construction, and explains the number of replacement trees required to be planted as mitigation for tree removal. This report is based on observations made by International Society of Arboriculture (ISA) Certified Arborist and Qualified Tree Risk Assessor Morgan Holen (PN-6145A) during a site visit conducted on August 2, 2013.

Scope of Work and Limitations

Morgan Holen & Associates, LLC, was contracted by Evergreen Housing to collect tree inventory data for individual trees measuring six inches and larger in diameter and to develop an arborist report and tree plan for the project. The site is planned for development including apartment buildings and parking lots. A site plan was provided by Evergreen Housing illustrating the location of existing trees and potential construction impacts.

Visual Tree Assessment (VTA) was performed on individual trees located across the site. The enclosed tree inventory data and site plan demonstrate that all trees on site were physically identified. VTA is the standard process developed by the ISA whereby the inspector visually assesses the tree from a distance and up close, looking for defect symptoms and evaluating overall condition and vitality of individual trees. Trees were evaluated in terms of general condition and potential construction impacts. Following the inventory fieldwork, we coordinated with Evergreen Housing to discuss treatment recommendations.

The client may choose to accept or disregard the recommendations contained herein, or seek additional advice. Neither this author nor Morgan Holen & Associates, LLC, have assumed any responsibility for liability associated with the trees on or adjacent to this site.

General Description

The Beavercreek Road project site is located at 19896 South Beavercreek Road in Oregon City, Oregon. The site is primarily a flat undeveloped field with one single family residence in the southern portion of the site which is planned for demolition. The existing trees are generally located around the house and appear to have been planted for landscaping purposes. However, two trees are located along the northern property boundary and these trees appear to be from natural regeneration.

Tree Inventory

A complete description of individual trees is provided in the enclosed tree inventory data. In all, 15 existing trees were inventoried on site including 11 tree species. Two species included on the City of Oregon City's Nuisance Plant List—cutleaf birch (*Betula pendula lacinata*) and English hawthorn (*Crataegus monogyna*)—were identified, accounting for three of the inventoried trees. The inventory also includes: two well-maintained fruit trees (*Malus* spp.); two bigleaf maples (*Acer macrophyllum*) that

have structural defects but appear in fair condition; one blue spruce (*Picea pungens*) and one Norway spruce (*Picea abies*) in generally fair condition; one Douglas-fir (*Pseudotsuga menziesii*) in good condition with no major defects; two Port-Orford-cedars (*Chamaecyparis lawsoniana*) in good condition, but with inherent species limitations including complete susceptibility to Port-Orford-cedar root disease caused by the fungus *Phytophthora lateralis*; one flowering cherry (*Prunus* spp.) tree in decline; one dead spruce (*Picea* spp.); and one Jeffrey pine (*Pinus jeffreyi*) with six codominant leaders attached to the main stem at just three feet above ground level with included bark and an increased probability for failure of one or more codominant leaders which presents a significant risk to people and property.

The enclosed tree inventory data includes a numerical condition rating assigned by the arborists to generally describe the condition of individual trees as follows:

1: Dead / Hazardous
2: Poor Condition
3: Fair Condition
4: Good Condition
5: Excellent Condition

None of the trees rated 5 for excellent condition. Table 1 provides a summary of the count of trees by species and condition rating.

Table 1. Count of Inventoried Trees by Species and Condition – Beavercreek Road Project.

Common Name	Species Name	Condition Rating				Total	%
		1	2	3	4		
apple	*Malus* spp.			2		2	13.33%
bigleaf maple	*Acer macrophyllum*			2		2	13.33%
blue spruce	*Picea pungens*			1		1	6.67%
cherry	*Prunus* spp.		1			1	6.67%
cutleaf birch	*Betula pendula lacinata*		2			2	13.33%
Douglas-fir	*Pseudotsuga menziesii*				1	1	6.67%
English hawthorn	*Crataegus monogyna*		1			1	6.67%
Jeffrey pine	*Pinus jeffreyi*	1				1	6.67%
Norway spruce	*Picea abies*			1		1	6.67%
Port-Orford-cedar	*Chamaecyparis lawsoniana*				2	2	13.33%
spruce	*Picea* spp.	1				1	6.67%
Total		**2**	**4**	**6**	**3**	**15**	**100%**
Percent of Total		**13%**	**27%**	**40%**	**20%**		

Tree Plan and Mitigation

City of Oregon City Municipal Code Chapter 17.41 intends to ensure that new development is designed in order to maximize tree preservation to the greatest extent feasible. Healthy trees located outside of the construction area—defined in section 17.04.230 as rights-of-way, public utility easements, and within the building footprint of a building site for any mixed-use, commercial or industrial development—must be preserved to the greatest extent possible. Unhealthy, hazardous trees and nuisance species are exempt from these regulations.

Nine of the 15 inventoried trees are healthy trees of regulated size, but removal of these trees is necessary for the purposes of site development; the locations of these trees do not allow for sufficient protection during construction. The remaining six trees are of regulated size, but three are invasive nuisance species in poor condition, one is an unhealthy and declining cherry in poor condition, one is a completely dead spruce, and one is a hazardous pine. Note that the hazardous condition of this tree is related to the natural structure of the tree and not the result of intentional action. All 15 trees are recommended for removal and are located within the construction area.

In addition, section 17.41.060 requires tree replacement for the removal of regulated healthy trees that are removed outside of the construction area at a ratio of 1 to 15 trees replanted for each tree removed depending on the size of the tree to be removed and whether or not that tree is located outside of or within the construction area. Replacement trees must be at least 2-inch caliper deciduous trees or 6-foot tall evergreens. Table 2 duplicates Table 17.41.060-1 from the Oregon City Municipal Code. Note that the number of replacement trees required on a development site must be calculated separately from, and in addition to, any required street trees per City of Oregon City Municipal Code section 12.08.

Table 2. Oregon City Tree Replacement Requirements (per OCMC Table 17.41.060-1).

Size of Tree Removed	Number of Tree to be Planted (If removed Outside of construction area)	Number of Tree to be Planted (If removed Within construction area)
6 to 12”	3	1
13 to 18”	6	2
19 to 24”	9	3
25 to 30”	12	4
31”+	15	5

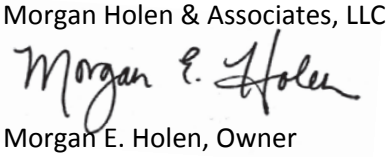
We coordinated with the project team to discuss site plans and grading requirements and to explore alternative construction techniques that might allow sufficient protection for existing healthy trees. All 15 trees are located within the construction area; nine trees are recommended for removal for the purposes of construction and six trees are recommended for removal because of poor or hazardous condition and for the purposes of construction.

The enclosed tree inventory data includes a column indicating the number of required mitigation trees. Replanting with 20 trees is required as mitigation for the removal of nine regulated healthy trees located within the construction area. We recommend replanting with a diverse mix of tree species in the proposed park and open space areas. Species recommendations may be provided upon request. The City’s Code also provides options for the applicant to plant mitigation trees off-site, make a cash payment in-lieu-of replanting, or some combination of replanting and cash payment in order to satisfy the mitigation requirements.

Since none of the existing trees are suitable for preservation with development, tree protection specifications are not provided. While it seems highly unlikely considering the proposed construction and required disturbance area, if any of the existing trees are required to be retained during construction please coordinate with us to provide recommendations for tree protection.

Please contact us if you have questions or need any additional information. Thank you for choosing Morgan Holen & Associates, LLC, to provide consulting arborist services for the Beavercreek Road project.

Thank you,
Morgan Holen & Associates, LLC



Morgan E. Holen, Owner
ISA Certified Arborist, PN-6145A
ISA Tree Risk Assessment Qualified
Forest Biologist

Enclosures: MHA1320 Beavercreek Road – Tree Inventory Data 8-2-13

No.	Common Name	Species Name	DBH[1]	C-Rad[2]	Cond[3]	Invasive Species	Comments	Treatment	Outside (O) or Within (W) Construction	Regulated Healthy Tree	Required Mitigation
101	bigleaf maple	*Acer macrophyllum*	10	12	3	no	codom stems, crown asymmetry	remove	W	yes	1
102	English hawthorn	*Crataegus monogyna*	8	12	2	yes	nuisance species; poor condition	remove	W	no	0
103	bigleaf maple	*Acer macrophyllum*	24	22	3	no	codom @ 4', some included bark	remove	W	yes	3
104	cutleaf birch	*Betula pendula lacinata*	19	20	2	yes	nuisance species; branch decay	remove	W	no	0
105	cutleaf birch	*Betula pendula lacinata*	21	20	2	yes	nuisance species; branch decay	remove	W	no	0
106	blue spruce	*Picea pungens*	18	15	3	no	sweep in upper crown	remove	W	yes	2
107	Norway spruce	*Picea abies*	24	12	3	no	new growth is dead	remove	W	yes	3
108	Port-Orford-cedar	*Chamaecyparis lawsoniana*	18	12	4	no	inherent species limitations	remove	W	yes	2
109	Port-Orford-cedar	*Chamaecyparis lawsoniana*	21	12	4	no	inherent species limitations	remove	W	yes	3
110	Douglas-fir	*Pseudotsuga menziesii*	29	26	4	no	no major defects	remove	W	yes	4
111	cherry	*Prunus* spp.	10	8	2	no	dead branches, progressive decline	remove	W	no	0
112	Jeffrey pine	*Pinus jeffreyi*	59	30	1	no	multiple leaders at 3' (6x24"), included bark, hazardous condition	remove	W	no	0
113	spruce	*Picea* spp.	28	n/a	1	no	dead	remove	W	no	0
114	apple	*Malus* spp.	10	12	3	no	some stem decay, but well maintained	remove	W	yes	1
115	apple	*Malus* spp.	10	12	3	no	well maintained fruit tree	remove	W	yes	1
Total Number of Mitigation Trees Required to be Planted (per Table 17.41.060-1):											**20**

[1]**DBH** is tree diameter measured at 4.5-feet above the ground level, in inches.

[2]**C-Rad** is the average crown radius measured in feet.

[3]**Cond** is an arborist assigned rating to generally describe the condition of individual trees as follows-

1: Dead / Hazardous
2: Poor Condition
3: Fair Condition
4: Good Condition
5: Excellent Condition

Consulting Arborists and Urban Forest Management
3 Monroe Parkway, Suite P220, Lake Oswego, OR 97035
morgan.holen@comcast.net | 971.409.9354

Oregon
John A. Kitzhaber, MD, Governor

Parks and Recreation Department
State Historic Preservation Office
725 Summer St NE, Ste C
Salem, OR 97301-1266
(503) 986-0690
Fax (503) 986-0793
www.oregonheritage.org

September 20, 2013

Ms. Kelly Moosbrugger
City of Oregon City Planning
PO Box 3040
Oregon City, OR 97045

RE: SHPO Case No. 13-1232
City of Oregon City Development Projs PA 13-23 through PA 13-27 and PA 13-31
FOE/new development
Oregon City Comm Dev
Multiple legals, Oregon City, Clackamas County

Dear Ms. Moosbrugger:

Our office recently received a request to review the proposal for the project referenced above. In checking our statewide cultural resource database, I find that there have been no previous cultural resource surveys completed near the proposed project area. However, the project area lies within an area generally perceived to have a high probability for possessing archaeological sites and/or buried human remains.

While not having sufficient knowledge to predict the likelihood of cultural resources being within your project area, extreme caution is recommended during future ground disturbing activities. ORS 358.905 and ORS 97.740 protect archaeological sites and objects and human remains on state public and private lands in Oregon. If any cultural material is discovered during construction activities, all work should cease immediately until a professional archaeologist can assess the discovery. If your project has a federal nexus (i.e., federal funding, permitting, or oversight) please coordinate with your federal agency representative to ensure that you are in compliance with Section 106 of the NHPA.

If you have any questions about my comments or would like additional information, please feel free to contact our office at your convenience. In order to help us track your project accurately, please be sure to reference the SHPO case number above in all correspondence.

Sincerely,

Matt Diederich, MAIS
SHPO Archaeologist
(503) 986-0577
Matthew.Diederich@state.or.us

Subject: RE: Tribal Notification per OCMC 17.62.040 H(2)
Date: Tuesday, November 19, 2013 1:22:04 PM Pacific Standard Time
From: Pete Walter
To: Andrew Brand

Andrew,

SHPO already commented on the pre-application. Attached is their standard letter. We did not receive any feedback from individual tribes.

Thanks,

Pete

-----Original Message-----
From: Andrew Brand [mailto:andrew@evergreenhd.com]
Sent: Tuesday, November 19, 2013 1:02 PM
To: Pete Walter
Subject: Re: Tribal Notification per OCMC 17.62.040 H(2)

Pete,

Did you have any follow-up on this?

Sincerely,
Andrew Brand

On 11/14/13 8:33 PM, "Andrew Brand" <andrew@evergreenhd.com> wrote:

> Pete,
>
> Thanks for checking on this.
>
> Did the City already send notification to the State Archeological
> representative per section 17.62.040 H(1) as well?
>
> Sincerely,
> Andrew Brand
> Director of Development
> Evergreen Housing Development Group, LLC
> 206-535-6248 x 101 Office
> 206-605-2173 - Cell
>
> On 11/14/13 11:23 AM, "Pete Walter" <pwalter@ci.oregon-city.or.us> wrote:
>
> > Andrew,
> >
> > I believe the city already did this. But I will check tomorrow and if
> > we have not, I'll send the notification.
> > Pete

Sent from my iPhone

On Nov 14, 2013, at 9:33 AM, "Andrew Brand" <andrew@evergreenhd.com<mailto:andrew@evergreenhd.com>> wrote:

Pete,

Can you confirm the requirement of the municipal code section 17.62.040 H(2)? It states that we should get an e-mail from the applicable tribal cultural resource representativeŠ Is there a specific representative/tribe we are to reach out to based on the area of our project? It's vague to me whether we are required to reach out to all the tribes, just a tribe or tribes closest to our site, or if this only applies to us if we are within a specifically designated tribal zone or area determined by the State Historic Preservation Office.

Sincerely,
Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
206-535-6248 x 101 Office
206-605-2173 - Cell

LIVE-WORK CONCEPTS
FOR THE MIXED-EMPLOYMENT VILLAGE
OF THE BEAVERCREEK ROAD CONCEPT PLAN

INTRODUCTION

Evergreen Housing Development Group is proposing a development at 19896 Beavercreek Road. This proposal includes a mix of residential uses with live-work units on the ground floors of certain buildings and in townhouse units that will be included as part of the development. The Oregon City Planning Department has requested more background information on the live-work concept to understand how live-work units will contribute to the goals of the Mixed-Employment Village portion of the Beavercreek Road Concept Plan.

Per the Beavercreek Road Concept Plan, the Mixed Employment Village (MEV) "allows a mix of retail, office, civic and residential uses that make up an attractive urban district and serve the daily needs of adjacent neighborhoods and Beavercreek Road sub-districts." The live-work concept proposed in the development application meets these criteria in a number of ways. A more detailed look at the goals of a live-work unit and some real life outcomes of live work units can clarify this concept.

WHAT IS A LIVE-WORK UNIT?

Live-work units are residential structures with commercial office and retail capabilities. Most codes where live-work units are formally adopted allow for the use of either IBC or IRC codes with provisions that the units have design features that will facilitate the use of the space for a home business. These design features can include easily convertible rooms to a business use and often have some separation from other rooms to maintain private residential spaces for the owner. These units often have exterior entrances allowing clients or the general public to enter the unit without having to first enter the resident's private space.

Live-work units serve multiple purposes.

- They foster a lively street environment and provide a natural surveillance of a neighborhood.
- They create flexible, affordable workplace options for small businesses looking to save money by consolidating a residential unit with a commercial unit. Affordability can also foster innovation. Less stress in finding affordable and practical work facilities provides more opportunity for small businesses to focus on business.

- They allow for a reduction in vehicle trips both by reducing the amount of commuting done by automobile and by allowing local residents of surrounding neighborhoods to easily access local community businesses.

WHO OCCUPIES A LIVE-WORK UNIT?

Small businesses tend to utilize live-work spaces. They include services such as (but not limited to) chiropractic, massage, pilates, yoga, psychological counseling, marriage counseling, student tutoring and testing. Professional services such as investment management, lawyers, accountants, bookkeepers, insurance, all frequently utilize live/work spaces. Other businesses include the full panoply of retail, service, and general office enterprises allowed by zoning.

Case studies of live-work residents show a diversity of business types all with the overarching desire to be an entrepreneur, connect to one's community and save money by combining the costs of home living and commercial space into one, often less expensive, payment.

A few actual businesses utilizing live-work spaces can be found at the following web pages:

www.mcconnellphoto.com
www.studiofitseattle.com
www.annrossmassage.com

Home page screenshots of the businesses above can be found in appendix A of this report.

IS THIS A NEW CONCEPT?

No. The live-work concept is actually a tried and true concept as old as the city itself. For many centuries, the small shopkeeper lived and raised a family above the store. Beginning as recently as the late 1940's, municipal zoning codes started to segregate commercial and residential uses. These changes in zoning created a separation of the physical locations of living and work, but were not necessarily an enhancement to everyday life in the community.

Recent changes to many zoning codes and building codes now allow for the live-work concept to be brought back to many locations. Our development site is one such place.

WHAT ARE SOME OF THE BENEFITS TO A LIVE-WORK CONCEPT?

- Eliminate the need to commute to work – less cars on the roads

- Provide natural surveillance on the street, enhancing public safety
- Providing a sense of variety along the streetscape and creating a strong neighborhood character and lively streetscape atmosphere.
- Providing affordability to small entrepreneurs and artists looking to stay in the local community.
- Fostering economic growth and diversity through the availability of affordable and flexible space.

WHAT DOES IT LOOK LIKE FROM THE STREET?

Live work units can take various forms depending on the local design requirements of a municipality and the market demands driving the build out and design of each unit. Typically, most live work units more closely resemble street front residential units with subtle cues that give them a more commercial feel. The best way to describe the look of the units is to show some real life examples of live-work units in action.

Issaquah Highlands is a master planned community in the City of Issaquah, Washington, a suburb of Seattle, WA. As part of the planning process the City and the master developers realized the importance for engaged street front environments but also recognized the economic limitations of dedicated ground floor commercial space in zones and neighborhoods that are not fully ready for more intense commercial uses often seen in core downtown areas of major cities. Live-work units became a key concept to the development of the community.

Some live-work spaces are utilized entirely as living spaces or as spaces where the type of business does not need to have street front advertising and some spaces choose to utilize signage to advertise their services. Examples of the street scapes where live-work units exist are below:

Notice the use of window details that serve to differentiate the street front commercial from a typical residential street front use.

Signage can be provided in limited forms to further demonstrate that this is commercial use, not just residential.

Separate doors to the work-space from the exterior define that this space is commercial and differentiated from the private residential space.

Function can fit within various types of form. These frontages have a more unified street front feeling even though the buildings have a vertical occupancy with each unit being a townhouse sharing one large gable roof.

Some live-work townhomes have distinct brownstone styles with walk up entrances to the private residential portion of the building and ground floor entrances for the commercial portion.

Signage in limited forms helps to define the street as a mixed-use commercial and residential environment.

HOW DOES LIVE-WORK FIT INTO ORGEON CITY'S FUTURE FOR BEAVERCREEK?

There are "10 Principals of Sustainable Community Design" noted on page 8 of the Beavercreek Road Concept Plan. The proposed project units complement the goals and the following principals:

- *#1 Mix Land Uses – Promote a mix of land uses that support living wage jobs and a variety of services.*
    - Live-work allows for full flexibility in the use of the space and entrepreneurial endeavors that foster small business growth, not minimum wage jobs.

- *#2 Housing Types – Create a range of housing choices for all ages and incomes.*
    - The project unit mix includes studio, one, two, three and five bedroom units. The five bedroom units will be especially attractive to students on very tight budgets. The studios through three bedroom units will meet the needs of a wide verity of households. The Live-work spaces create the type of dual use environment that allows for a number of users to save money while growing a business in a way that may otherwise not be achievable through a single use ground floor concept.

- *#3 Walk-ability – Make the Neighborhood "walkable" and make services "walk-to-able".*
    - Live-work spaces have their front doors on the sidewalk, promoting an active street environment centered on pedestrian use.
- *#4 Transportation – Provide a range of transportation options using a connected network of streets and paths.*
    - While not directly transportation, live-work units work best in a connected street grid that places importance on connectivity for cars, bikes and pedestrians.

- *#9 Green Buildings – Build compact innovative structures that use less energy and materials.*

    - Combining live and work environments reduces automobile use creating a healthier environment.

Live-Work Concepts for the Mixed Employment Village of the Beavercreek Road Concept Plan meets the following Goals and Objectives as laid out in the plan's Appendix 1 and are summarized in list form below.

Goal 1

Objective 1.1 – Allowing a variety of employment uses…
Objective 1.4 – Encourage neighborhood-oriented and scale mixed-use centers…
Objective 1.6 – Allow the integration of housing and employment uses where practicable.

Goal 2

Objective 2.1 - Allow a variety of employment uses…
Objective 2.3 – Encourage neighborhood-oriented and scaled mixed-use centers…
Objective 2.4 – Encourage environmentally responsible developments…

Goal 3

Objective 3.1 – Allow a variety of employment uses…
Objective 3.3 – Encourage neighborhood-oriented and scaled mixed-use centers…
Objective 3.4 – Allow the integration of housing and employment uses where practicable.

Goal 4

Objective 4.3 – Support locally based and founded employers that provide living wage jobs.

Goal 5

Objective 5.1 – Design the adjacent land-uses to Beavercreek Road in such a manner to ensure that the pedestrian experience is not diminished…
Objective 5.2 – Allow a variety of employment uses…

Goal 6

Objective 6.3 – Explore local and regional transit opportunities that will increase non-single occupancy vehicle travel.

Goal 8

Objective 8.1 – Allow a variety of employment uses…

Goal 9

Objective 9.3 – Allow a variety of employment uses…
Objective 9.5 – Encourage neighborhood-oriented and scaled mixed-use centers that provide goods, services and housing for local workers and residents of all ages and incomes.
Objective 9.6 – Allow the integration of housing and employment uses where practicable.

Finally, Alternative D of the Concept Plan shows this area as a "Live-Work" area.

Overall, there are many more Goals and Objectives that the proposed development will meet. This memo is just concentrating on the live-work aspects of the development.

SUMMARY

The live-work concept provides attractive street front units that enhance the neighborhood and have the capability to provide an active street experience by allowing for a wide variety of uses that will be flexible and accommodate the demands of the marketplace. As the remainder of the parcels in the Beavercreek Concept Plan area develop, these live-work units have the ability to easily change their use to best accommodate the needs and desires of the growing community.

Live-work units "provide employment opportunities in an urban, pedestrian friendly, and mixed-use setting."[1] The uses envisioned by live-work will "serve the daily needs of adjacent neighborhoods"[2] through the types of business shown to be started and maintained in live-work commercial spaces. In addition, these spaces can help alleviate some amount of traffic congestion at peak traffic hours by keeping commutes limited to a walk through a door in your home, instead of getting in one's car to drive to work.

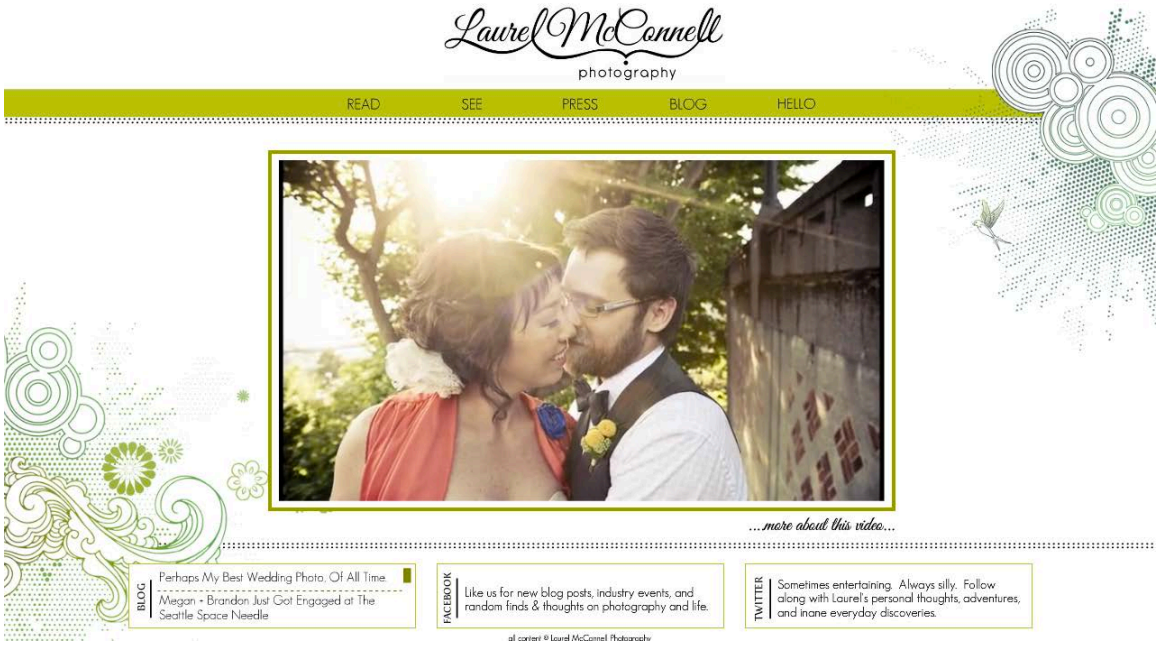
---

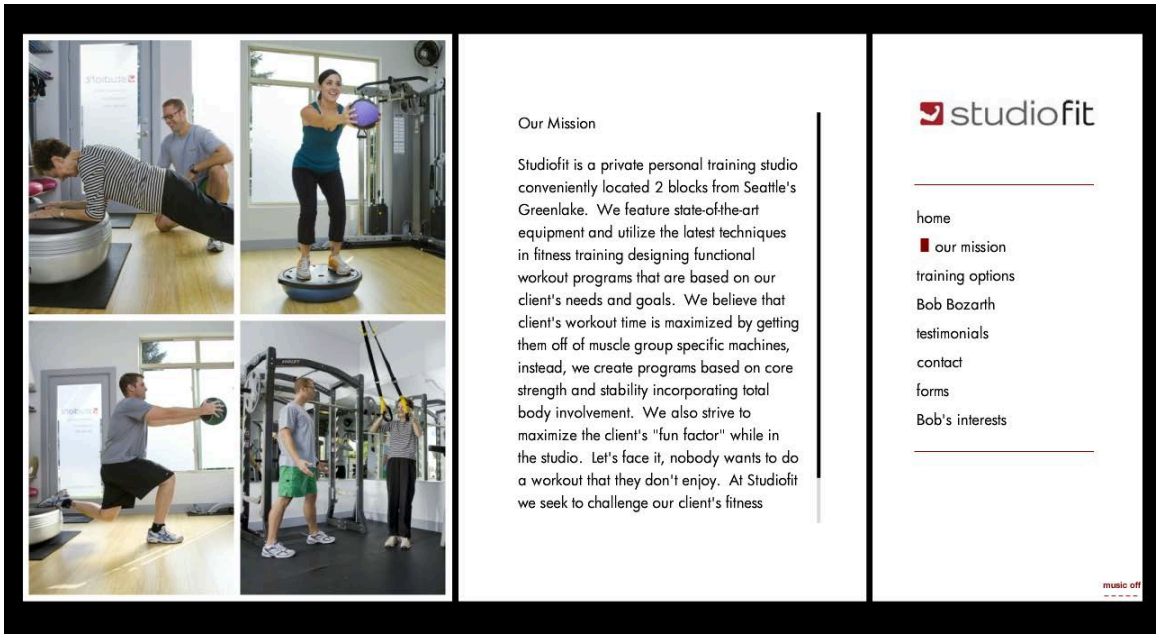
[1] Beavercreek Road Concept Plan, page 18

[2] Beavercreek Road Concept Plan, page 18

APPENDIX A

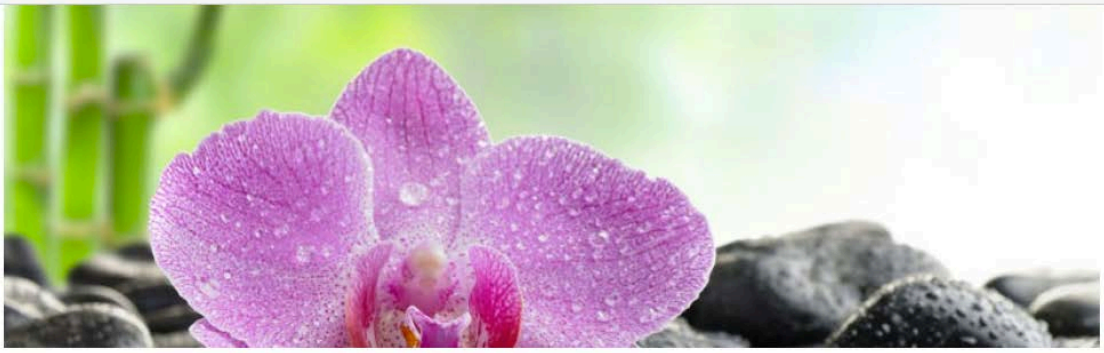
LIVE-WORK BUSINESSES





Ann Ross Massage Therapy

Seattle's Trusted Massage Therapist Since 2003



Seattle Massage Therapist, Ann Ross has been practicing since 2003 and has helped to improve the lives of her clients through her unique talents and educational accomplishments in the field of massage therapy.

For those seeking a massage therapist that is dependable, knowledgeable, down to earth, attentive and focused on the needs of her clients, Ann brings all of those qualities to her practice and more.

Her unique style of massage therapy has helped many recover from debilitating pain, overcome physical and emotional limitations, as well as bring a state of balance and health into the lives of those seeking a

booknow REAL-TIME

Follow Ann!

Read Verified Customer Reviews

★★★★★ Genbook

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

December 13, 2013 Project #: 13700

John Replinger, PE
City of Oregon City
221 Molalla Avenue, Suite 200
Oregon City, OR 97045

RE: Traffic Impact Analysis for the Beavercreek Mixed-Use Housing Development – Oregon City, OR

Dear John,

This letter presents the findings of the traffic impact analysis for the proposed Beavercreek Road Mixed-Use Housing Development in Oregon City, Oregon.

Evergreen Housing Development Group, LLC is proposing to develop a mixed-use housing development located east of Beavercreek Road directly across from the Oregon City High School, between S Loder Road and S Glen Oak Road in Oregon City, Oregon. A zone change for this property was prepared in 2010 in which the site was successfully rezoned from *Future Urban* to *Mixed-Use Corridor* (MUC-1) zoning[1]. As such, the proposed development is in compliance with the current zoning of the site. The development proposal includes a total of 183 residential housing units, of which 36 units will be mixed-use live/work townhomes. Additional detail of the proposed development plan is provided later in this report. For the purposes of this traffic analysis, the development is assumed to be built out and occupied by year 2016.

This study concludes that the residential mixed-use development can be constructed while maintaining acceptable traffic operations at the study intersections along OR 213, Beavercreek Road, and the site access. The remainder of this memorandum provides further documentation of the study methodology, findings, and recommendations. A table of contents, list of figures, and list of tables is provided on the next page.

[1] Property also identified as T3S-R2E-10C, tax lot 800

TABLE OF CONTENTS

Executive Summary 3
Findings 3
Recommendations 4
Introduction 5
Scope of the Report 5
Existing Conditions 8
Site Conditions and Adjacent Land Uses 8
Roadway Facilities 8
Pedestrian and Bicycle Facilities 9
Crash Data Review 9
Transit Facilities 12
Traffic Volumes and Peak Hour Operations 12
Current Level of Service 12
Transportation Impact Analysis 15
Planned Developments and Transportation Improvements 15
Regional Background Traffic Growth 15
2016 Background Traffic Operations 17
Proposed Development Plan 17
Year 2016 Total Traffic Conditions 19
Other Considerations 21
Meyer Road Extension 2027 Horizon Year Analysis 21
Preliminary Sight Distance Verification 23
Conclusion 24

LIST OF FIGURES

Figure 1 Site Vicinity Map 6
Figure 2 Conceptual Site Plan 7
Figure 3 Existing Lane Configurations and Traffic Control Devices 11
Figure 4 Existing Traffic Operations 13
Figure 5 Year 2016 Background Traffic Operations 16
Figure 6 Estimated Trip Distribution Pattern and Site-Generated Trips 18
Figure 7 Year 2016 Total Traffic Operations 20

LIST OF TABLES

Table 1 Existing Transportation Facilities and Roadway Designations 8
Table 2 Crash Data Summary (January 2008 – December 2012) 9
Table 3 Summary of Intersection Performance Standards 14
Table 4 Estimated Trip Generation 17
Table 5 Year 2027 Total Volumes at the Beavercreek Road/Meyers Road Intersection 22
Table 6 Year 2027 Total Traffic Conditions, Weekday PM Peak Hour 22

EXECUTIVE SUMMARY

This study concludes that the residential mixed-use development can be constructed while maintaining acceptable traffic operations at the study intersections along OR 213, Beavercreek Road, and the site access.

Findings

Existing Traffic Operations

- All of the study intersections operate at acceptable levels of service during the weekday a.m. and p.m. peak hours, except the Beavercreek Road/Loder Road intersection. During the weekday a.m. peak hour, this intersection operates at LOS F for the westbound approach.
- Preliminary sight distance measurements indicate that adequate intersection and stopping sight distance is currently available.
- No crash patterns were identified that warrant mitigation recommendations as a result of the traffic impacts of the proposed development.

Proposed Development Plan

- The proposed development includes construction of 183 residential rental units and approximately 378 parking spaces.
- The proposed development is estimated to generate approximately 69 weekday a.m. (22 in / 47 out) and 83 weekday p.m. (46 in / 37 out) peak hour trips.

Year 2016 Total Traffic Operations

- All of the study intersections except the Beavercreek Road/Loder Road intersection are forecast to continue to operate within acceptable levels of service during the weekday a.m. and p.m. peak hours.
- Sufficient sight distance is expected to be available at the site-access upon buildout.

Year 2027 Meyers Road Extension Analysis

- The site traffic impacts are forecast **not** to have a *significant effect*[2] on the long term operations of the future Meyers Road/OR 213 intersection. No capacity-based mitigations are recommended.

Recommendations

The following list summarizes the mitigation measures recommended as part of this proposed development.

- The site access should be designed to accommodate a separate left-turn and a shared through-right lane to exit the site (westbound direction). This is consistent with the Beavercreek Road Concept Plan and the 2013 Transportation System Plan Update for a residential minor arterial.
- No capacity-based mitigation is recommended at the Beavercreek Road/Loder Road intersection as a result of the proposed development traffic impacts.
- No safety-based mitigations are recommended as a result of the proposed development traffic impacts.
- Site-development related landscaping as well as above-ground utilities or signing near the site access points should be located and maintained to ensure adequate sight distance is provided upon buildout.

[2] *Significant effect* defined as an impact on the overall intersection volume-to-capacity ratio of greater than 0.01.

INTRODUCTION

Evergreen Housing Development Group, LLC is proposing to develop a mixed-use housing development located east of Beavercreek Road directly across from the Oregon City High School, between S Loder Road and S Glen Oak Road in Oregon City, Oregon. The proposed development is in compliance with the current zoning of the site and includes 183 residential housing units, of which 36 units will be mixed-use live/work townhomes. Figure 1 illustrates the site vicinity and Figure 2 illustrates the proposed development plan. Figure 2 is preliminary in nature (showing only 177 units) and will be updated to reflect the 183 units analyzed in this report as well as the recommended driveway egress geometry.

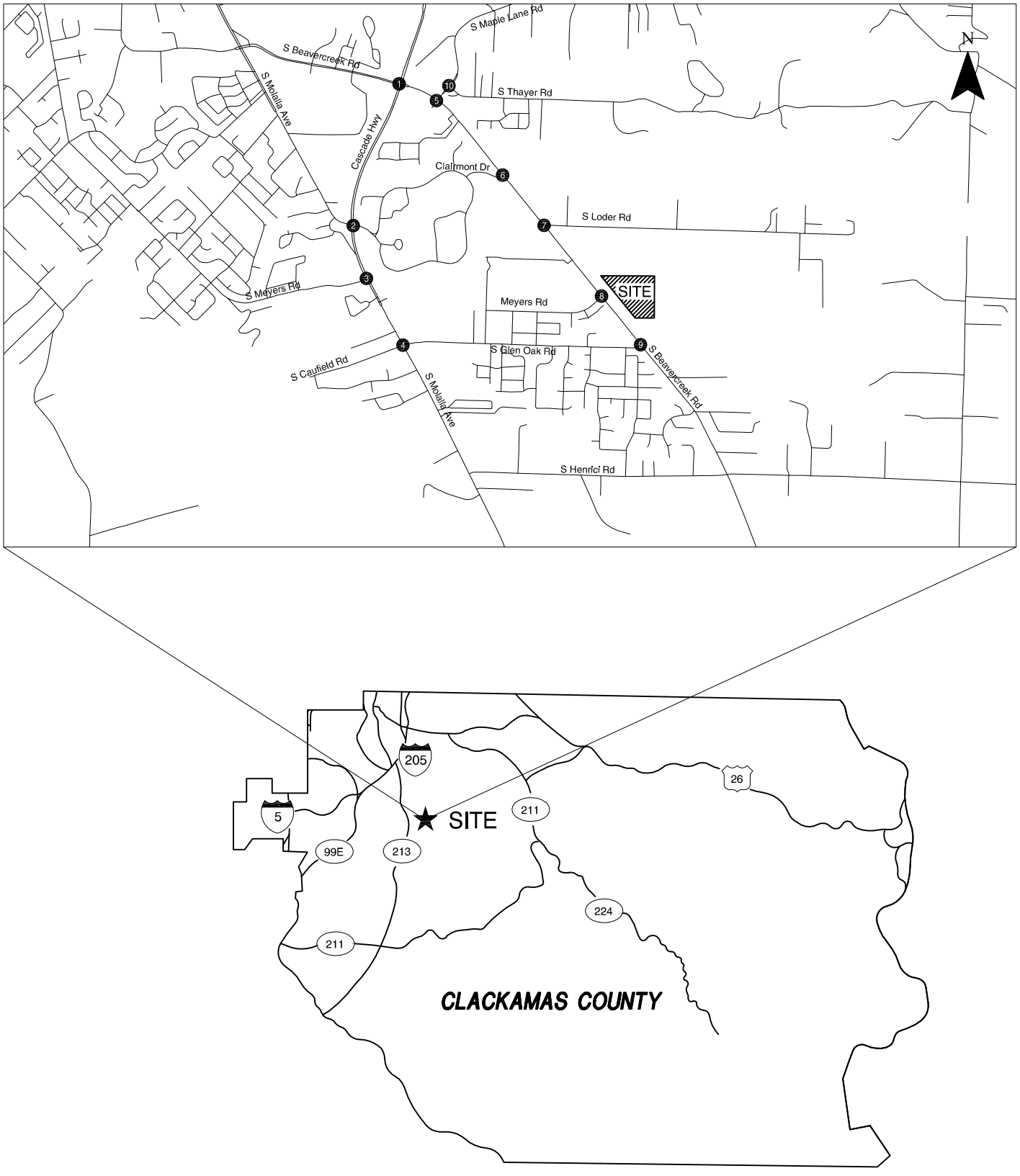
Scope of the Report

This analysis documents the expected transportation-related impacts associated with the proposed development and has been prepared with City of Oregon City direction for a traffic impact analysis. The study intersections and scope of this project were based on consultation with City staff as well as the *2010 Beavercreek Road/Meyers Road Rezone TPR Analysis* (Reference 1). Operational analyses were conducted at the following ten intersections.

- OR 213/Beavercreek Road
- OR 213/Molalla Avenue (Douglas Loop)
- OR 213/Meyers Road
- OR 213/Glen Oak Drive
- Maple Lane Road/Thayer Drive
- Beavercreek Road/Maple Lane Road
- Beavercreek Road/Claymont Drive
- Beavercreek Road/Loder Road
- Beavercreek Road/Meyers Road
- Beavercreek Road/Glen Oak Drive

This report evaluates the following transportation issues:

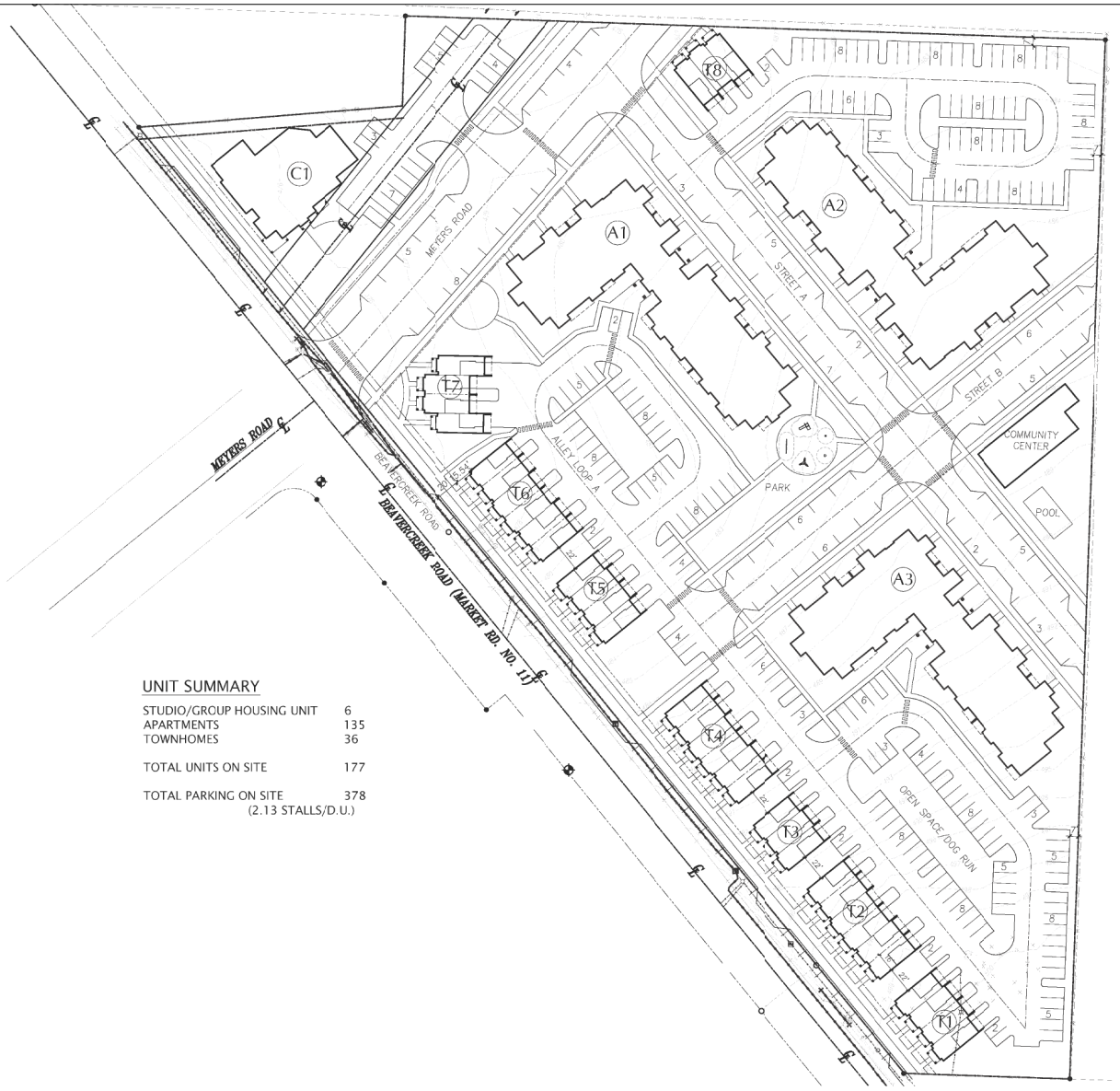
- Year 2013 existing transportation system conditions within the site vicinity during the weekday a.m. and p.m. peak periods;
- Forecast year 2016 background traffic conditions during the weekday a.m. and p.m. peak periods without build-out of the site;
- Trip generation estimates and distribution for the proposed development;
- Forecast year 2016 total traffic conditions during the weekday a.m. and p.m. peak periods with build-out of the site;
- Horizon year 2027 background (no site traffic) and total (includes site traffic) transportation system conditions for the OR 213/Meyers Road intersection during the weekday p.m. peak hour, assuming Meyers Road is completed between OR 213 and Beavercreek Road.



SITE VICINITY MAP
OREGON CITY, OREGON

Figure
1

H:\projfile\13700 - Evergreen Beavercreek Mixed Use Housing\dwgs\figs\13700_Fig01.dwg Dec 03, 2013 - 1:25pm - darguea Layout Tab: FIG01



SITE PLAN PROVIDED BY MILBRANDT ARCHITECTS ON NOVEMBER 8, 2013

CONCEPTUAL SITE PLAN
OREGON CITY, OREGON

Figure 2

H:\projfile\13700 - Evergreen Beavercreek Mixed Use Housing\dwgs\figs\13700_Fig01.dwg Dec 03, 2013 - 1:25pm - darguea Layout Tab: FIG02

EXISTING CONDITIONS

The existing conditions analysis identifies the site conditions and current operational and geometric characteristics of roadways within the study area. These conditions will be compared with future conditions later in this report.

The proposed development site and surrounding study area was inventoried in October 2013. At that time, information was collected regarding site conditions, adjacent land uses, existing traffic operations, and transportation facilities in the study area.

Site Conditions and Adjacent Land Uses

The site is located directly east of the Beavercreek Road/Meyers Road intersection, and a fourth leg of the intersection will be constructed as part of the development to provide full access into the site. The parcel of land is approximately 9.7 acres and currently has one single-family residence on the site. The site is appropriately zoned *Mixed-Use Corridor* (MUC-1) and no change to the existing zoning is proposed. Oregon City High School is located to the west on the opposite side of Beavercreek Road, and developed residential neighborhoods are located south of the school. Rural land uses currently exist east of the study site, along with wetland and sensitive lands associated with the Thimble Creek Tributary. Access to the site is proposed via the Beavercreek Road/Meyers Road intersection.

Roadway Facilities

As illustrated in Figure 2, Beavercreek Road borders the site to the west, and the future eastern extension of Meyers Road will bisect the site. Table 1 summarizes the primary roadways within the study area.

Table 1 Existing Transportation Facilities and Roadway Designations

Roadway	Functional Classification	Number of Lanes	Posted Speed (miles per hour)	Sidewalks	Bicycle Lanes	On-Street Parking
Oregon 213	District Highway/Expressway	3-5 Lanes	45	Partial[1]	Yes	No
Beavercreek Road	Major Arterial	2-5 Lanes	35-451	Partial[1]	Partial	No
Molalla Avenue	Major Arterial	3-Lanes	35	Yes	Yes	No
Meyers Road	Collector	3-Lanes	30	Yes	Yes	Yes
Henrici Road	Not classified	2-Lanes	40	No	No	No
Glen Oak Road	Collector	2-Lanes	35	Partial[2]	No	No
Loder Road	Not classified	2-Lanes	25	No	No	No

[1] Beavercreek Road is posted with a 35 mph speed limit between OR 213 and Clairmont Drive and transitions to 45 mph south of Clairmont Drive. A 20 mph school zone is posted along the roadway near the Oregon City High School.

[2] Roadway infrastructure generally exists where frontage improvements have been provided.

Figure 3 illustrates the existing lane configurations and traffic control devices in place at the study intersections.

Pedestrian and Bicycle Facilities

Sidewalks and bicycle lanes are currently provided within the northern portion of the study area where frontage improvements have been completed. There are missing sidewalk and bicycle lane segments along many of the surrounding roadways. Plans for the study area roadways anticipate completion of sidewalk segments as part of future private development and roadway enhancement projects, as well as provision of bicycle lanes in conjunction with roadway upgrades to serve the anticipated urban development. Pedestrian and bicycle facilities are generally not available in the southern portion of the study area.

Crash Data Review

The most recent five years of available crash data at each of the study intersections was provided by the Oregon Department of Transportation (ODOT). The review of intersection crash data does not reveal any safety issues or patterns within the vicinity of the proposed site access. As such, no safety-based mitigation measures were identified as a result of the proposed development. The crash data is summarized in Table 2 below.

Table 2 Crash Data Summary (January 2008 – December 2012)

Intersection	5 Year MEV[1]	Crash Type							Severity			Total Crashes	Crash Rate (per MEV)
		Angle	Turn	Rear End	Head On	Fixed Object	Ped /Bike	Other	PDO[2]	Injury	Fatality		
OR 213/ Beavercreek Rd	101.7	7	10	81	0	1	1	0	40	59	1	100	0.98
OR 213/ Molalla Ave	54.9	1	5	15	0	1	1	1	11	12	1	24	0.44
OR 213/ Meyers Rd	51.1	0	1	19	0	1	0	0	9	12	0	21	0.41
OR 213/ Caufield Rd	44.2	0	1	4	0	1	0	0	2	4	0	6	0.14
Maple Lane Rd/ Beavercreek Rd	51.3	3	5	3	0	0	1	0	5	7	0	12	0.23
Beavercreek Rd/ Clairmont Dr	29.9	0	0	0	0	0	0	0	0	0	0	0	0.00
Beavercreek Rd/ Loder Rd	28.2	0	0	0	0	0	0	0	0	0	0	0	0.00
Beavercreek Rd/ Meyers Rd	26.9	0	0	1	0	0	0	0	0	1	0	1	0.04
Beavercreek Rd/ Glen Oak Rd	23.4	0	3	0	0	0	0	0	2	1	0	3	0.13
Beavercreek Rd/ Thayer Rd	19.0	0	2	0	0	0	1	0	1	2	0	3	0.16

[1] MEV: million entering vehicles
[2] PDO: property damage only

OR 213/Beavercreek Road

As shown in Table 2, over the five-year period there were 100 crashes reported at the OR 213/Beavercreek Road intersection, and 81 of these were rear-end collisions. Of the 81 rear-end collisions, 40 crashes occurred on the east leg of Beavercreek Road (westbound vehicles), 17 involved southbound vehicles, 18 northbound vehicles, and 6 involved eastbound vehicles. Rear-end crashes at this intersection have generally increased over the 5 year period with 3, 9, 20, 25, 24 crashes occurring each year from 2008-2012, in the respective order. Per conversations with ODOT staff, this intersection has been identified as a top five percent safety priority intersection by the 2012 Traffic Safety Priority Index System (SPIS)[3].

While there are currently no short-term or long-term plans for safety improvements at the intersection in the 2013 Oregon City Transportation System Plan, there is a planned operational improvement to extend the dual eastbound left-turn lanes by 200 feet in the next 5 years.

OR 213/Molalla Avenue

There were 24 crashes reported at the OR 213/Molalla Avenue intersection over the five-year period, of which 15 were rear-end collisions. The 15 rear-end collisions were evenly distributed between the 4 legs of the intersection, and with the exception of 2008 in which there were no reported rear-end crashes, there was no significant increase or decrease in rear-end collisions over the time period.

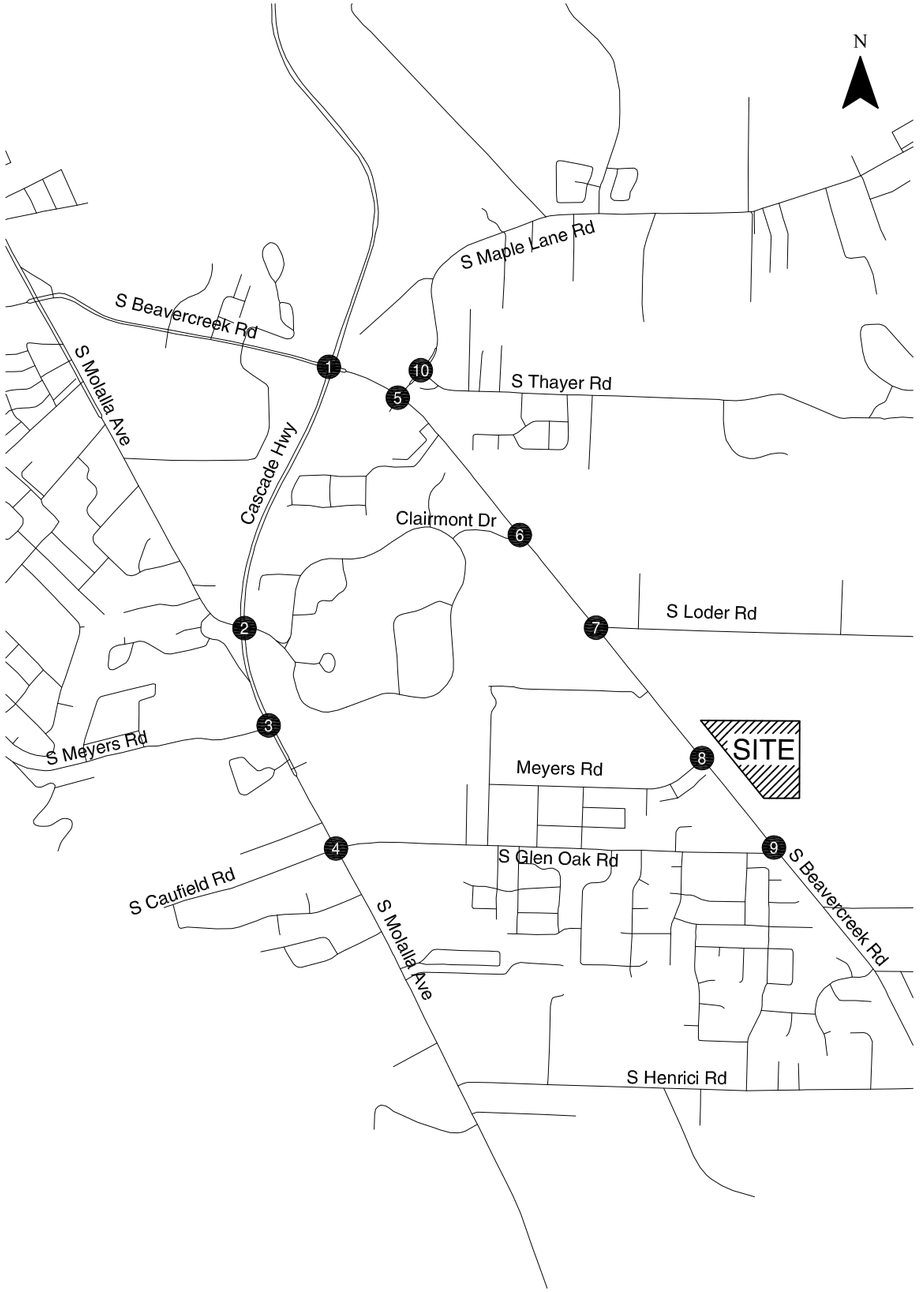
OR 213/Meyers Road

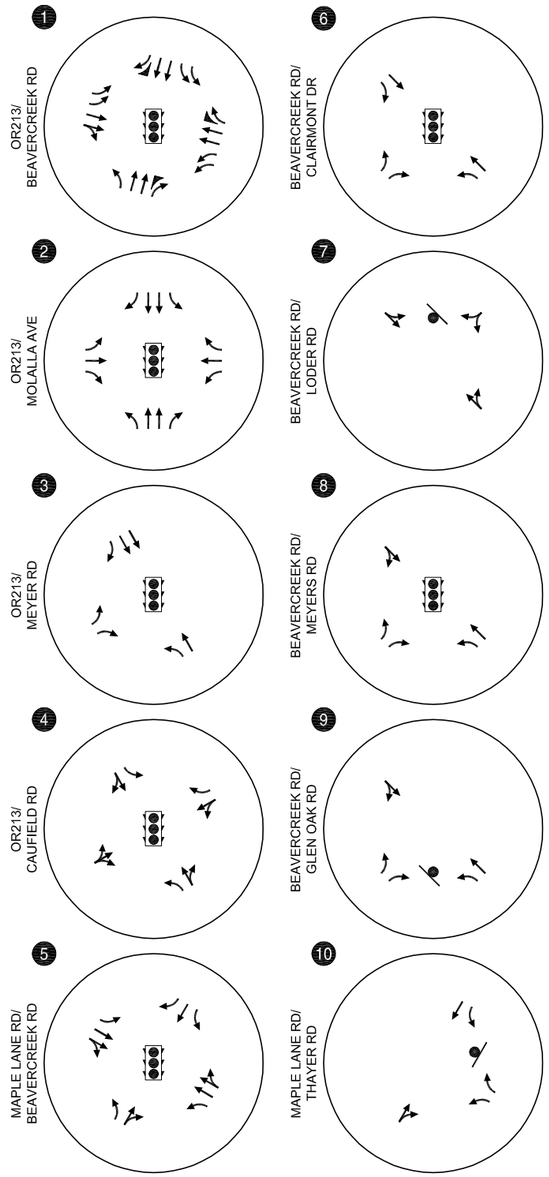
There were 21 crashes reported at the OR 213/Meyers Road intersection over the five-year period, of which 19 were rear-end collisions. Of 19 rear-end collisions, 15 occurred in the south leg of the intersection with northbound vehicles. While there were no rear-end collisions reported in 2008, the years between 2009-2012 experienced 3, 6, 7, and 3 crashes for each year.

Beavercreek Road/Meyers Road

At the proposed location of the site access for the development, one crash was reported at the Beavercreek Road/Meyers Road intersection over the five-year period. With the development of the fourth leg of the intersection, it is recommended that adequate sight distance (discussed in more detail later in the report) is provided and that any foliage or shrubbery be maintained to ensure that sight distance continues to be provided. Based on the existing available sight distance and low number of reported crashes, no safety-based mitigation measures were identified as a result of the proposed development.

[3] The SPIS is a method developed by ODOT for identifying hazardous locations on state highways through consideration of crash frequency, crash rate, and crash severity.





- Stop Sign
- Traffic Signal

EXISTING LANE CONFIGURATIONS & TRAFFIC CONTROL DEVICES
OREGON CITY, OREGON

Figure 3

Within the immediate site vicinity, sidewalks and bicycle lanes are provided on Meyers Road west of Beavercreek Road and along the Oregon City High School site frontage. No sidewalks are provided along the study site frontage or the properties to the north and south of it, though a northbound bicycle lane is provided along Beavercreek Road.

Transit Facilities

No fixed route transit service is currently provided along Beavercreek Road to the site. The nearest transit service is located at Clackamas Community College (CCC) to the north and west of the site. TriMet provides three transit routes to the college (Reference 2). These routes are Route 32: *Oatfield*; Route 33: *McLoughlin*; and, Route 99: *McLoughlin Express*, all of which begin or end their routes at the campus. Each transit line provides service between CCC and downtown Portland, and includes scheduled stops at the Oregon City Transit Center and Milwaukie Transit Center.

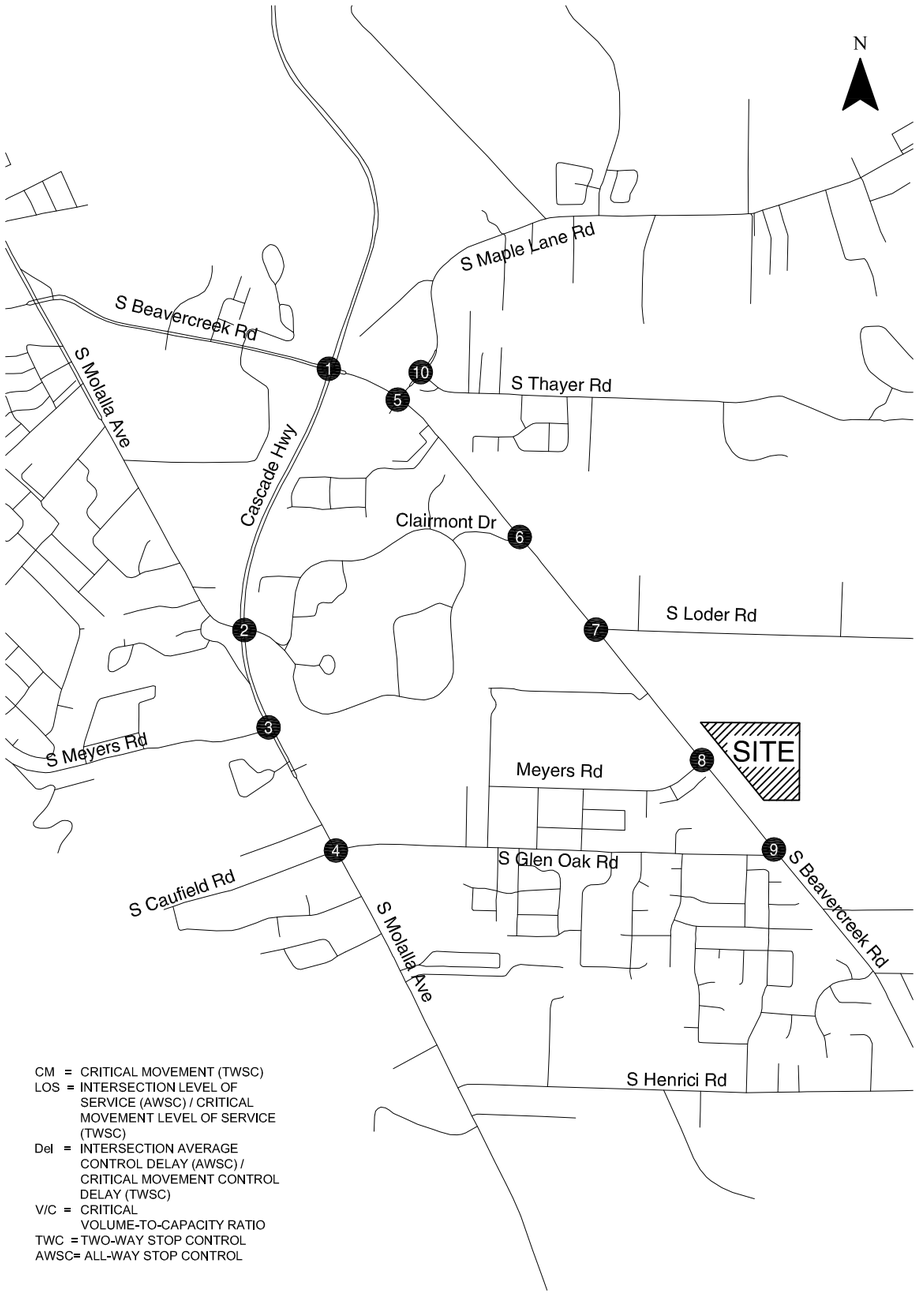
Traffic Volumes and Peak Hour Operations

Manual turning movement counts were obtained for all existing study intersections in October 2013. All counts used in this analysis were conducted on a typical weekday during the morning (7:00 to 9:00 a.m.) and afternoon (4:00 to 6:00 p.m.) peak travel periods. The system-wide morning and evening peak hours were found to occur between 7:00 and 8:00 a.m. and between 5:00 and 6:00 p.m., respectively. Per ODOT requirement for analysis, the existing traffic volumes along OR 213 were seasonally adjusted to the 30th Highest hour Volume (30 HV) consistent with the methodology provided in the *Analysis Procedures Manual* (Reference 3) to arrive at the analysis volumes in this report. Figure 4 provides a summary of the seasonally adjusted year 2013 turning movement counts, which are rounded to the nearest five vehicles per hour for the weekday a.m. and p.m. peak hours. *Attachment "A" contains the traffic count worksheets used in this study.*

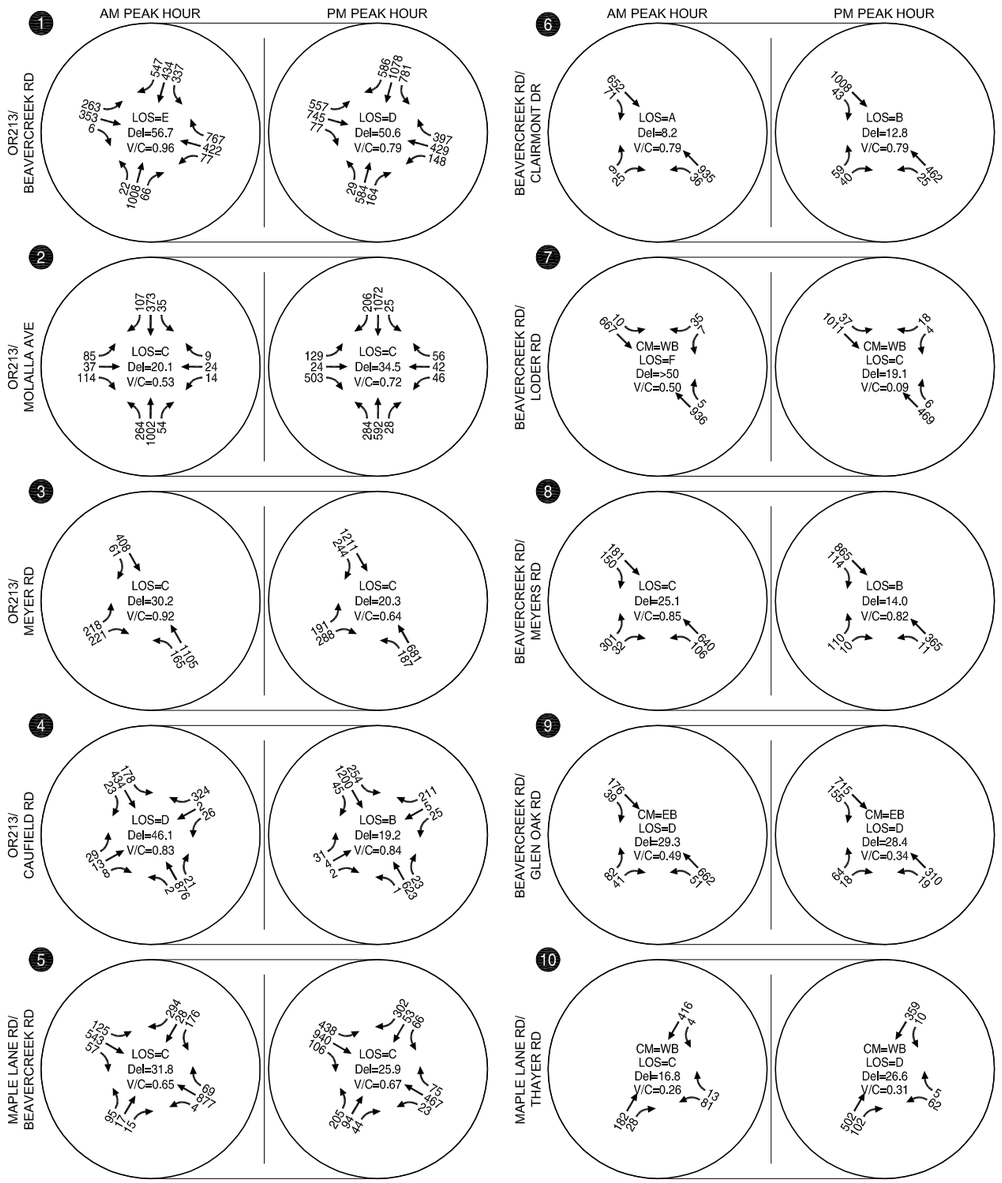
Current Level of Service

All level-of-service analyses described in this report were performed in accordance with the procedures stated in the 2000 *Highway Capacity Manual* (Reference 4). *A description of level of service and the criteria by which they are determined is presented in Attachment "B".* Attachment "B" also indicates how level of service is measured and what is generally considered the acceptable range of level of service.

All intersection level-of-service evaluations used the peak 15-minute flow rate during the weekday a.m. and p.m. peak hours. Using the peak 15-minute flow rate ensures that this analysis is based on a reasonable worst-case scenario. For this reason, the analysis reflects conditions that are only likely to occur for 15 minutes out of each average peak hour. The transportation system will likely operate under conditions better than those described in this report during all other time periods.



CM = CRITICAL MOVEMENT (TWSC)
LOS = INTERSECTION LEVEL OF SERVICE (AWSC) / CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
Del = INTERSECTION AVERAGE CONTROL DELAY (AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
TWC = TWO-WAY STOP CONTROL
AWSC= ALL-WAY STOP CONTROL



EXISTING TRAFFIC OPERATIONS
WEEKDAY AM & PM PEAK HOURS
OREGON CITY, OREGON

Figure 4

Figure 4 summarizes the level-of-service analysis for the study intersections under the weekday a.m. and p.m. peak hour existing traffic conditions. Intersection performance thresholds vary throughout the study area based on the roadway jurisdiction. Oregon City performance requirements are included within the City's Transportation System Plan (TSP, Reference 5), and identify that a Level of Service (LOS) "D" or higher should be maintained at all signalized intersections along with a volume-to-capacity (V/C) ratio less than 1.0, and Level of Service "E" or better be maintained at unsignalized intersections[4]. ODOT mobility standards included within the *Oregon Highway Plan* (Reference 6) require a volume-to-capacity ratio of less than 0.99 along OR 213 during the 30th highest design hour.

Table 3 presents a summary of the study area intersections, roadway jurisdiction, and relevant performance standards.

Table 3 Summary of Intersection Performance Standards

Intersection	Roadway Jurisdiction	Traffic Control	Performance Standard
OR 213/ Beavercreek Road	ODOT	Signalized	V/C < 0.99
OR 213/ Molalla Avenue	ODOT	Signalized	V/C < 0.99
OR 213/ Meyers Road	ODOT	Signalized	V/C < 0.99
OR 213/ Glen Oak Road	ODOT	Signalized	V/C < 0.99
Thayer Road/ Maple Lane Road	City of Oregon City	Two-Way Stop-Control	LOS E
Beavercreek Road/ Maplelane Road	City of Oregon City	Signalized	LOS D/ V/C < 1.0
Beavercreek Road/ Clairmont Drive	City of Oregon City	Signalized	LOS D/ V/C < 1.0
Beavercreek Road/ Loder Road	City of Oregon City	Two-Way Stop-Control	LOS E
Beavercreek Road/ Meyers Road	City of Oregon City	Signalized	LOS D/ V/C < 1.0
Beavercreek Road/ Glen Oak Road	City of Oregon City	Two-Way Stop-Control	LOS E
Beavercreek Road/ Henrici Road	City of Oregon City	Signalized	LOS D/ V/C < 1.0

V/C: Volume-to-Capacity Ratio
LOS: level of service

As shown in Figure 4, all intersections operate within acceptable operations thresholds during the weekday a.m. and p.m. peak hours except the Beavercreek Road/Loder Road intersection. During the weekday a.m. peak hour, this intersection operates at LOS F for the westbound approach. *Attachment "D" includes the level-of-service worksheets under year 2013 existing traffic conditions and the field-observed saturation flow rates at the Beavercreek Road/OR 213 intersection.*

[4] Oregon City standards allow Level of Service "E" or better for the poorest operating approach at unsignalized intersections. If the critical movement serves 20 or fewer peak hour trips, a Level of Service "F." is acceptable.

TRANSPORTATION IMPACT ANALYSIS

The transportation impact analysis identifies how the study area's transportation system will operate with buildout of the proposed development. The impact of traffic generated by the proposed development during the typical weekday a.m. and p.m. peak hours was examined as follows:

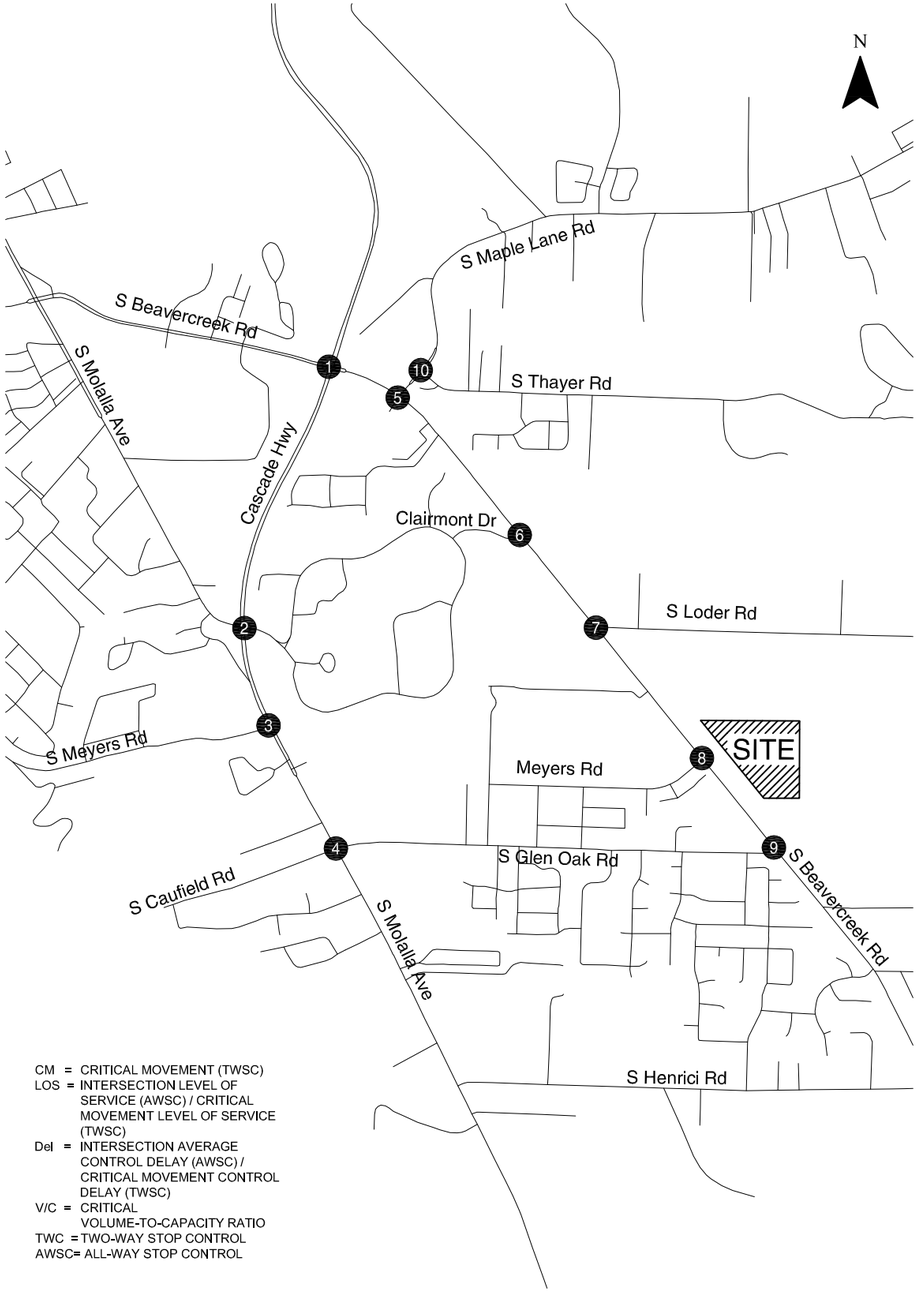
- Planned developments and transportation improvements planned in the site vicinity were identified;
- Year 2016 (build-out year) background traffic conditions (no site traffic) were analyzed at each of the study intersections and site-access points during the weekday a.m. and p.m. peak hours;
- Site-generated trips were estimated for build-out of the site;
- Site trip-distribution patterns were determined based on a review of the existing transportation network and the nature of the proposed development;
- Year 2016 (build-out year) total traffic conditions (with site traffic) were analyzed at each of the study intersections and site-access points during the weekday a.m. and p.m. peak hours;
- Year 2027 horizon year traffic conditions were analyzed at the OR 213/Meyers Road intersection; and,
- Sight distance was reviewed.

Planned Developments and Transportation Improvements

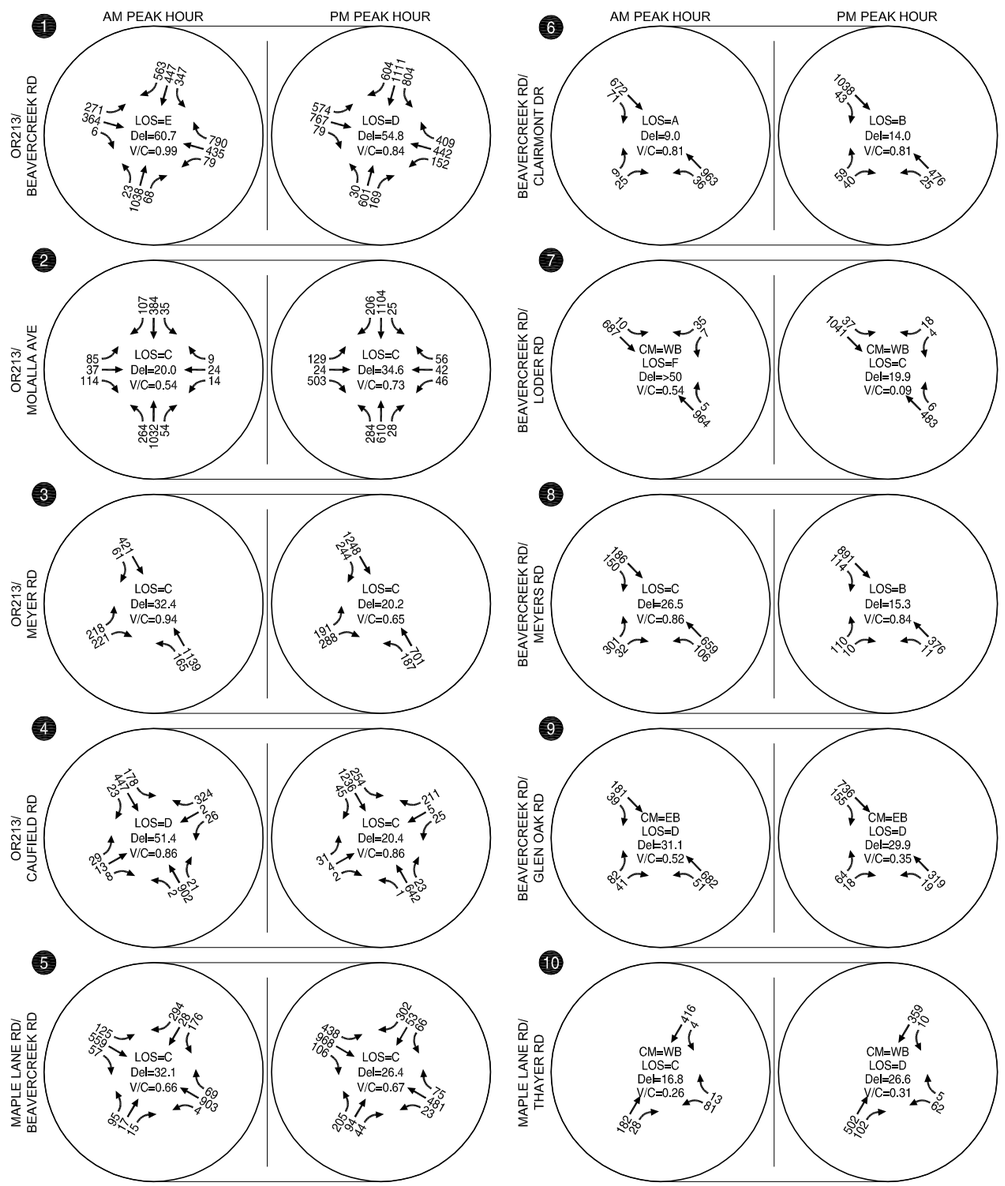
City of Oregon City staff was contacted to identify any in-process developments or transportation improvements that may affect the roadway network in the vicinity of the proposed project. No projects were identified to occur before the buildout year of the proposed development.

Regional Background Traffic Growth

This analysis considers the impact of the proposed development's site-generated trips on the roadway network using future year (2016) traffic volumes. Background traffic growth was developed for both OR 213 and Beavercreek Road per direction from City of Oregon City staff and historical traffic volumes. A review of the recently adopted 2013 TSP (Reference 5) and conversations with City staff confirmed a one-percent annual growth rate for regional growth. This rate was applied to all through and turning movements at the Beavercreek Road/OR 213 intersection and along the Beavercreek Road and OR 213 corridors for through traffic only. The weekday a.m. and p.m. peak hour turning-movement volumes shown in Figure 4 were grown by the one-percent annual rate described above and used to conduct an operational analysis at each study intersection for forecast year 2016. The traffic volumes and results of this analysis are shown in Figure 5.



CM = CRITICAL MOVEMENT (TWSC)
LOS = INTERSECTION LEVEL OF SERVICE (AWSC) / CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
Del = INTERSECTION AVERAGE CONTROL DELAY (AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
TWC = TWO-WAY STOP CONTROL
AWSC= ALL-WAY STOP CONTROL



YEAR 2014 BACKGROUND TRAFFIC OPERATIONS WEEKDAY AM & PM PEAK HOURS OREGON CITY, OREGON

Figure 5

2016 Background Traffic Operations

As shown in Figure 5, all intersections except for the Beavercreek Road/Loder Road intersection (during the weekday a.m. peak hour) are forecast to continue to operate acceptably during the weekday a.m. and p.m. peak hours. The Beavercreek Road/Loder Road intersection continues to operate at LOS F (but under capacity) on the westbound approach. *Attachment "E" includes the level-of-service worksheets under year 2016 background traffic conditions.*

Proposed Development Plan

The proposed development (assumes a 2016 buildout) includes construction of 183 residential rental units and approximately 378 parking spaces. A detailed breakdown of the unit types is provided below.

- Apartment building (three-story elevator-served or walk-up building type): 141 units
- Rental Townhome (live/work): 36 units
- Studio/group housing: 6 units

Figure 2 illustrates the access from Beavercreek Road.

Trip Generation

The trip generation for the proposed site is based on empirical data from the standard reference manual *Trip Generation, 9th Edition,* published by the Institute of Transportation Engineers (ITE) (Reference 7). Table 4 summarizes the estimated site trip generation of the proposed development plan during a typical weekday, as well as typical weekday a.m. and p.m. peak hours.

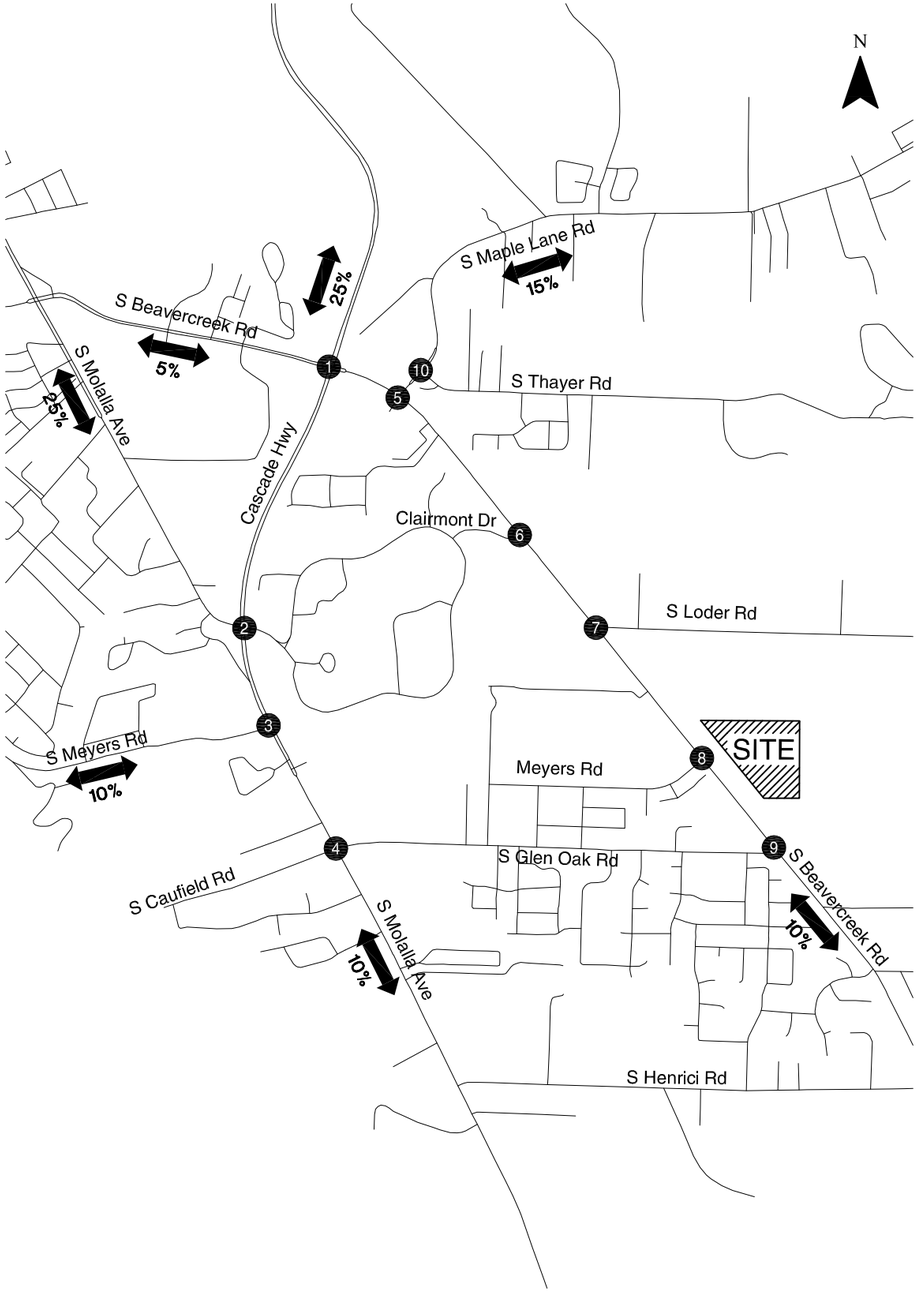
Table 4 Estimated Trip Generation

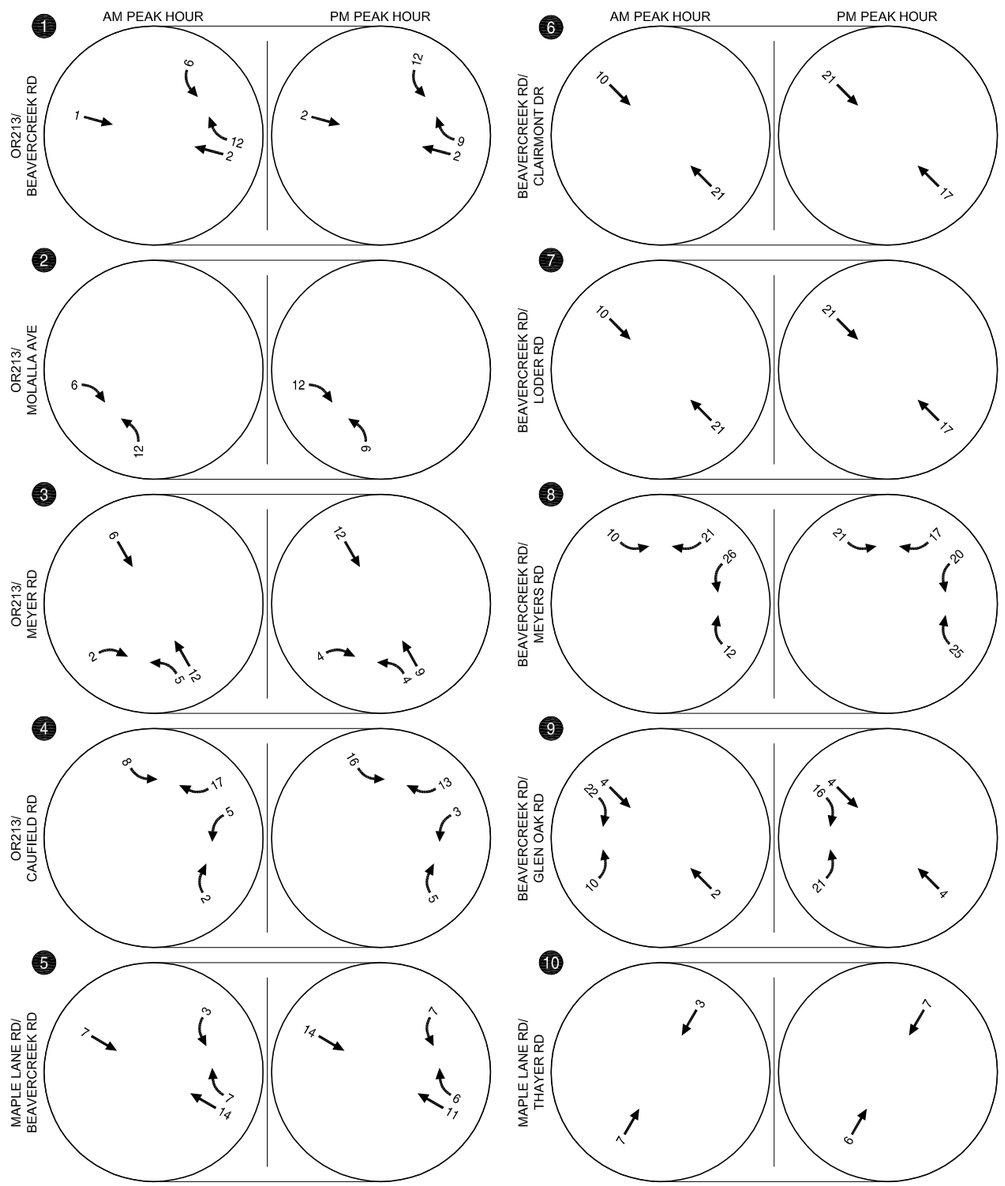
Land Use	Size (units)	Daily Trips[1]	Weekday AM Peak Hour			Weekday PM Peak Hour		
			Total	In	Out	Total	In	Out
Mid-Rise Apartment (ITE Code 223)	147	570[1]	44	14	30	57	33	24
Rental Townhouse (ITE Code 224)	36	260[1]	25	8	17	26	13	13
Total	**183**	**810[1]**	**69**	**22**	**47**	**83**	**46**	**37**

[1] Estimated as 10-times the weekday p.m. peak hour trip generation

Site Trip Distribution/Trip Assignment

The distribution of site-generated trips was determined based on a review of the existing transportation network, current turning movement patterns, and the nature of the proposed development. The estimated trip distribution pattern is shown in Figure 6. The estimated site-generated trips were assigned to the network by distributing the trips shown in Table 4 according to the trip distribution pattern shown in Figure 6. Figure 6 also illustrates the net new site-generated trips that are expected to use the roadway system during the weekday a.m. and p.m. peak hours.





ESTIMATED TRIP DISTRIBUTION PATTERN & SITE-GENERATED TRIPS
WEEKDAY AM & PM PEAK HOURS
OREGON CITY, OREGON

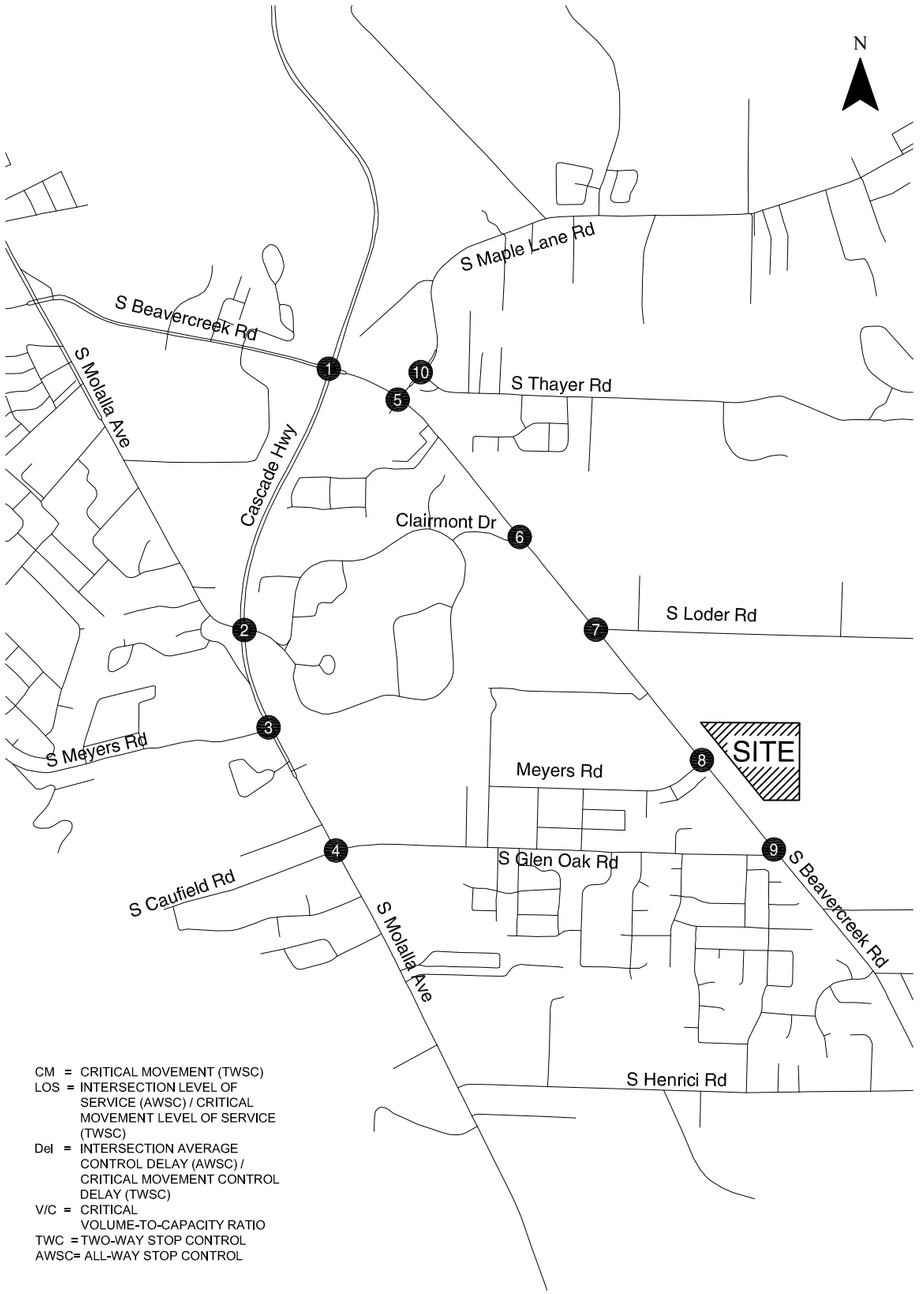
Figure 6

Year 2016 Total Traffic Conditions

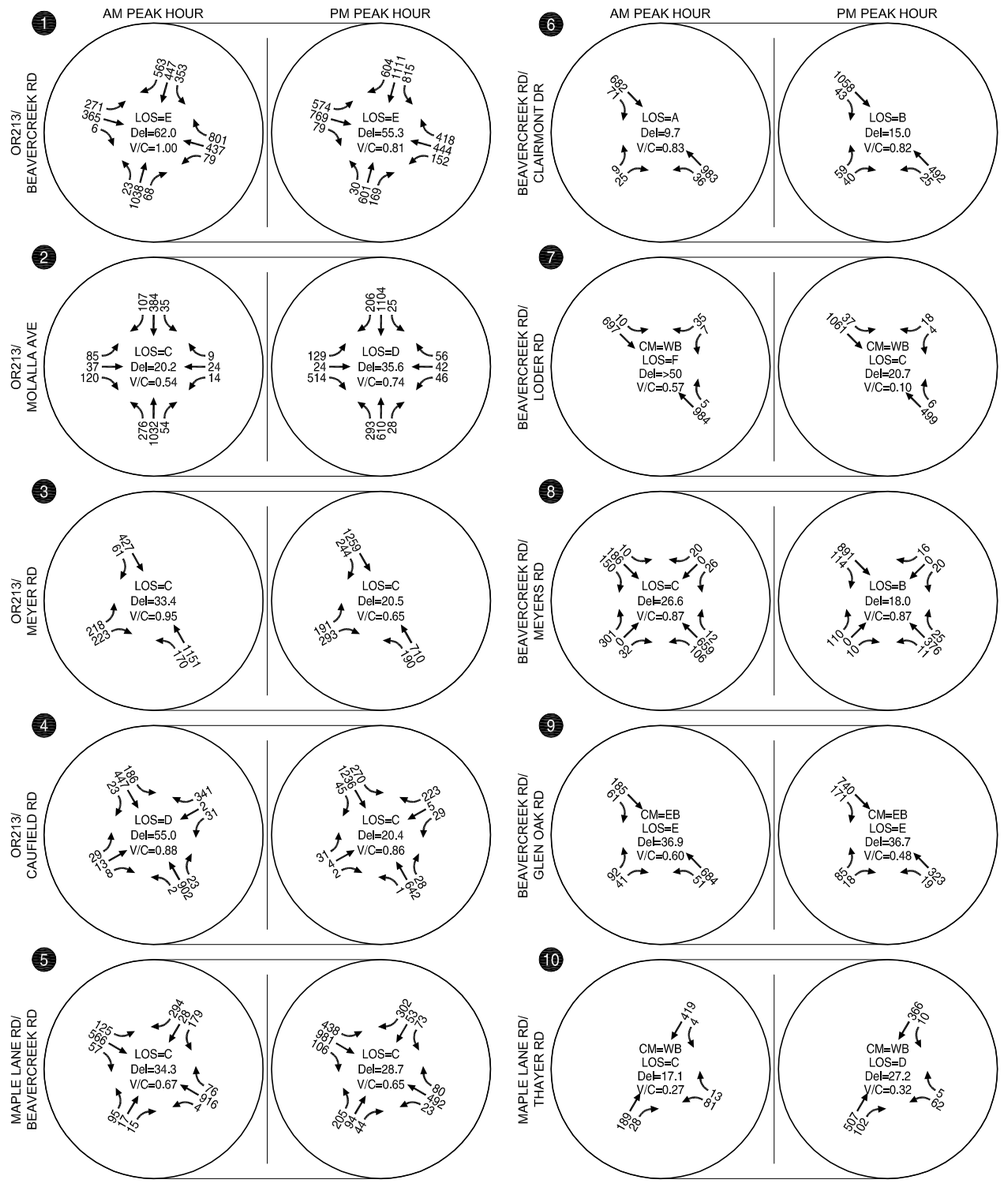
The total traffic conditions analysis forecasts how the study area's transportation system will operate with the traffic generated by the proposed development. As discussed previously, the appropriate growth rate for regional traffic growth was applied. The estimated site-generated traffic (shown in Figure 6) was added to the background traffic volumes (shown in Figure 5) during the weekday a.m. and p.m. peak hours to arrive at the total traffic volumes that are shown in Figure 7.The weekday a.m. and p.m. peak hour turning-movement volumes shown in Figure 7 were used to conduct an operational analysis at each study intersection.

For the proposed site access (east leg of the Meyers Road/Beavercreek Road intersection), the analysis assumes a separate left-turn lane and shared through-right in the westbound direction. A southbound left turn lane into the site is also assumed. This geometry is consistent with the ultimate vision of the Beavercreek Concept Plan, which includes a three-lane green street design for the Meyers Road intersection. The Plan was prepared in 2008 to guide the creation of a complete and sustainable community for the 453 acres annexed into the urban growth boundary between 2002 and 2004 in southeast Oregon City (Reference

The results of this total traffic analysis shown in Figure 7 indicate that all study intersections are forecast to continue to operate acceptably during the weekday a.m. and p.m. peak hours except the Beavercreek Road/Loder Road intersection (during the weekday a.m. peak hour). As shown in Figure 6, no site-generated traffic is anticipated to impact the critical movement (westbound left turn) at the Beavercreek Road/Loder Road intersection. As such, no mitigations associated with the proposed development traffic impact are recommended at this time. *Attachment "F" includes the level-of-service worksheets under year 2016 total traffic conditions.*



CM = CRITICAL MOVEMENT (TWSC)
LOS = INTERSECTION LEVEL OF SERVICE (AWSC) / CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
Del = INTERSECTION AVERAGE CONTROL DELAY (AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
TWC = TWO-WAY STOP CONTROL
AWSC= ALL-WAY STOP CONTROL



YEAR 2014 TOTAL TRAFFIC OPERATIONS
WEEKDAY AM & PM PEAK HOURS
OREGON CITY, OREGON

Figure 7

OTHER CONSIDERATIONS

The remainder of this report outlines additional considerations related to long-term horizon turn lane needs and sight distance considerations. This material was prepared in compliance with a condition of approval of the 2010 property rezone.

Meyer Road Extension 2027 Horizon Year Analysis

A 2027 horizon year analysis was prepared for the OR 213/Meyers Road intersection to address the planned future Meyers Road extension between OR 213 and Beavercreek Road.

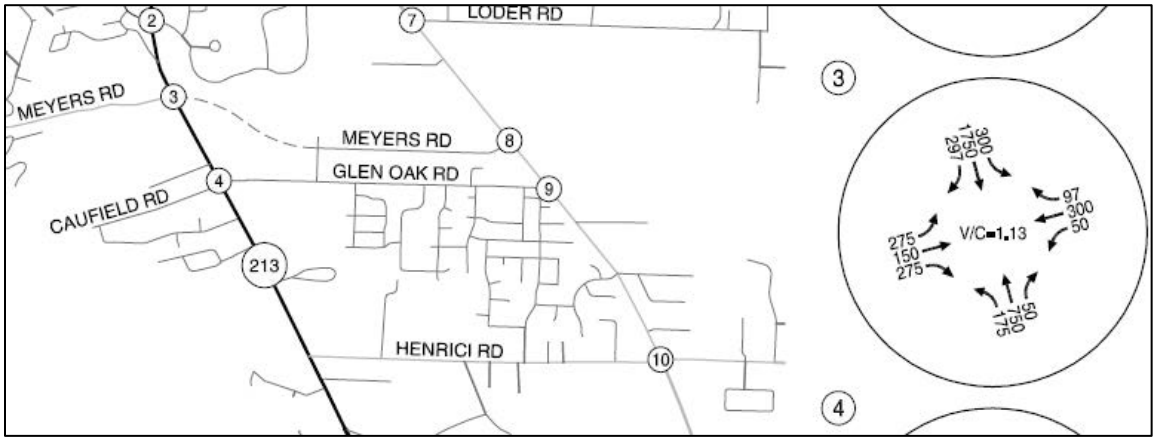
2027 Background Traffic Operations

With the recently-adopted Oregon City TSP (Reference 5), this improvement is considered "reasonably likely" and was previously addressed in the *Beavercreek Road/Meyers Road Rezone Study* (Reference 1). As shown in Figure 10 of the 2010 study, the impact of a rezoned reasonable worst-case development scenario created a "significant impact" at the future four-legged OR 213/Meyers Road intersection. From the 2010 study:

> *Based on direction from ODOT Region 1 staff, the proposed rezone would be determined to significantly impact a study intersection already in failure (defined as having a volume-to-capacity ratio greater than 0.99) if the volume-to-capacity ratio at the intersection increased by more than 0.01. (Reference 1)*

The adopted 2010 study forecasted the OR 213/Meyers Road intersection to operate at a volume-to-capacity ratio of 1.13 without the impact of site-added traffic from a rezone (2027 background traffic conditions are shown in Figure 8 of the study). The following exhibit is an excerpt from the 2010 *Beavercreek Road/Meyers Road Rezone Study (Figure 8)* in which the forecast 2027 volumes at the OR 213/Meyers Road intersection are shown with the Meyers Road extension assumed.

Exhibit 1 Excerpt from Figure 8 of the *2010 Beavercreek Road/Meyers Road Rezone Study (Weekday PM Peak Hour)*



As shown in Exhibit 1, the Beavercreek Road/Meyers Road intersection is forecast to operate at a volume-to-capacity ratio greater than 0.99 during the weekday p.m. peak hour. As such, an increase over the forecast volume-to-capacity ratio of greater than 0.01 would represent a "significant impact" to the intersection and would require mitigation. *Attachment "G" includes the level-of-service worksheets under year 2027 background traffic conditions.*

Proposed Development Site-Added Traffic (183 residential units)

The proposed development (183 residential housing units) site-generated traffic shown in Figure 6 (Intersection #3) was re-routed for the Meyers Road extension consistent with the 2010 Rezone Study methodology. The re-routed volumes were then added to the 2027 background traffic volumes shown in Exhibit 1 to arrive at the forecast 2027 total traffic volumes with the proposed development. These volumes and are summarized in Table 5.

Table 5 Year 2027 Total Volumes at the Beavercreek Road/Meyers Road Intersection

Movement	2027 Background Traffic Volumes	Site Added Traffic (no Meyers Road extension assumed)	Re-routed Site Added Traffic (assumes Meyers Road extension)	2027 Total Traffic Volumes
Northbound Left	175	4	--	175
Northbound Through	750	9	--	750
Northbound Right	50	--	--	50
Southbound Left	300	--	12	312
Southbound Through	1,750	12	--	1,750
Southbound Right	297	--	--	297
Eastbound Left	275	--	--	275
Eastbound Through	150	--	4	154
Eastbound Right	275	4	--	275
Westbound Left	50	--	--	50
Westbound Through	300	--	4	304
Westbound Right	97	--	9	106

2027 Total Traffic Operations (183 residential units)

The 2027 total traffic volumes shown in Table 5 were used to prepare an operational analysis at the Beavercreek Road/Meyers Road intersection. The results of the analysis are provided in Table 6.

Table 6 Year 2027 Total Traffic Conditions, Weekday PM Peak Hour

Intersection	Performance Standard	2027 Base Condition	2027 Condition with Site-Added Traffic	Incremental Impact
OR 213/ Meyers Road	0.99	1.13	1.14	+0.01

As shown in Table 6, the proposed development site-added traffic is forecast to have a one percent impact on the operations of the OR 213/Meyers Road intersection upon buildout of the Meyers Road extension. As such, per the definition provided in the 2010 rezone study (Reference 1), there is no resulting "significant impact" anticipated at this location for the proposed 183-unit development. *Attachment "G" includes the level-of-service worksheets under year 2027 total traffic conditions.*

Sensitivity Analysis (up to 196 residential units)

A sensitivity analysis was prepared for the proposed development to understand the trigger for a "significant impact" at the OR 213/Meyers Road intersection upon buildout of the Meyers Road extension. This sensitivity analysis was prepared in order to address a potential change to the number of units that may result from comments or suggestions from the process of design review. With this analysis, the maximum number of developable units was identified that **would not** trigger a "significant impact" at the OR 213/Meyers Road intersection for year 2027.

The sensitivity analysis consisted of an iterative process in which the number of apartment units was increased incrementally, the site-generated trips were assigned to the OR 213/Meyers Road intersection, and an operations assessment conducted. The sensitivity analysis shows that up to 196 residential units could be constructed on-site without triggering a volume-to-capacity impact greater than 0.01 at the OR 213/Meyers Road intersection upon buildout of the Meyers Road extension for year 2027 traffic volumes. As such, should the number of apartment units fluctuate after the submittal of this report, no additional analysis is required as long as the number of apartments does not exceed 196 units. Additional detail of the unit breakdown, trip generation, and operations summary for the sensitivity analysis is included in *Attachment "H." Attachment "H" also includes the level-of-service worksheets under year 2027 sensitivity analysis total traffic conditions.*

Preliminary Sight Distance Verification

A preliminary sight distance verification was conducted from the proposed access location at the Beavercreek Road/Meyers Road intersection. Based on preliminary investigation, stopping sight distance and intersection sight distance in excess of approximately 450 feet is provided to the north of the access and in excess of approximately 650 feet is provided to the south. Upon development, it is recommended that any existing foliage within the public right-of-way be cleared and/or maintained to maximize the available sight distance upon site development. It is further recommended that any landscaping, above ground utilities or signage associated with the proposed development be located and maintained to ensure that adequate intersection sight distance is continued to be provided.

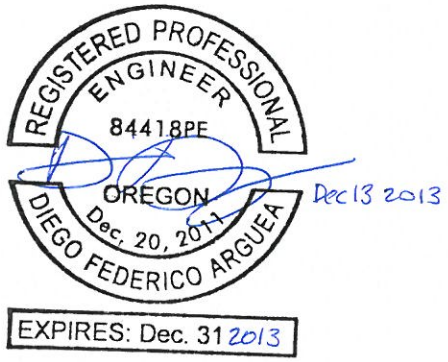
CONCLUSION

Based on the analysis and findings herein, the proposed development can be constructed while maintaining acceptable operations on the adjacent study roadways and intersections. We trust this letter adequately addresses the traffic impacts associated with the proposed Beavercreek Road mixed-use housing development. Please feel free to contact us if you have any questions.

Sincerely,
KITTELSON & ASSOCIATES, INC.

Diego Arguea, P.E.
Senior Engineer

Chris Brehmer, P.E.
Principal Engineer



REFERENCES

1. Kittelson & Associates. *Beavercreek Road/Meyers Road Rezone Transportation Planning Rule (TPR) Analysis.* 2010.
2. TriMet. http://trimet.org/. October 2013.
3. Oregon Department of Transportation. *Analysis Procedures Manual.* April 2010.
4. Transportation Research Board. *Highway Capacity Manual*. 2000.
5. City of Oregon City. *Transportation System Plan Update.* 2013.
6. Oregon Department of Transportation. *1999 Oregon Highway Plan.* March 1999.
7. Institute of Transportation Engineers. *Trip Generation: 9th Edition*. 2012.
8. City of Oregon City. *Beavercreek Road Concept Plan*. August 2008.

ATTACHMENTS

A. Traffic Count Data and Seasonal Adjustment Data

B. Description of Level-of-Service Methods and Criteria

C. Year 2013 Existing Conditions Level-of-Service Worksheets

D. Crash Data

E. Year 2016 Background Conditions Level-of-Service Worksheets

F. Year 2016 Total Conditions Level-of-Service Worksheets

G. Year 2027 Background and Total Traffic Level-of-Service Worksheets (177 residential units)

H. Year 2027 Total Traffic Level-of-Service Worksheets (196 residential units)

Attachment A
Traffic Count Data

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: OR 213 -- S Beavercreek Rd

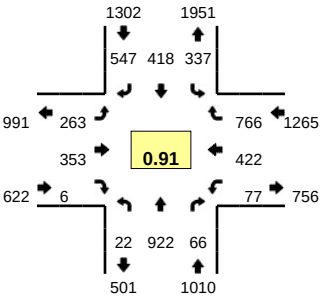
CITY/STATE: Oregon City, OR

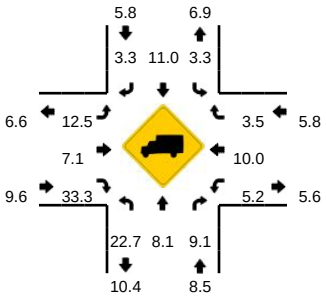
QC JOB #: 11203619

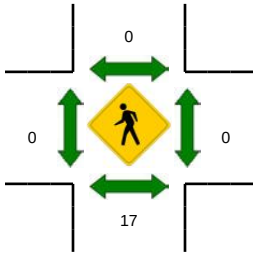
DATE: Thu, Sep 26 2013

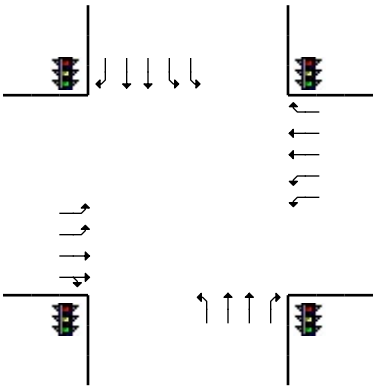
Peak-Hour: 7:00 AM -- 8:00 AM

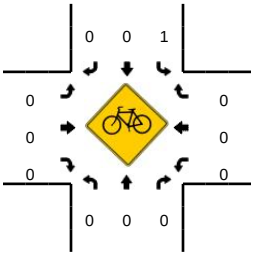
Peak 15-Min: 7:25 AM -- 7:40 AM

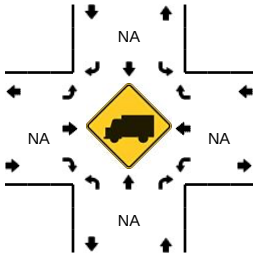


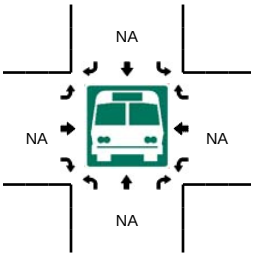












5-Min Count Period Beginning At	OR 213 (Northbound)				OR 213 (Southbound)				S Beavercreek Rd (Eastbound)				S Beavercreek Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	87	6	0	24	34	52	0	23	29	0	0	4	28	49	0	338	
7:05 AM	0	63	7	0	23	21	28	0	23	43	0	0	4	38	69	0	319	
7:10 AM	0	94	3	0	28	32	39	0	13	18	1	0	2	24	61	0	315	
7:15 AM	0	72	3	0	30	21	26	0	27	38	0	0	9	38	57	0	321	
7:20 AM	0	64	7	0	16	29	40	0	32	53	0	0	13	18	58	0	330	
7:25 AM	5	85	9	0	45	46	45	0	25	45	0	0	6	33	61	0	405	
7:30 AM	2	79	8	0	36	42	41	0	11	31	0	0	5	36	68	0	359	
7:35 AM	1	78	5	0	29	35	57	0	34	25	2	0	2	48	74	0	390	
7:40 AM	5	73	3	0	22	27	40	0	17	16	1	0	5	47	85	0	341	
7:45 AM	3	94	4	0	27	54	50	0	15	21	1	0	5	27	79	0	380	
7:50 AM	0	67	4	0	27	31	62	0	30	20	1	0	16	49	52	0	359	
7:55 AM	4	66	7	0	30	46	67	0	13	14	0	0	6	36	53	0	342	4199
8:00 AM	1	61	8	0	22	52	52	0	26	21	2	0	9	31	40	0	325	4186
8:05 AM	1	53	11	0	21	50	43	0	21	20	0	0	14	22	42	0	298	4165
8:10 AM	5	61	6	0	21	31	40	0	17	14	2	0	8	19	43	0	267	4117
8:15 AM	3	73	7	0	23	52	46	0	17	10	0	0	7	23	48	0	309	4105
8:20 AM	1	65	6	0	21	33	51	0	29	19	1	0	14	30	48	0	318	4093
8:25 AM	2	72	6	0	24	45	40	0	22	9	0	0	9	34	48	0	311	3999
8:30 AM	0	76	9	0	18	42	43	0	31	22	0	0	9	22	43	0	315	3955
8:35 AM	5	52	6	0	24	33	40	0	12	17	0	0	6	29	30	0	254	3819
8:40 AM	4	72	7	0	18	56	31	0	26	20	1	0	6	29	44	0	314	3792
8:45 AM	2	42	1	0	34	42	35	0	36	14	0	0	8	32	47	0	293	3705
8:50 AM	5	66	2	0	21	33	33	0	23	21	1	0	6	40	44	0	295	3641
8:55 AM	0	49	7	0	19	48	43	0	27	10	2	0	5	27	29	0	266	3565

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	32	968	88	0	440	492	572	0	280	404	8	0	52	468	812	0	4616
Heavy Trucks	8	68	8		16	56	28		56	0	4		0	28	32		304
Pedestrians		8				0				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

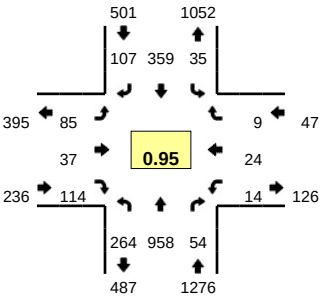
LOCATION: OR 213 -- S Molalla Ave/S Douglas Loop

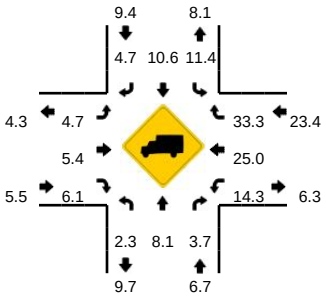
QC JOB #: 11203617

CITY/STATE: Oregon City, OR

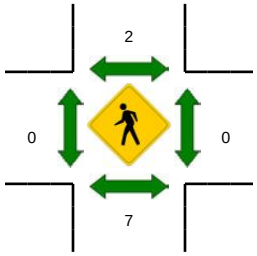
DATE: Thu, Sep 26 2013

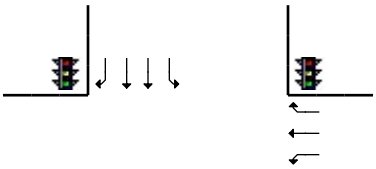
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:25 AM -- 7:40 AM

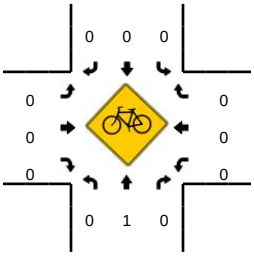


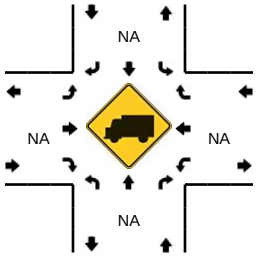


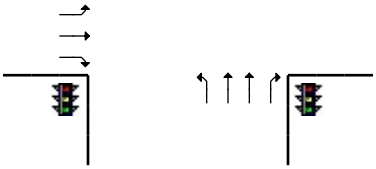
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

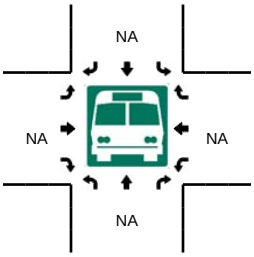












5-Min Count Period Beginning At	OR 213 (Northbound)				OR 213 (Southbound)				S Molalla Ave/S Douglas Loop (Eastbound)				S Molalla Ave/S Douglas Loop (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	24	97	2	0	4	27	5	0	5	4	8	0	1	2	0	0	179	
7:05 AM	13	82	4	0	1	27	8	0	16	3	5	0	1	3	1	0	164	
7:10 AM	19	70	3	0	4	18	11	0	3	1	9	0	1	0	1	0	140	
7:15 AM	18	76	3	0	0	20	8	0	7	4	13	0	0	3	1	0	153	
7:20 AM	21	93	7	0	2	30	12	0	3	1	7	0	2	1	3	0	182	
7:25 AM	12	73	4	0	4	37	15	0	12	6	11	0	1	2	0	0	177	
7:30 AM	23	99	8	0	4	27	4	0	4	0	9	0	1	2	1	0	182	
7:35 AM	22	80	2	0	2	48	8	0	8	5	6	0	1	2	1	0	185	
7:40 AM	31	83	2	0	2	19	2	0	3	4	7	0	2	3	0	0	158	
7:45 AM	27	69	5	0	5	37	9	0	11	3	15	0	1	3	0	0	185	
7:50 AM	40	72	4	0	2	42	13	0	5	0	10	0	2	0	0	0	190	
7:55 AM	14	64	10	0	5	27	12	0	8	6	14	0	1	3	1	0	165	2060
8:00 AM	24	64	10	0	5	29	13	0	10	7	10	0	0	1	2	0	175	2056
8:05 AM	12	56	0	0	2	50	15	0	11	2	13	0	2	4	0	0	167	2059
8:10 AM	30	68	2	0	6	36	14	0	5	2	15	0	0	0	0	0	178	2097
8:15 AM	6	63	3	0	4	38	15	0	9	6	22	0	1	0	3	0	170	2114
8:20 AM	30	77	2	1	1	29	13	0	3	2	10	0	1	3	0	0	172	2104
8:25 AM	25	52	3	0	1	31	14	0	9	3	11	0	4	6	0	0	159	2086
8:30 AM	23	90	0	0	8	26	9	0	8	2	16	0	1	0	0	0	183	2087
8:35 AM	26	45	0	0	0	38	7	0	9	2	12	0	0	0	1	0	140	2042
8:40 AM	25	72	1	0	4	45	6	0	8	1	14	0	0	0	1	0	177	2061
8:45 AM	12	50	2	0	9	38	11	0	10	1	9	0	0	2	1	0	145	2021
8:50 AM	32	59	2	0	1	38	5	0	0	2	5	0	1	0	2	0	147	1978
8:55 AM	24	51	4	0	11	37	8	0	5	0	4	0	0	3	0	0	147	1960

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	228	1008	56	0	40	448	108	0	96	44	104	0	12	24	8	0	2176
Heavy Trucks	4	76	4		8	52	0		0	0	12		0	4	8		168
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

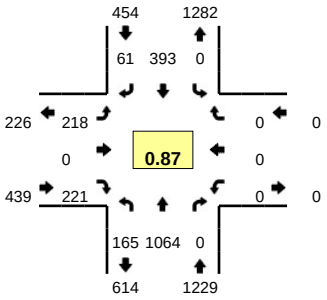
Type of peak hour being reported: User-Defined

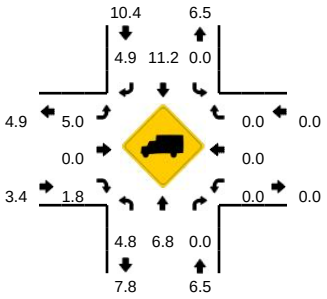
Method for determining peak hour: Total Entering Volume

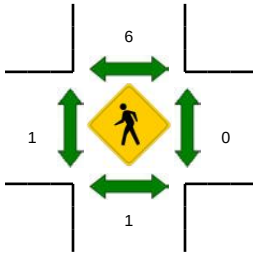
LOCATION: OR 213 -- S Meyers Rd
CITY/STATE: Oregon City, OR

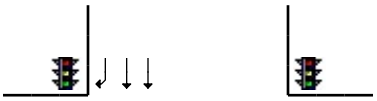
QC JOB #: 11203615
DATE: Thu, Sep 26 2013

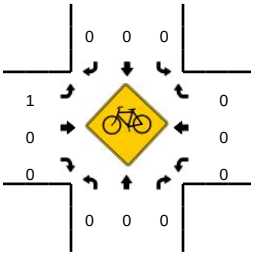
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:15 AM -- 7:30 AM

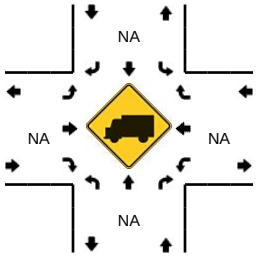


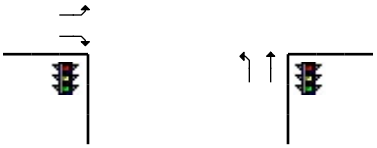


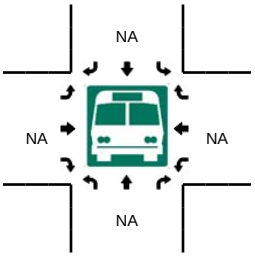












5-Min Count Period Beginning At	OR 213 (Northbound)				OR 213 (Southbound)				S Meyers Rd (Eastbound)				S Meyers Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	12	87	0	0	0	26	5	0	21	0	16	0	0	0	0	0	167	
7:05 AM	6	83	0	0	0	28	6	0	14	0	13	0	0	0	0	0	150	
7:10 AM	12	80	0	0	0	19	4	0	13	0	19	0	0	0	0	0	147	
7:15 AM	12	96	0	0	0	37	4	0	16	0	34	0	0	0	0	0	199	
7:20 AM	14	94	0	0	0	24	4	0	20	0	34	0	0	0	0	0	190	
7:25 AM	19	98	0	0	0	52	3	0	18	0	32	0	0	0	0	0	222	
7:30 AM	18	83	0	0	0	25	1	0	28	0	21	0	0	0	0	0	176	
7:35 AM	22	99	0	0	0	46	9	0	15	0	12	0	0	0	0	0	203	
7:40 AM	24	85	0	0	0	18	5	0	23	0	10	0	0	0	0	0	165	
7:45 AM	11	101	0	0	0	42	6	0	16	0	6	0	0	0	0	0	182	
7:50 AM	11	82	0	0	0	40	9	0	19	0	12	0	0	0	0	0	173	
7:55 AM	4	76	0	0	0	36	5	0	15	0	12	0	0	0	0	0	148	2122
8:00 AM	12	65	0	0	0	37	4	0	19	0	7	0	0	0	0	0	144	2099
8:05 AM	9	80	0	0	0	47	18	0	14	0	5	0	0	0	0	0	173	2122
8:10 AM	17	67	0	0	0	42	2	0	19	0	8	0	0	0	0	0	155	2130
8:15 AM	11	79	0	0	0	53	9	0	14	0	11	0	0	0	0	0	177	2108
8:20 AM	8	73	0	0	0	44	6	0	26	0	8	0	0	0	0	0	165	2083
8:25 AM	7	65	0	0	0	57	5	0	20	0	6	0	0	0	0	0	160	2021
8:30 AM	13	93	0	0	0	27	6	0	23	0	10	0	0	0	0	0	172	2017
8:35 AM	10	74	0	0	0	54	4	0	16	0	7	0	0	0	0	0	165	1979
8:40 AM	4	55	0	0	0	34	10	0	21	0	14	0	0	0	0	0	138	1952
8:45 AM	6	63	0	0	0	43	4	0	8	0	7	0	0	0	0	0	131	1901
8:50 AM	11	70	0	0	0	31	10	0	21	0	8	0	0	0	0	0	151	1879
8:55 AM	9	73	0	0	0	32	7	0	16	0	5	0	0	0	0	0	142	1873

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	180	1152	0	0	0	452	44	0	216	0	400	0	0	0	0	0	2444
Heavy Trucks	8	52	0		0	52	4		8	0	8		0	0	0		132
Pedestrians		4				0				4				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

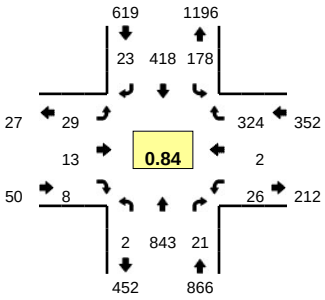
LOCATION: OR 213 -- S Caufield Rd/S Glen Oak Rd

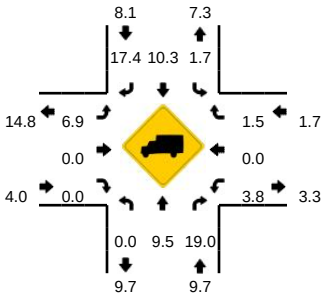
QC JOB #: 11203613

CITY/STATE: Oregon City, OR

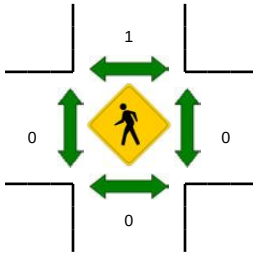
DATE: Thu, Sep 26 2013

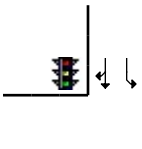
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:25 AM -- 7:40 AM

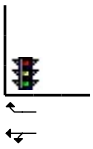


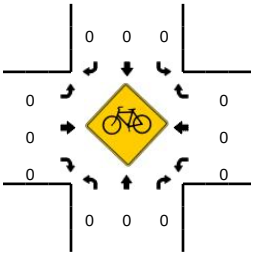


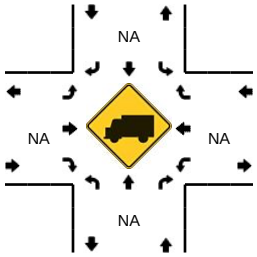
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

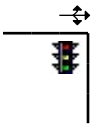


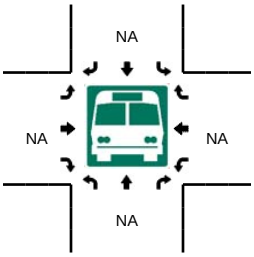












5-Min Count Period Beginning At	OR 213 (Northbound)				OR 213 (Southbound)				S Caufield Rd/S Glen Oak Rd (Eastbound)				S Caufield Rd/S Glen Oak Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	78	0	0	12	31	1	0	2	1	0	0	2	0	14	0	141	
7:05 AM	0	45	2	0	10	31	2	0	2	0	1	0	3	0	26	0	122	
7:10 AM	0	81	4	0	15	15	3	0	1	0	0	0	0	0	24	0	143	
7:15 AM	0	72	3	0	31	36	0	0	4	1	0	0	2	0	23	0	172	
7:20 AM	1	72	4	0	20	22	3	0	2	1	0	0	4	0	34	0	163	
7:25 AM	1	69	0	0	32	48	5	0	1	4	0	0	1	0	37	0	198	
7:30 AM	0	67	2	0	23	32	3	0	3	5	0	0	3	0	38	0	176	
7:35 AM	0	73	1	0	17	52	0	0	2	1	0	0	0	2	39	0	187	
7:40 AM	0	77	2	0	3	23	2	0	5	0	1	0	6	0	34	0	153	
7:45 AM	0	63	1	0	4	45	0	0	6	0	4	0	1	0	31	0	155	
7:50 AM	0	81	1	0	5	45	2	0	0	0	2	0	1	0	10	0	147	
7:55 AM	0	65	1	0	6	38	2	0	1	0	0	0	3	0	14	0	130	1887
8:00 AM	0	52	1	0	7	34	0	0	4	0	1	0	1	0	11	0	111	1857
8:05 AM	1	68	2	0	9	40	4	0	1	0	0	0	0	0	17	0	142	1877
8:10 AM	1	65	1	0	5	38	3	0	3	0	0	0	0	0	18	0	134	1868
8:15 AM	1	66	0	0	8	56	2	0	2	0	0	0	1	0	13	0	149	1845
8:20 AM	0	69	1	0	2	33	1	0	3	0	0	0	3	0	15	0	127	1809
8:25 AM	0	55	0	0	6	44	4	0	4	1	0	0	1	0	16	0	131	1742
8:30 AM	0	79	0	0	3	36	1	0	3	0	1	0	0	0	13	0	136	1702
8:35 AM	0	56	0	0	9	37	2	0	4	1	0	0	1	0	11	0	121	1636
8:40 AM	0	54	2	0	4	48	1	0	2	0	1	0	0	1	5	0	118	1601
8:45 AM	1	62	0	0	15	40	1	0	1	0	0	0	0	1	13	0	134	1580
8:50 AM	0	67	1	0	6	32	1	0	1	0	0	0	0	0	10	0	118	1551
8:55 AM	0	69	1	0	1	35	3	0	2	0	1	0	0	0	9	0	121	1542

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	836	12	0	288	528	32	0	24	40	0	0	16	8	456	0	2244
Heavy Trucks	0	88	0		0	68	0		0	0	0		0	0	4		160
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

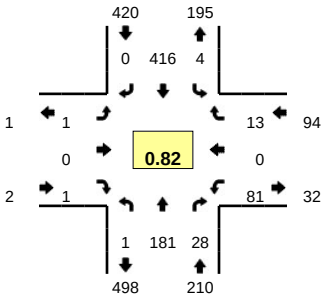
Method for determining peak hour: Total Entering Volume

LOCATION: S Maple Lane Rd -- S Thayer Rd

QC JOB #: 11203611

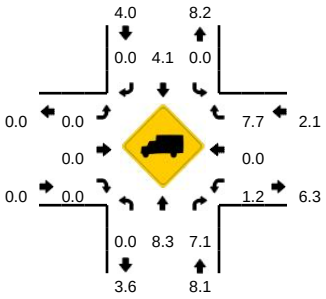
CITY/STATE: Oregon City, OR

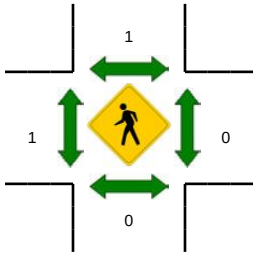
DATE: Thu, Sep 26 2013

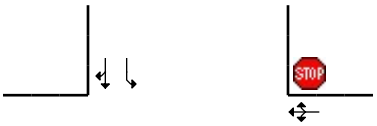


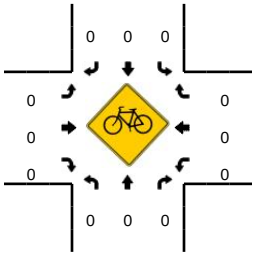
Peak-Hour: 7:00 AM -- 8:00 AM

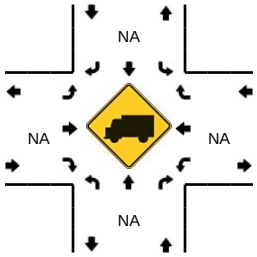
Peak 15-Min: 7:20 AM -- 7:35 AM

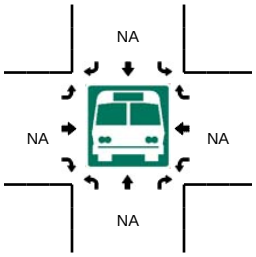












5-Min Count Period Beginning At	S Maple Lane Rd (Northbound)				S Maple Lane Rd (Southbound)				S Thayer Rd (Eastbound)				S Thayer Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	10	2	0	0	40	0	0	0	0	0	0	6	0	0	0	58	
7:05 AM	0	17	2	0	0	17	0	0	0	0	0	0	12	0	0	0	48	
7:10 AM	0	15	1	0	0	33	0	0	0	0	0	0	8	0	1	0	58	
7:15 AM	0	12	1	0	0	38	0	0	0	0	0	0	4	0	2	0	57	
7:20 AM	0	12	0	0	0	54	0	0	0	0	0	0	8	0	0	0	74	
7:25 AM	0	17	4	0	0	43	0	0	0	0	0	0	5	0	1	0	70	
7:30 AM	0	23	1	0	0	45	0	0	0	0	0	0	7	0	2	0	78	
7:35 AM	0	19	2	0	0	33	0	0	0	0	0	0	10	0	3	0	67	
7:40 AM	1	6	4	0	0	30	0	0	0	0	1	0	5	0	1	0	48	
7:45 AM	0	27	2	0	0	21	0	0	0	0	0	0	4	0	3	0	57	
7:50 AM	0	16	6	0	2	34	0	0	1	0	0	0	5	0	0	0	64	
7:55 AM	0	7	3	0	2	28	0	0	0	0	0	0	7	0	0	0	47	726
8:00 AM	0	16	1	0	1	30	0	0	0	0	0	0	4	0	0	0	52	720
8:05 AM	0	19	2	0	3	22	0	0	0	0	0	0	4	0	0	0	50	722
8:10 AM	0	22	2	0	0	26	0	0	0	0	0	0	4	0	0	0	54	718
8:15 AM	0	21	2	0	0	20	0	0	0	0	0	0	8	0	1	0	52	713
8:20 AM	0	21	2	0	0	32	0	0	0	0	0	0	5	0	0	0	60	699
8:25 AM	0	19	1	0	0	30	0	0	0	0	0	0	2	0	0	0	52	681
8:30 AM	0	19	2	0	0	24	0	0	0	0	0	0	12	0	0	0	57	660
8:35 AM	0	29	0	1	0	22	0	0	0	0	0	0	6	0	1	0	59	652
8:40 AM	0	16	2	0	0	31	0	0	0	0	0	0	4	0	0	0	53	657
8:45 AM	0	23	2	0	1	34	0	0	0	0	0	0	10	1	0	0	71	671
8:50 AM	0	15	3	0	0	37	0	0	0	0	0	0	4	0	0	0	59	666
8:55 AM	0	8	0	0	0	28	0	0	0	0	0	0	3	0	0	0	39	658

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	208	20	0	0	568	0	0	0	0	0	0	80	0	12	0	888
Heavy Trucks	0	8	4		0	4	0		0	0	0		4	0	0		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

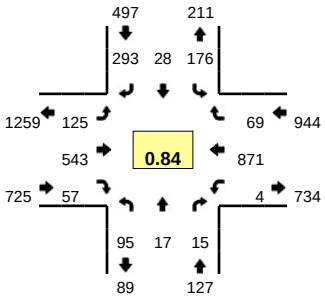
Method for determining peak hour: Total Entering Volume

LOCATION: S Maple Lane Rd -- S Beavercreek Rd

QC JOB #: 11203609

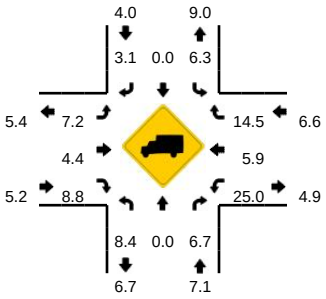
CITY/STATE: Oregon City, OR

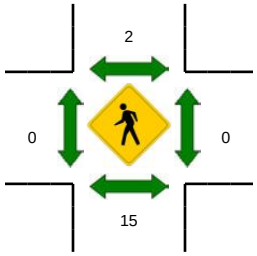
DATE: Thu, Sep 26 2013

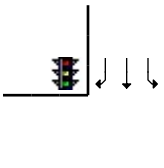


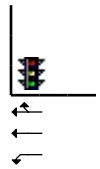
Peak-Hour: 7:00 AM -- 8:00 AM

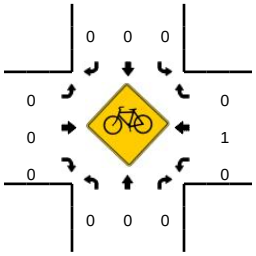
Peak 15-Min: 7:20 AM -- 7:35 AM

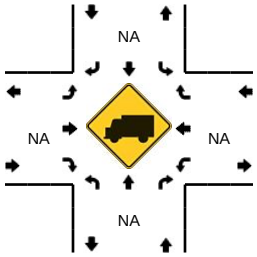


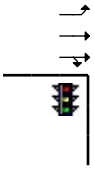


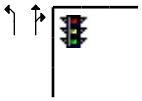


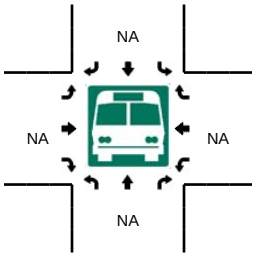












5-Min Count Period Beginning At	S Maple Lane Rd (Northbound)				S Maple Lane Rd (Southbound)				S Beavercreek Rd (Eastbound)				S Beavercreek Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	4	1	1	0	16	1	28	0	9	32	3	0	1	51	2	0	149	
7:05 AM	4	1	1	0	7	1	19	0	11	47	5	0	0	79	6	0	181	
7:10 AM	9	1	1	0	15	3	23	0	12	51	4	0	0	72	4	0	195	
7:15 AM	10	1	1	0	15	2	18	0	7	56	6	0	0	67	4	0	187	
7:20 AM	3	1	1	0	37	3	34	0	10	46	2	0	0	63	7	0	207	
7:25 AM	6	2	4	0	23	1	19	0	10	77	4	0	1	94	6	0	247	
7:30 AM	10	3	2	0	21	6	26	0	13	62	4	0	1	74	8	0	230	
7:35 AM	11	2	0	0	15	3	27	0	5	36	6	0	0	80	11	0	196	
7:40 AM	11	2	0	0	5	2	19	0	6	35	7	0	0	89	9	0	185	
7:45 AM	9	1	0	0	9	1	22	0	20	41	8	0	1	96	6	0	214	
7:50 AM	11	2	1	0	8	4	30	0	13	28	2	0	0	47	4	0	150	
7:55 AM	7	0	3	0	5	1	28	0	9	32	6	0	0	59	2	0	152	2293
8:00 AM	2	1	2	0	8	0	22	0	10	27	4	0	0	49	5	0	130	2274
8:05 AM	11	1	2	0	3	4	20	0	17	20	3	0	0	50	5	0	136	2229
8:10 AM	7	5	1	0	5	1	26	0	12	25	2	0	0	43	5	0	132	2166
8:15 AM	6	1	0	0	4	0	26	0	13	32	5	0	0	59	8	0	154	2133
8:20 AM	4	4	0	0	4	3	25	0	17	19	1	0	1	49	3	0	130	2056
8:25 AM	13	2	0	0	2	0	33	0	10	27	3	0	0	44	7	0	141	1950
8:30 AM	5	1	0	0	1	2	29	0	11	20	3	0	0	44	10	0	126	1846
8:35 AM	4	2	1	0	12	4	15	0	26	28	6	0	0	38	9	0	145	1795
8:40 AM	12	1	2	0	9	1	24	0	11	18	6	0	1	48	2	0	135	1745
8:45 AM	10	4	4	0	8	1	38	0	16	27	4	0	1	41	3	0	157	1688
8:50 AM	6	1	0	0	6	2	33	0	14	30	4	0	0	46	5	0	147	1685
8:55 AM	12	0	0	0	4	4	24	0	8	13	9	0	1	43	0	0	118	1651

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	76	24	28	0	324	40	316	0	132	740	40	0	8	924	84	0	2736
Heavy Trucks	12	0	4		4	0	8		8	16	8		0	60	12		132
Pedestrians		36				0				0				0			36
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: S Beavercreek Rd -- Clairmont Dr

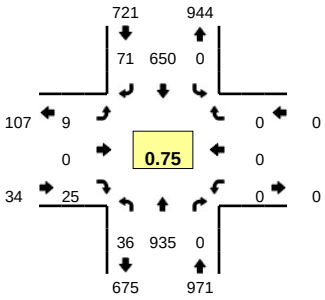
QC JOB #: 11203607

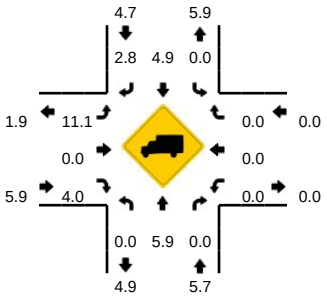
CITY/STATE: Oregon City, OR

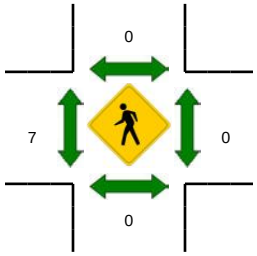
DATE: Thu, Sep 26 2013

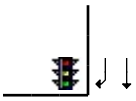
Peak-Hour: 7:00 AM -- 8:00 AM

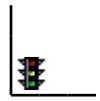
Peak 15-Min: 7:20 AM -- 7:35 AM

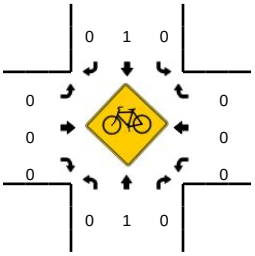


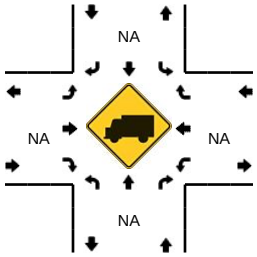


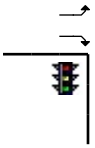


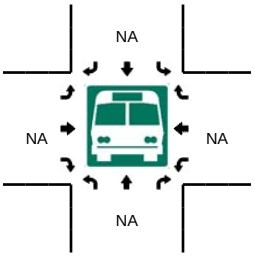












5-Min Count Period Beginning At	S Beavercreek Rd (Northbound)				S Beavercreek Rd (Southbound)				Clairmont Dr (Eastbound)				Clairmont Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	80	0	0	0	42	2	0	1	0	1	0	0	0	0	0	128	
7:05 AM	1	67	0	0	0	53	5	0	0	0	0	0	0	0	0	0	126	
7:10 AM	1	77	0	0	0	61	1	0	1	0	4	0	0	0	0	0	145	
7:15 AM	3	64	0	0	0	72	5	0	0	0	1	0	0	0	0	0	145	
7:20 AM	5	99	0	0	0	83	5	0	0	0	4	0	0	0	0	0	196	
7:25 AM	3	86	0	0	0	95	8	0	1	0	5	0	0	0	0	0	198	
7:30 AM	0	89	0	0	0	82	6	0	1	0	4	0	0	0	0	0	182	
7:35 AM	5	87	0	0	0	47	3	0	2	0	4	0	0	0	0	0	148	
7:40 AM	4	92	0	0	0	37	2	0	1	0	2	0	0	0	0	0	138	
7:45 AM	5	85	0	0	0	26	11	0	1	0	0	0	0	0	0	0	128	
7:50 AM	3	48	0	0	0	27	13	0	0	0	0	0	0	0	0	0	91	
7:55 AM	4	61	0	0	0	25	10	0	1	0	0	0	0	0	0	0	101	1726
8:00 AM	4	34	0	0	0	23	5	0	2	0	1	0	0	0	0	0	69	1667
8:05 AM	5	52	0	0	0	22	3	0	1	0	0	0	0	0	0	0	83	1624
8:10 AM	2	57	0	0	0	18	4	0	0	0	1	0	0	0	0	0	82	1561
8:15 AM	1	59	0	0	0	21	7	0	1	0	1	0	0	0	0	0	90	1506
8:20 AM	1	49	0	0	0	17	7	0	1	0	0	0	0	0	0	0	75	1385
8:25 AM	0	45	0	0	0	22	3	0	0	0	0	0	0	0	0	0	70	1257
8:30 AM	2	35	0	0	0	17	7	0	4	0	1	0	0	0	0	0	66	1141
8:35 AM	0	53	0	0	0	31	3	0	1	0	1	0	0	0	0	0	89	1082
8:40 AM	1	45	0	0	0	23	4	0	3	0	0	0	0	0	0	0	76	1020
8:45 AM	3	42	0	0	0	29	7	0	1	0	0	0	0	0	0	0	82	974
8:50 AM	1	42	0	0	0	23	6	0	2	0	1	0	0	0	0	0	75	958
8:55 AM	0	42	0	0	0	17	5	0	0	0	1	0	0	0	0	0	65	922

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	32	1096	0	0	0	1040	76	0	8	0	52	0	0	0	0	0	2304
Heavy Trucks	0	44	0		0	24	0		0	0	0		0	0	0		68
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

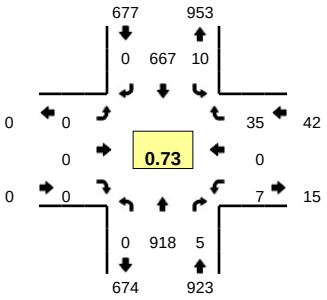
Method for determining peak hour: Total Entering Volume

LOCATION: S Beavercreek Rd -- S Loder Rd

QC JOB #: 11203605

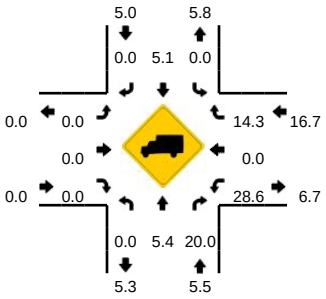
CITY/STATE: Oregon City, OR

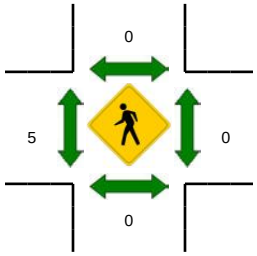
DATE: Thu, Sep 26 2013

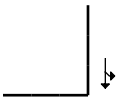


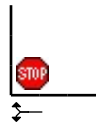
Peak-Hour: 7:00 AM -- 8:00 AM

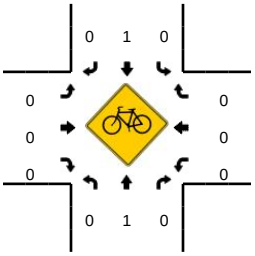
Peak 15-Min: 7:20 AM -- 7:35 AM

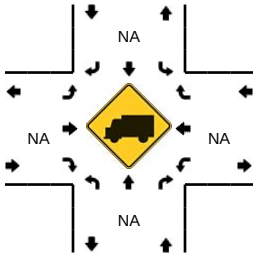


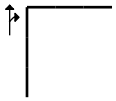


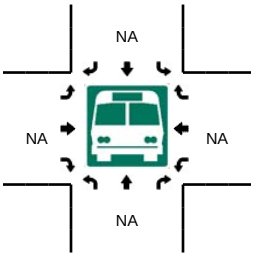












5-Min Count Period Beginning At	S Beavercreek Rd (Northbound)				S Beavercreek Rd (Southbound)				S Loder Rd (Eastbound)				S Loder Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	67	0	0	1	44	0	0	0	0	0	0	1	0	4	0	117	
7:05 AM	0	71	0	0	3	45	0	0	0	0	0	0	1	0	3	0	123	
7:10 AM	0	69	1	0	1	64	0	0	0	0	0	0	0	0	3	0	138	
7:15 AM	0	72	0	0	0	74	0	0	0	0	0	0	0	0	2	0	148	
7:20 AM	0	99	2	0	0	90	0	0	0	0	0	0	1	0	5	0	197	
7:25 AM	0	85	0	0	2	90	0	0	0	0	0	0	1	0	4	0	182	
7:30 AM	0	86	0	0	2	93	0	0	0	0	0	0	0	0	2	0	183	
7:35 AM	0	93	0	0	0	49	0	0	0	0	0	0	2	0	3	0	147	
7:40 AM	0	90	2	0	0	40	0	0	0	0	0	0	1	0	2	0	135	
7:45 AM	0	81	0	0	1	25	0	0	0	0	0	0	0	0	2	0	109	
7:50 AM	0	51	0	0	0	28	0	0	0	0	0	0	0	0	2	0	81	
7:55 AM	0	54	0	0	0	25	0	0	0	0	0	0	0	0	3	0	82	1642
8:00 AM	0	39	0	0	2	21	0	0	0	0	0	0	0	0	4	0	66	1591
8:05 AM	0	57	0	0	0	21	0	0	0	0	0	0	1	0	2	0	81	1549
8:10 AM	0	61	0	0	0	19	0	0	0	0	0	0	0	0	2	0	82	1493
8:15 AM	0	50	1	0	1	21	0	0	0	0	0	0	0	0	2	0	75	1420
8:20 AM	0	50	0	0	1	16	0	0	0	0	0	0	1	0	2	0	70	1293
8:25 AM	0	43	0	0	0	21	0	0	0	0	0	0	0	0	1	0	65	1176
8:30 AM	0	38	2	0	1	18	0	0	0	0	0	0	0	0	1	0	60	1053
8:35 AM	0	51	0	0	0	32	0	0	0	0	0	0	0	0	1	0	84	990
8:40 AM	0	46	0	0	1	22	0	0	0	0	0	0	0	0	0	0	69	924
8:45 AM	0	39	0	0	0	29	0	0	0	0	0	0	0	0	3	0	71	886
8:50 AM	0	44	0	0	1	23	0	0	0	0	0	0	0	0	0	0	68	873
8:55 AM	0	37	0	0	0	16	0	0	0	0	0	0	0	0	0	0	53	844

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	1080	8	0	16	1092	0	0	0	0	0	0	8	0	44	0	2248
Heavy Trucks	0	44	0		0	24	0		0	0	0		4	0	8		80
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

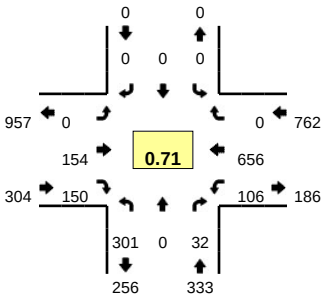
LOCATION: S Beavercreek Rd -- S Meyers Rd

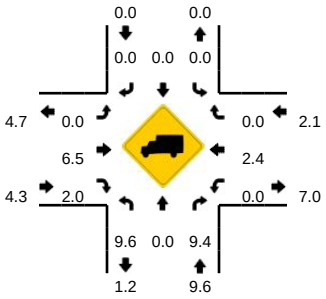
QC JOB #: 11203603

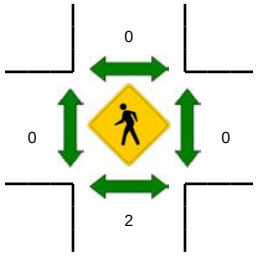
CITY/STATE: Oregon City, OR

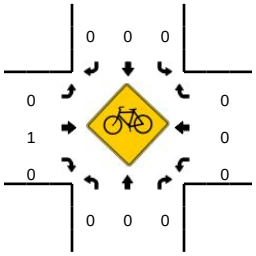
DATE: Wed, Oct 02 2013

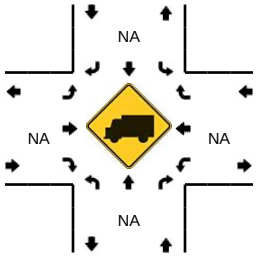
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:25 AM -- 7:40 AM

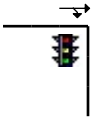


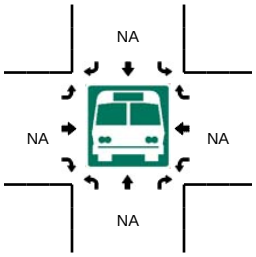












5-Min Count Period Beginning At	S Beavercreek Rd (Northbound)				S Beavercreek Rd (Southbound)				S Meyers Rd (Eastbound)				S Meyers Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	23	0	3	0	0	0	0	0	0	4	5	0	3	45	0	0	83	
7:05 AM	23	0	1	0	0	0	0	0	0	3	6	0	8	55	0	0	96	
7:10 AM	29	0	0	0	0	0	0	0	0	5	17	0	7	48	0	0	106	
7:15 AM	26	0	4	0	0	0	0	0	0	13	11	0	10	46	0	0	110	
7:20 AM	31	0	4	0	0	0	0	0	0	16	18	0	15	36	0	0	120	
7:25 AM	27	0	5	0	0	0	0	0	0	19	28	0	21	58	0	0	158	
7:30 AM	42	0	4	0	0	0	0	0	0	19	25	0	25	52	0	0	167	
7:35 AM	38	0	5	0	0	0	0	0	0	21	28	0	7	71	0	0	170	
7:40 AM	38	0	3	0	0	0	0	0	0	5	6	0	4	58	0	0	114	
7:45 AM	8	0	1	0	0	0	0	0	0	11	3	0	1	67	0	0	91	
7:50 AM	14	0	1	0	0	0	0	0	0	18	2	0	0	55	0	0	90	
7:55 AM	2	0	1	0	0	0	0	0	0	20	1	0	5	65	0	0	94	1399
8:00 AM	6	0	2	0	0	0	0	0	0	19	1	0	0	39	0	0	67	1383
8:05 AM	5	0	0	0	0	0	0	0	0	7	4	0	2	38	0	0	56	1343
8:10 AM	8	0	0	0	0	0	0	0	0	12	2	0	0	40	0	0	62	1299
8:15 AM	5	0	0	0	0	0	0	0	0	11	4	0	0	60	0	0	80	1269
8:20 AM	6	0	0	0	0	0	0	0	0	14	1	0	1	59	0	0	81	1230
8:25 AM	6	0	0	0	0	0	0	0	0	10	2	0	2	39	0	0	59	1131
8:30 AM	4	0	0	0	0	0	0	0	0	17	2	0	0	36	0	0	59	1023
8:35 AM	9	0	0	0	0	0	0	0	0	11	2	0	4	59	0	0	85	938
8:40 AM	15	0	1	0	0	0	0	0	0	22	9	0	1	47	0	0	95	919
8:45 AM	21	0	0	0	0	0	0	0	0	13	2	0	1	44	0	0	81	909
8:50 AM	10	0	2	0	0	0	0	0	0	13	7	0	3	41	0	0	76	895
8:55 AM	9	0	0	0	0	0	0	0	0	18	4	0	1	49	0	0	81	882

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	428	0	56	0	0	0	0	0	0	236	324	0	212	724	0	0	1980
Heavy Trucks	20	0	0		0	0	0		0	8	12		0	4	0		44
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

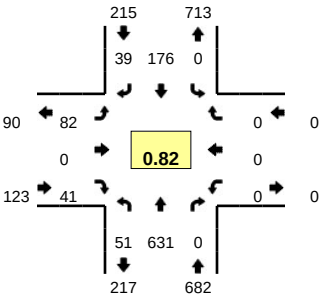
LOCATION: S Beavercreek Rd -- S Glen Oak Rd

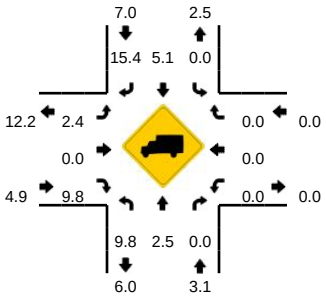
QC JOB #: 11203601

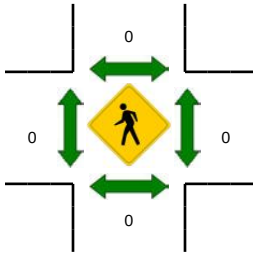
CITY/STATE: Oregon City, OR

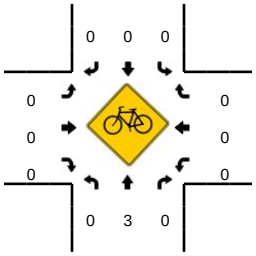
DATE: Thu, Sep 26 2013

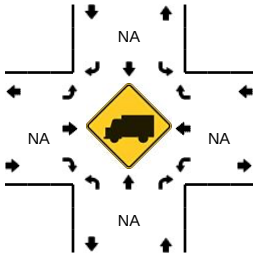
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:25 AM -- 7:40 AM

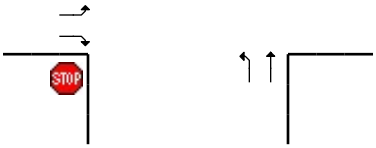


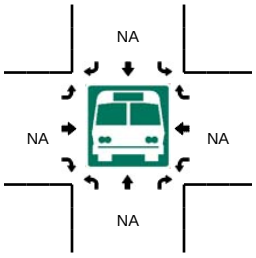












5-Min Count Period Beginning At	S Beavercreek Rd (Northbound)				S Beavercreek Rd (Southbound)				S Glen Oak Rd (Eastbound)				S Glen Oak Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	4	45	0	0	0	9	1	0	13	0	1	0	0	0	0	0	73	
7:05 AM	2	43	0	0	0	6	1	0	4	0	0	0	0	0	0	0	56	
7:10 AM	4	46	0	0	0	6	1	0	9	0	2	0	0	0	0	0	68	
7:15 AM	2	64	0	0	0	9	4	0	5	0	2	0	0	0	0	0	86	
7:20 AM	3	54	0	0	0	11	7	0	5	0	1	0	0	0	0	0	81	
7:25 AM	10	85	0	0	0	16	3	0	5	0	1	0	0	0	0	0	120	
7:30 AM	2	65	0	0	0	13	2	0	13	0	6	0	0	0	0	0	101	
7:35 AM	4	39	0	0	0	21	9	0	14	0	4	0	0	0	0	0	91	
7:40 AM	2	51	0	0	0	26	5	0	6	0	10	0	0	0	0	0	100	
7:45 AM	4	51	0	0	0	20	1	0	3	0	5	0	0	0	0	0	84	
7:50 AM	7	49	0	0	0	18	4	0	1	0	7	0	0	0	0	0	86	
7:55 AM	7	39	0	0	0	21	1	0	4	0	2	0	0	0	0	0	74	1020
8:00 AM	7	34	0	0	0	19	1	0	2	0	0	0	0	0	0	0	63	1010
8:05 AM	6	47	0	0	0	16	1	0	7	0	0	0	0	0	0	0	77	1031
8:10 AM	3	49	0	0	0	16	1	0	11	0	1	0	0	0	0	0	81	1044
8:15 AM	1	31	0	0	0	17	1	0	7	0	0	0	0	0	0	0	57	1015
8:20 AM	2	37	0	0	0	11	2	0	5	0	2	0	0	0	0	0	59	993
8:25 AM	3	39	0	0	0	14	1	0	4	0	0	0	0	0	0	0	61	934
8:30 AM	1	42	0	0	0	16	2	0	2	0	0	0	0	0	0	0	63	896
8:35 AM	0	32	0	0	0	12	2	0	6	0	0	0	0	0	0	0	52	857
8:40 AM	2	36	0	0	0	18	0	0	4	0	1	0	0	0	0	0	61	818
8:45 AM	4	32	0	0	0	15	2	0	3	0	1	0	0	0	0	0	57	791
8:50 AM	3	36	0	0	0	19	2	0	2	0	2	0	0	0	0	0	64	769
8:55 AM	1	25	0	0	0	12	0	0	6	0	0	0	0	0	0	0	44	739

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	64	756	0	0	0	200	56	0	128	0	44	0	0	0	0	0	1248
Heavy Trucks	4	12	0		0	8	4		4	0	4		0	0	0		36
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

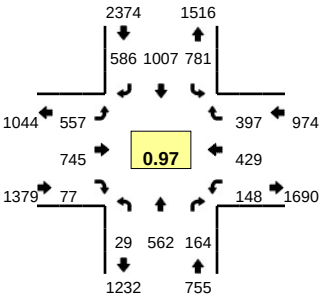
Method for determining peak hour: Total Entering Volume

LOCATION: OR 213 -- S Beavercreek Rd

QC JOB #: 11203620

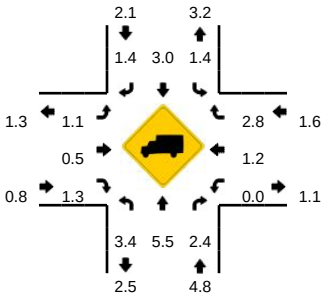
CITY/STATE: Oregon City, OR

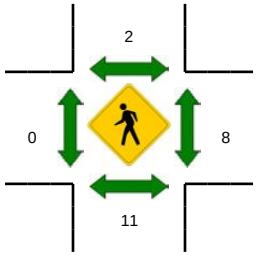
DATE: Wed, Sep 25 2013

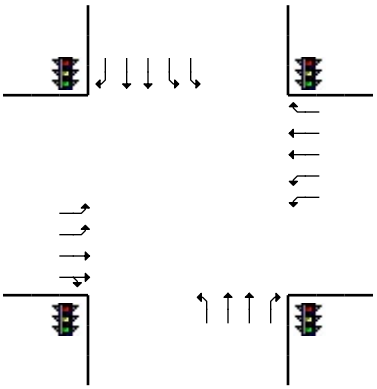


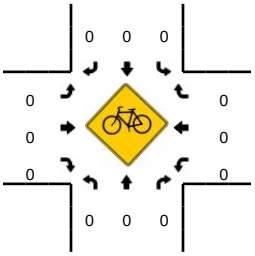
Peak-Hour: 5:00 PM -- 6:00 PM

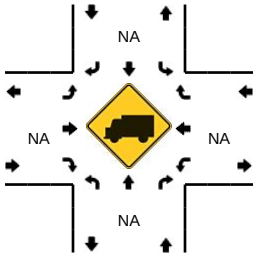
Peak 15-Min: 5:10 PM -- 5:25 PM

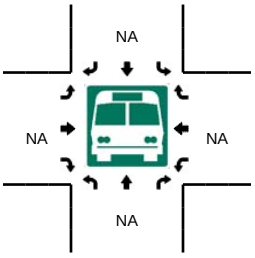












5-Min Count Period Beginning At	OR 213 (Northbound)				OR 213 (Southbound)				S Beavercreek Rd (Eastbound)				S Beavercreek Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	44	3	0	49	70	36	0	39	53	6	0	12	43	36	0	395	
4:05 PM	2	55	9	0	49	102	48	0	50	54	12	0	10	31	33	1	456	
4:10 PM	5	57	19	0	48	79	59	0	51	39	10	0	11	35	31	0	444	
4:15 PM	1	40	12	0	59	78	55	0	28	44	7	1	8	40	31	0	404	
4:20 PM	2	55	11	0	42	89	75	0	62	55	2	0	14	26	37	0	470	
4:25 PM	4	44	12	0	67	85	44	0	34	50	8	0	8	38	32	0	426	
4:30 PM	5	63	11	0	41	96	53	0	30	48	7	0	9	28	28	0	419	
4:35 PM	1	59	9	0	39	66	47	0	45	57	11	0	11	47	29	0	421	
4:40 PM	4	32	11	0	52	80	60	0	64	70	12	0	7	27	28	0	447	
4:45 PM	6	57	13	0	59	114	52	0	23	42	8	0	15	31	42	0	462	
4:50 PM	4	39	3	0	53	82	70	0	41	62	6	0	7	45	21	0	433	
4:55 PM	3	35	11	0	59	88	59	0	46	57	10	0	8	27	42	0	445	5222
5:00 PM	0	46	12	0	60	110	51	0	47	55	10	0	11	33	23	0	458	5285
5:05 PM	2	47	13	0	50	88	59	0	53	50	6	0	14	40	35	0	457	5286
5:10 PM	0	58	19	0	55	88	54	0	54	65	5	0	9	42	35	0	484	5326
5:15 PM	5	70	16	0	69	77	51	0	50	70	3	0	5	17	36	0	469	5391
5:20 PM	4	52	6	0	79	84	52	0	47	53	9	0	9	30	34	0	459	5380
5:25 PM	3	36	21	0	75	80	46	0	50	56	11	0	18	38	30	0	464	5418
5:30 PM	2	53	9	0	57	79	47	0	44	65	8	0	10	35	29	0	438	5437
5:35 PM	2	42	11	0	65	76	45	0	50	72	5	0	13	41	34	0	456	5472
5:40 PM	2	32	12	0	79	91	47	0	36	57	4	0	14	26	38	0	438	5463
5:45 PM	2	41	12	0	59	96	37	0	53	81	4	0	15	35	44	0	479	5480
5:50 PM	4	29	16	0	95	60	44	0	50	69	4	0	12	40	34	0	457	5504
5:55 PM	3	56	17	0	38	78	53	0	23	52	8	0	18	52	25	0	423	5482

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	36	720	164	0	812	996	628	0	604	752	68	0	92	356	420	0	5648
Heavy Trucks	0	28	8		12	32	20		8	4	0		0	0	16		128
Pedestrians		12				4				0				16			32
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:26 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

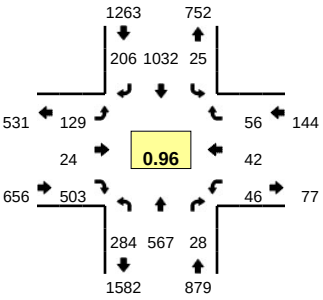
LOCATION: OR 213 -- S Molalla Ave/S Douglas Loop

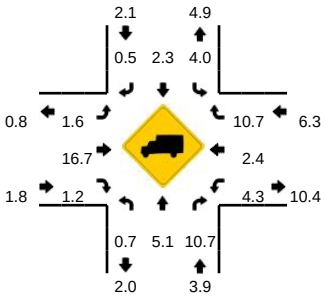
QC JOB #: 11203618

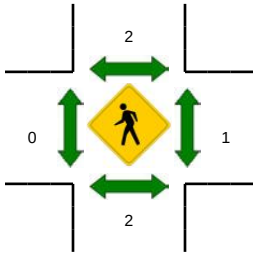
CITY/STATE: Oregon City, OR

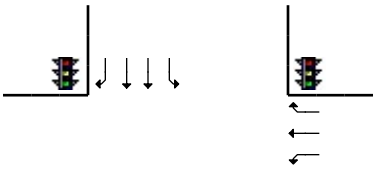
DATE: Wed, Sep 25 2013

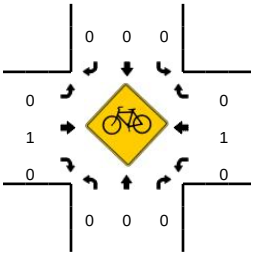
Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

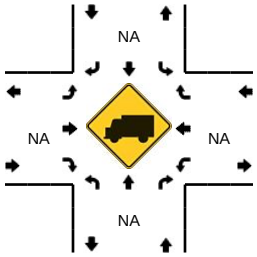


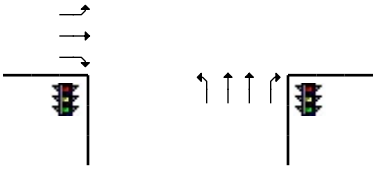


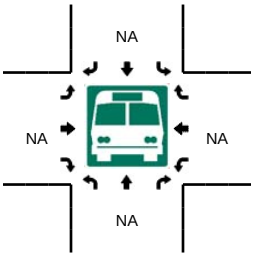












5-Min Count Period Beginning At	OR 213 (Northbound)				OR 213 (Southbound)				S Molalla Ave/S Douglas Loop (Eastbound)				S Molalla Ave/S Douglas Loop (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	22	48	0	0	1	62	9	0	5	0	44	0	4	3	7	0	205	
4:05 PM	34	37	0	0	4	69	17	0	10	4	30	0	2	3	7	0	217	
4:10 PM	19	59	2	0	0	117	16	0	13	2	39	0	5	2	10	0	284	
4:15 PM	24	53	1	0	3	66	22	0	11	4	41	0	2	2	3	0	232	
4:20 PM	24	26	1	0	1	71	9	0	8	4	49	0	3	2	3	0	201	
4:25 PM	18	46	4	0	2	77	22	0	12	1	33	0	2	3	5	0	225	
4:30 PM	17	57	2	0	1	112	18	0	11	1	32	0	4	3	2	0	260	
4:35 PM	28	61	2	0	0	58	19	0	7	1	43	0	7	6	7	0	239	
4:40 PM	24	38	0	0	3	76	14	0	15	1	51	0	2	13	2	0	239	
4:45 PM	23	52	2	0	3	77	15	0	11	2	32	0	2	3	2	0	224	
4:50 PM	33	38	2	0	2	123	20	0	6	1	35	0	2	4	8	0	274	
4:55 PM	12	12	1	0	0	75	17	0	8	5	40	0	4	6	5	0	185	2785
5:00 PM	19	53	0	0	2	118	17	0	6	0	32	0	11	3	4	0	265	2845
5:05 PM	22	36	3	0	2	83	24	0	9	2	34	0	5	9	5	0	234	2862
5:10 PM	21	46	3	0	0	80	12	0	22	3	52	0	3	7	9	0	258	2836
5:15 PM	24	66	1	0	1	96	16	0	13	0	36	0	6	4	14	0	277	2881
5:20 PM	21	49	1	0	3	68	20	0	9	2	45	0	2	3	5	0	228	2908
5:25 PM	38	44	1	0	2	85	20	0	8	1	51	0	3	1	3	0	257	2940
5:30 PM	16	52	3	0	3	99	17	0	11	1	51	0	2	2	5	0	262	2942
5:35 PM	18	40	3	0	0	85	14	0	9	3	35	0	3	3	6	0	219	2922
5:40 PM	36	43	1	1	1	65	15	0	5	2	48	0	3	3	0	0	223	2906
5:45 PM	20	41	3	0	1	73	23	0	19	6	46	0	3	1	0	0	236	2918
5:50 PM	23	42	6	0	10	99	10	0	9	3	34	0	4	3	3	0	246	2890
5:55 PM	25	55	3	0	0	81	18	0	9	1	39	0	1	3	2	0	237	2942

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	268	592	28	0	12	1036	208	0	176	20	488	0	56	80	112	0	3076
Heavy Trucks	4	28	4		0	40	0		0	4	8		0	0	12		100
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:26 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

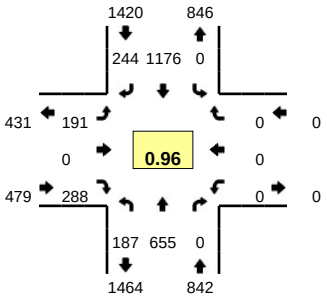
Method for determining peak hour: Total Entering Volume

LOCATION: OR 213 -- S Meyers Rd

CITY/STATE: Oregon City, OR

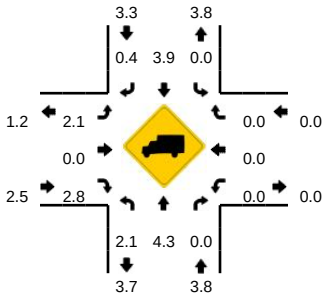
QC JOB #: 11203616

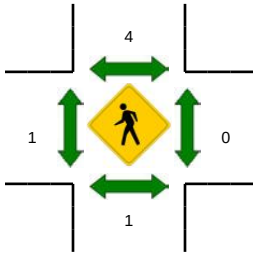
DATE: Wed, Sep 25 2013

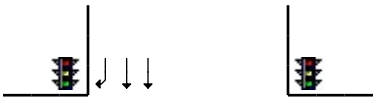


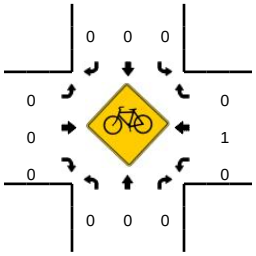
Peak-Hour: 5:00 PM -- 6:00 PM

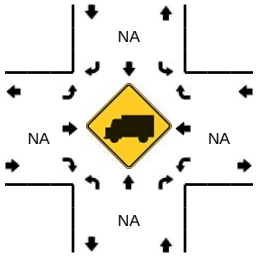
Peak 15-Min: 5:45 PM -- 6:00 PM

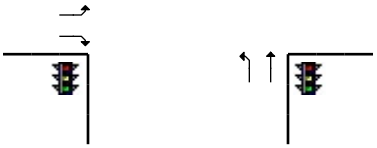


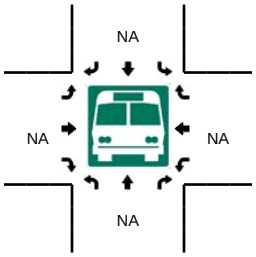












5-Min Count Period Beginning At	OR 213 (Northbound)				OR 213 (Southbound)				S Meyers Rd (Eastbound)				S Meyers Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	12	56	0	0	0	82	10	0	18	0	13	0	0	0	0	0	191	
4:05 PM	15	78	0	0	0	107	11	0	15	0	15	0	0	0	0	0	241	
4:10 PM	10	68	0	0	0	86	15	0	8	0	20	0	0	0	0	0	207	
4:15 PM	15	62	0	0	0	75	12	0	22	0	33	0	0	0	0	0	219	
4:20 PM	21	55	0	0	0	95	18	0	12	0	13	0	0	0	0	0	214	
4:25 PM	9	57	0	0	0	92	13	0	19	0	12	0	0	0	0	0	202	
4:30 PM	10	54	0	0	0	91	13	0	16	0	20	0	0	0	0	0	204	
4:35 PM	11	66	0	0	0	90	21	0	14	0	19	0	0	0	0	0	221	
4:40 PM	9	59	0	0	0	98	22	0	19	0	21	0	0	0	0	0	228	
4:45 PM	6	57	0	0	0	105	16	0	13	0	14	0	0	0	0	0	211	
4:50 PM	11	49	0	0	0	108	17	0	14	0	14	0	0	0	0	0	213	
4:55 PM	8	59	0	0	0	118	19	0	14	0	18	0	0	0	0	0	236	2587
5:00 PM	10	42	0	0	0	107	21	0	16	0	15	0	0	0	0	0	211	2607
5:05 PM	12	47	0	0	0	89	20	0	20	0	22	0	0	0	0	0	210	2576
5:10 PM	12	67	0	0	0	115	16	0	14	0	17	0	0	0	0	0	241	2610
5:15 PM	9	55	0	0	0	96	9	0	13	0	23	0	0	0	0	0	205	2596
5:20 PM	6	69	0	0	0	111	16	0	19	0	21	0	0	0	0	0	242	2624
5:25 PM	22	51	0	0	0	109	21	0	21	0	23	0	0	0	0	0	247	2669
5:30 PM	5	55	0	0	0	102	23	0	6	0	18	0	0	0	0	0	209	2674
5:35 PM	17	52	0	0	0	105	23	0	19	0	32	0	0	0	0	0	248	2701
5:40 PM	29	56	0	0	0	66	19	0	13	0	30	0	0	0	0	0	213	2686
5:45 PM	22	64	0	0	0	107	22	0	14	0	24	0	0	0	0	0	253	2728
5:50 PM	18	52	0	0	0	91	36	0	14	0	29	0	0	0	0	0	240	2755
5:55 PM	25	45	0	0	0	78	18	0	22	0	34	0	0	0	0	0	222	2741

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	260	644	0	0	0	1104	304	0	200	0	348	0	0	0	0	0	2860
Heavy Trucks	4	40	0		0	60	0		4	0	8		0	0	0		116
Pedestrians		0				4				4				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:26 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

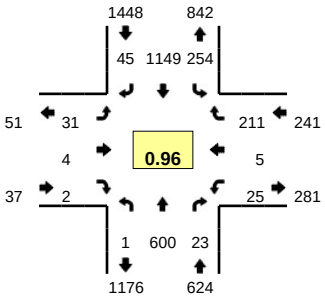
LOCATION: OR 213 -- S Caufield Rd/S Glen Oak Rd

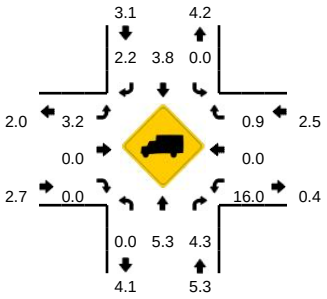
QC JOB #: 11203614

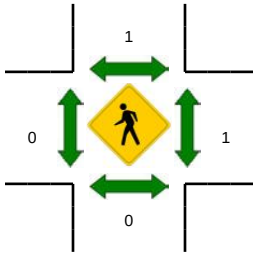
CITY/STATE: Oregon City, OR

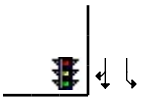
DATE: Wed, Sep 25 2013

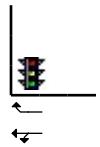
Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:35 PM -- 5:50 PM

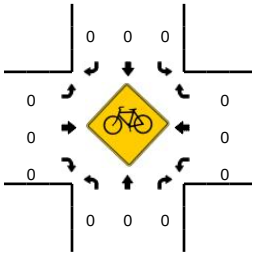


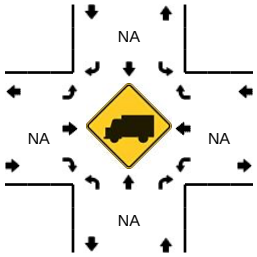


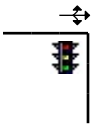


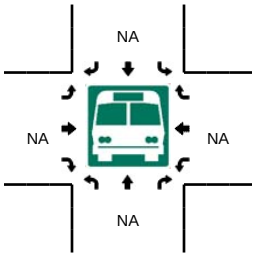












5-Min Count Period Beginning At	OR 213 (Northbound)				OR 213 (Southbound)				S Caufield Rd/S Glen Oak Rd (Eastbound)				S Caufield Rd/S Glen Oak Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	70	1	0	13	88	2	0	2	0	0	0	0	0	9	0	187	
4:05 PM	1	55	2	0	14	85	2	0	0	0	0	0	3	1	18	0	181	
4:10 PM	0	71	0	0	14	86	4	0	5	0	1	0	1	0	13	0	195	
4:15 PM	1	55	2	0	18	74	5	0	4	0	0	0	7	0	15	0	181	
4:20 PM	1	50	2	0	17	96	2	0	2	0	0	0	3	0	16	0	189	
4:25 PM	0	48	1	0	13	81	4	0	5	0	0	0	2	0	7	0	161	
4:30 PM	1	46	0	0	10	85	3	0	6	0	0	0	1	1	10	0	163	
4:35 PM	0	59	2	0	17	107	1	0	3	0	0	0	0	0	13	0	202	
4:40 PM	0	50	1	0	11	101	1	0	5	0	0	0	1	0	15	0	185	
4:45 PM	0	48	0	0	21	89	7	0	2	0	0	0	0	0	10	0	177	
4:50 PM	0	56	3	0	17	101	4	0	5	0	0	0	0	1	10	0	197	
4:55 PM	0	50	1	0	14	109	3	0	0	0	0	0	3	0	10	0	190	2208
5:00 PM	1	43	0	0	10	88	3	0	2	0	0	0	4	0	8	0	159	2180
5:05 PM	0	60	3	0	20	101	4	0	3	0	0	0	2	1	10	0	204	2203
5:10 PM	0	53	2	0	25	106	2	0	1	0	0	0	0	0	17	0	206	2214
5:15 PM	0	46	0	0	17	91	3	0	1	0	0	0	2	2	12	0	174	2207
5:20 PM	0	62	3	0	25	105	3	0	4	0	0	0	0	0	17	0	219	2237
5:25 PM	0	45	1	0	20	101	4	0	3	0	0	0	2	2	14	0	192	2268
5:30 PM	0	46	3	0	16	98	5	0	3	0	0	0	5	0	12	0	188	2293
5:35 PM	0	47	2	0	27	97	5	0	5	1	1	0	0	0	20	0	205	2296
5:40 PM	0	62	1	0	18	90	5	0	5	0	0	0	3	0	21	0	205	2316
5:45 PM	0	46	5	0	22	96	4	0	3	1	0	0	2	0	26	0	205	2344
5:50 PM	0	44	3	0	24	86	2	0	1	2	1	0	4	0	31	0	198	2345
5:55 PM	0	46	0	0	30	90	5	0	0	0	0	0	1	0	23	0	195	2350

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	620	32	0	268	1132	56	0	52	8	4	0	20	0	268	0	2460
Heavy Trucks	0	56	0		0	36	0		4	0	0		0	0	0		96
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:26 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

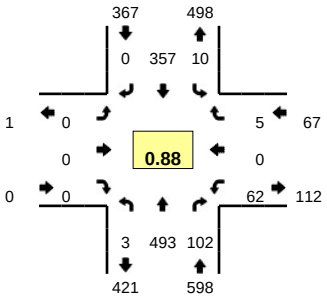
Method for determining peak hour: Total Entering Volume

LOCATION: S Maple Lane Rd -- S Thayer Rd

QC JOB #: 11203612

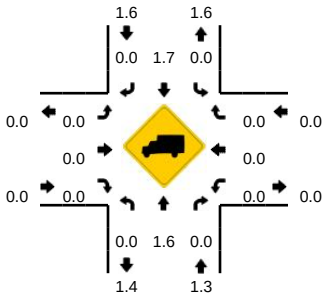
CITY/STATE: Oregon City, OR

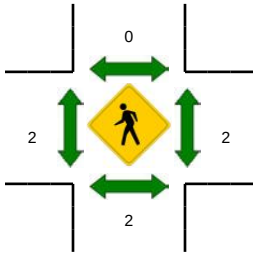
DATE: Wed, Sep 25 2013

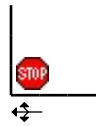


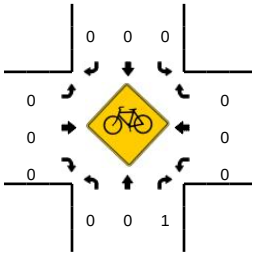
Peak-Hour: 5:00 PM -- 6:00 PM

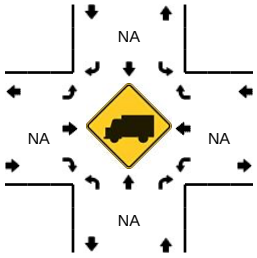
Peak 15-Min: 5:40 PM -- 5:55 PM

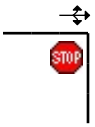


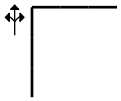


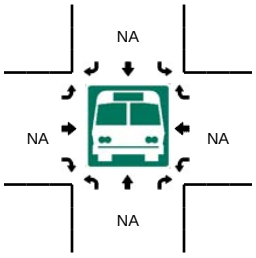












5-Min Count Period Beginning At	S Maple Lane Rd (Northbound)				S Maple Lane Rd (Southbound)				S Thayer Rd (Eastbound)				S Thayer Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	23	7	0	0	38	0	0	0	0	0	0	10	0	0	0	78	
4:05 PM	0	34	3	0	0	33	0	0	0	0	0	0	2	0	0	0	72	
4:10 PM	0	33	8	0	1	29	0	0	0	0	0	0	2	0	0	0	73	
4:15 PM	0	28	8	0	0	25	0	0	0	0	0	0	7	0	0	0	68	
4:20 PM	0	36	8	0	0	32	0	0	0	0	0	0	5	0	0	0	81	
4:25 PM	0	37	8	0	0	33	0	0	0	0	0	0	7	0	0	0	85	
4:30 PM	0	34	5	0	4	29	0	0	0	0	0	0	2	0	0	0	74	
4:35 PM	0	38	5	0	0	28	0	0	0	0	0	0	9	0	0	0	80	
4:40 PM	0	27	6	0	0	34	0	0	0	0	0	0	7	0	0	0	74	
4:45 PM	0	31	6	1	1	33	1	0	0	0	0	0	5	0	0	0	78	
4:50 PM	1	44	5	0	0	22	0	0	0	0	2	0	3	0	1	0	78	
4:55 PM	0	29	10	0	0	15	0	0	0	0	0	0	8	0	0	0	62	903
5:00 PM	0	41	7	0	0	21	0	0	0	0	0	0	3	0	0	0	72	897
5:05 PM	0	38	15	0	0	32	0	0	0	0	0	0	3	0	2	0	90	915
5:10 PM	0	51	9	0	0	27	0	0	0	0	0	0	4	0	0	0	91	933
5:15 PM	0	46	5	0	1	19	0	0	0	0	0	0	6	0	1	0	78	943
5:20 PM	1	36	9	1	1	26	0	0	0	0	0	0	3	0	2	0	79	941
5:25 PM	0	42	4	0	2	22	0	0	0	0	0	0	8	0	0	0	78	934
5:30 PM	0	39	8	0	0	45	0	0	0	0	0	0	5	0	0	0	97	957
5:35 PM	0	32	5	0	2	28	0	0	0	0	0	0	5	0	0	0	72	949
5:40 PM	0	34	19	0	0	43	0	0	0	0	0	0	7	0	0	0	103	978
5:45 PM	0	45	6	0	1	36	0	0	0	0	0	0	7	0	0	0	95	995
5:50 PM	0	49	11	1	2	25	0	0	0	0	0	0	6	0	0	0	94	1011
5:55 PM	0	40	4	0	1	33	0	0	0	0	0	0	5	0	0	0	83	1032

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	512	144	4	12	416	0	0	0	0	0	0	80	0	0	0	1168
Heavy Trucks	0	4	0		0	0	0		0	0	0		0	0	0		4
Pedestrians		8				0				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:26 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

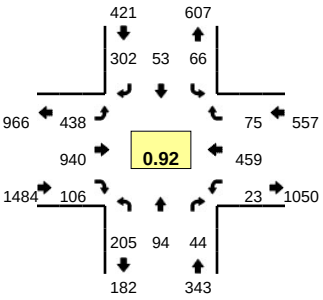
LOCATION: S Maple Lane Rd -- S Beavercreek Rd

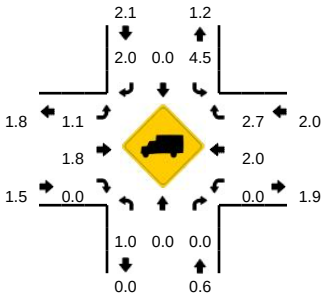
QC JOB #: 11203610

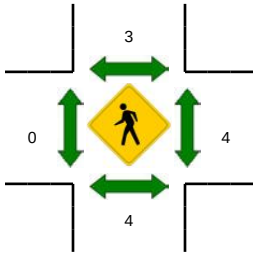
CITY/STATE: Oregon City, OR

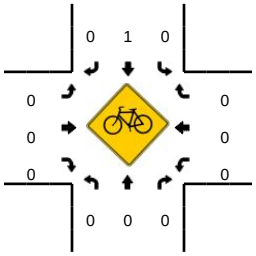
DATE: Wed, Sep 25 2013

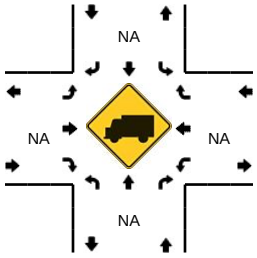
Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:40 PM -- 5:55 PM

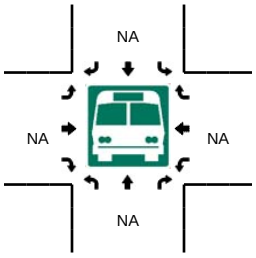












5-Min Count Period Beginning At	S Maple Lane Rd (Northbound)				S Maple Lane Rd (Southbound)				S Beavercreek Rd (Eastbound)				S Beavercreek Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	15	6	4	0	5	10	34	0	14	52	8	0	1	37	5	0	191	
4:05 PM	16	6	1	0	5	2	21	0	29	75	7	0	0	39	7	0	208	
4:10 PM	21	1	2	0	10	7	19	0	28	52	5	0	1	47	5	0	198	
4:15 PM	19	8	6	0	4	4	24	0	27	59	6	0	0	22	2	0	181	
4:20 PM	13	4	3	0	5	2	28	0	34	56	7	0	0	44	11	0	207	
4:25 PM	20	10	3	0	9	6	31	0	26	54	6	0	0	35	6	0	206	
4:30 PM	6	5	7	0	1	2	27	0	34	78	5	0	2	37	2	0	206	
4:35 PM	10	6	6	0	1	2	29	0	34	66	7	0	1	26	4	0	192	
4:40 PM	8	8	2	0	9	7	24	0	21	59	8	0	1	41	0	0	188	
4:45 PM	20	7	2	0	2	7	29	0	40	49	11	0	2	41	3	0	213	
4:50 PM	6	5	6	0	5	5	19	0	34	66	8	0	1	31	6	0	192	
4:55 PM	20	6	3	0	1	2	20	0	21	54	8	0	2	50	4	0	191	2373
5:00 PM	14	13	5	0	3	4	18	0	45	68	9	0	1	34	5	0	219	2401
5:05 PM	15	8	5	0	5	6	23	0	35	73	7	0	2	42	8	0	229	2422
5:10 PM	16	8	1	0	4	2	25	0	40	70	13	0	1	43	5	0	228	2452
5:15 PM	17	7	1	0	5	3	16	0	35	84	14	0	4	40	8	0	234	2505
5:20 PM	21	4	4	0	1	6	21	0	36	66	6	0	1	40	8	0	214	2512
5:25 PM	17	3	6	0	7	7	24	0	35	82	6	0	2	31	8	0	228	2534
5:30 PM	11	9	5	0	8	6	37	0	37	71	9	0	2	28	2	0	225	2553
5:35 PM	19	2	2	0	6	3	19	0	35	97	8	0	1	35	5	0	232	2593
5:40 PM	10	6	6	0	5	3	36	0	35	93	10	0	2	37	8	0	251	2656
5:45 PM	32	12	0	0	7	6	31	0	31	68	8	0	1	46	5	0	247	2690
5:50 PM	21	9	3	0	7	2	22	0	43	93	8	0	6	45	9	0	268	2766
5:55 PM	12	13	6	0	8	5	30	0	31	75	8	0	0	38	4	0	230	2805

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	252	108	36	0	76	44	356	0	436	1016	104	0	36	512	88	0	3064
Heavy Trucks	0	0	0		4	0	4		4	20	0		0	0	0		32
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:26 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

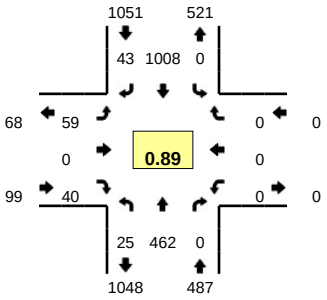
Method for determining peak hour: Total Entering Volume

LOCATION: S Beavercreek Rd -- Clairmont Dr

QC JOB #: 11203608

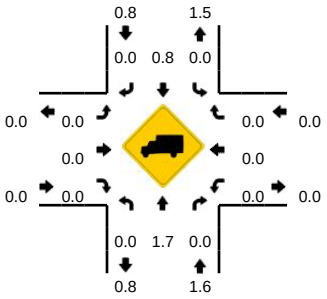
CITY/STATE: Oregon City, OR

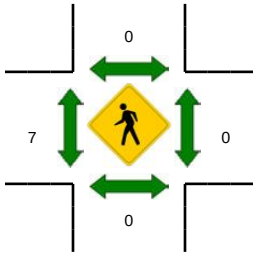
DATE: Wed, Sep 25 2013

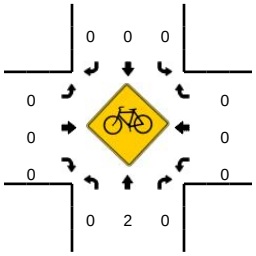


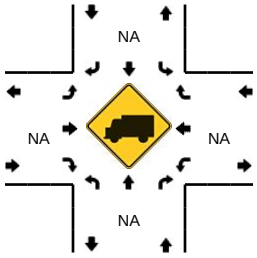
Peak-Hour: 5:00 PM -- 6:00 PM

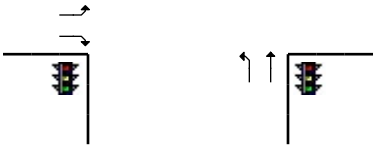
Peak 15-Min: 5:40 PM -- 5:55 PM

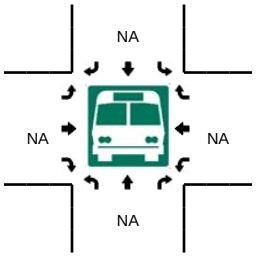












5-Min Count Period Beginning At	S Beavercreek Rd (Northbound)				S Beavercreek Rd (Southbound)				Clairmont Dr (Eastbound)				Clairmont Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	38	0	0	0	66	1	0	5	0	3	0	0	0	0	0	113	
4:05 PM	1	27	0	0	0	71	2	0	2	0	4	0	0	0	0	0	107	
4:10 PM	1	34	0	0	0	66	1	0	4	0	0	0	0	0	0	0	106	
4:15 PM	1	34	0	0	0	65	7	0	3	0	2	0	0	0	0	0	112	
4:20 PM	0	43	0	0	0	61	0	0	7	0	2	0	0	0	0	0	113	
4:25 PM	1	27	0	0	0	56	4	0	9	0	2	0	0	0	0	0	99	
4:30 PM	1	35	0	0	0	63	1	0	5	0	4	0	0	0	0	0	109	
4:35 PM	1	26	0	0	0	83	3	1	6	0	2	0	0	0	0	0	122	
4:40 PM	1	36	0	0	0	71	2	0	5	0	3	0	0	0	0	0	118	
4:45 PM	2	31	0	0	0	53	4	0	4	0	6	0	0	0	0	0	100	
4:50 PM	2	35	0	0	0	71	0	0	7	0	3	0	0	0	0	0	118	
4:55 PM	0	38	0	0	0	63	2	0	13	0	4	0	0	0	0	0	120	1337
5:00 PM	0	33	0	0	0	75	3	0	8	0	5	0	0	0	0	0	124	1348
5:05 PM	2	38	0	0	0	77	3	0	7	0	4	0	0	0	0	0	131	1372
5:10 PM	1	25	0	0	0	73	0	0	10	0	3	0	0	0	0	0	112	1378
5:15 PM	1	43	0	0	0	81	4	0	10	0	3	0	0	0	0	0	142	1408
5:20 PM	0	45	0	0	0	80	2	0	2	0	2	0	0	0	0	0	131	1426
5:25 PM	0	30	0	0	0	95	5	0	1	0	5	0	0	0	0	0	136	1463
5:30 PM	1	32	0	0	0	73	4	0	5	0	1	0	0	0	0	0	116	1470
5:35 PM	11	38	0	0	0	94	5	0	5	0	1	0	0	0	0	0	154	1502
5:40 PM	2	44	0	0	0	94	4	0	3	0	4	0	0	0	0	0	151	1535
5:45 PM	1	52	0	0	0	94	3	0	2	0	3	0	0	0	0	0	155	1590
5:50 PM	1	41	0	0	0	97	7	0	4	0	6	0	0	0	0	0	156	1628
5:55 PM	5	41	0	0	0	75	3	0	2	0	3	0	0	0	0	0	129	1637

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	548	0	0	0	1140	56	0	36	0	52	0	0	0	0	0	1848
Heavy Trucks	0	0	0		0	16	0		0	0	0		0	0	0		16
Pedestrians		0				0				8				0			8
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:26 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

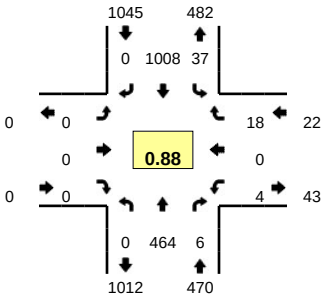
LOCATION: S Beavercreek Rd -- S Loder Rd

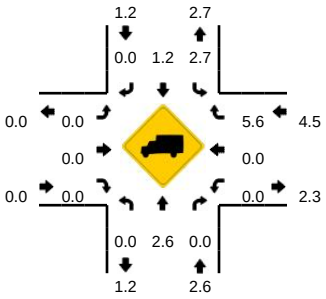
QC JOB #: 11203606

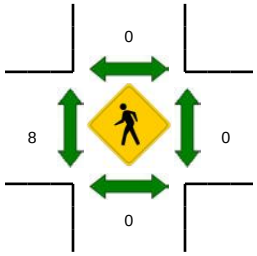
CITY/STATE: Oregon City, OR

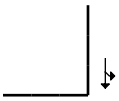
DATE: Wed, Sep 25 2013

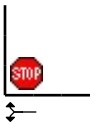
Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:40 PM -- 5:55 PM

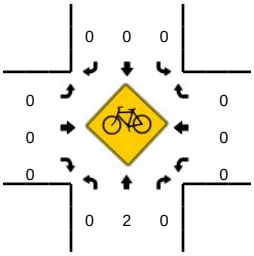


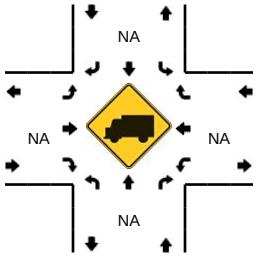


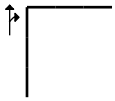


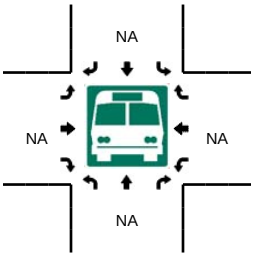












5-Min Count Period Beginning At	S Beavercreek Rd (Northbound)				S Beavercreek Rd (Southbound)				S Loder Rd (Eastbound)				S Loder Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	35	0	0	2	67	0	0	0	0	0	0	0	0	3	0	107	
4:05 PM	0	29	0	0	1	73	0	0	0	0	0	0	0	0	3	0	106	
4:10 PM	0	32	0	0	3	63	0	0	0	0	0	0	0	0	0	0	98	
4:15 PM	0	33	0	0	2	65	0	0	0	0	0	0	1	0	1	0	102	
4:20 PM	0	46	0	0	3	58	0	0	0	0	0	0	0	0	2	0	109	
4:25 PM	0	24	1	0	5	57	0	0	0	0	0	0	0	0	2	0	89	
4:30 PM	0	35	0	0	4	65	0	0	0	0	0	0	0	0	4	0	108	
4:35 PM	0	25	0	0	3	78	0	0	0	0	0	0	0	0	3	0	109	
4:40 PM	0	40	0	0	3	77	0	0	0	0	0	0	0	0	0	0	120	
4:45 PM	0	37	0	0	1	60	0	0	0	0	0	0	2	0	1	0	101	
4:50 PM	0	32	0	0	2	68	0	0	0	0	0	0	0	0	0	0	102	
4:55 PM	0	41	0	0	2	66	0	0	0	0	0	0	0	0	1	0	110	1261
5:00 PM	0	33	0	0	3	80	0	0	0	0	0	0	0	0	1	0	117	1271
5:05 PM	0	30	1	0	3	76	0	0	0	0	0	0	0	0	1	0	111	1276
5:10 PM	0	33	0	0	5	60	0	0	0	0	0	0	0	0	1	0	99	1277
5:15 PM	0	38	1	0	3	93	0	0	0	0	0	0	0	0	3	0	138	1313
5:20 PM	0	42	0	0	2	75	0	0	0	0	0	0	0	0	2	0	121	1325
5:25 PM	0	29	1	0	0	105	0	0	0	0	0	0	3	0	2	0	140	1376
5:30 PM	0	32	1	0	3	76	0	0	0	0	0	0	1	0	1	0	114	1382
5:35 PM	0	49	1	0	3	87	0	0	0	0	0	0	0	0	0	0	140	1413
5:40 PM	0	46	0	0	3	82	0	0	0	0	0	0	0	0	1	0	132	1425
5:45 PM	0	50	1	0	7	99	0	0	0	0	0	0	0	0	2	0	159	1483
5:50 PM	0	45	0	0	2	98	0	0	0	0	0	0	0	0	2	0	147	1528
5:55 PM	0	37	0	0	3	77	0	0	0	0	0	0	0	0	2	0	119	1537

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	564	4	0	48	1116	0	0	0	0	0	0	0	0	20	0	1752
Heavy Trucks	0	4	0		0	20	0		0	0	0		0	0	0		24
Pedestrians		0				0				8				0			8
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:26 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

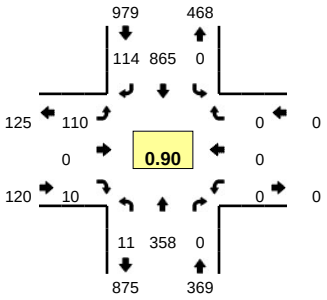
Method for determining peak hour: Total Entering Volume

LOCATION: S Beavercreek Rd -- S Meyers Rd

QC JOB #: 11203604

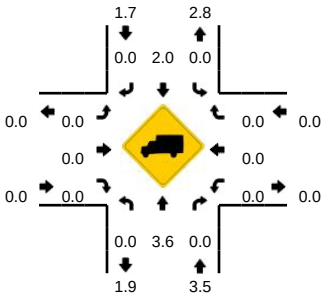
CITY/STATE: Oregon City, OR

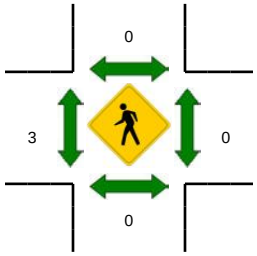
DATE: Wed, Sep 25 2013

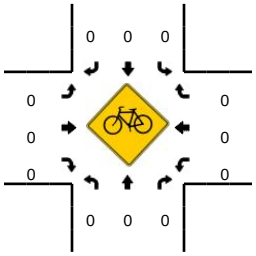


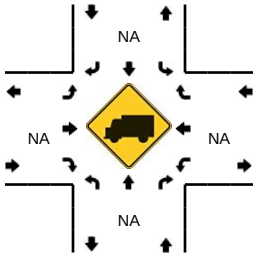
Peak-Hour: 5:00 PM -- 6:00 PM

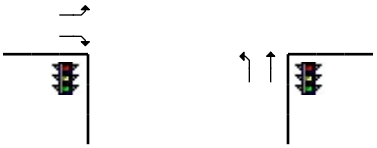
Peak 15-Min: 5:45 PM -- 6:00 PM

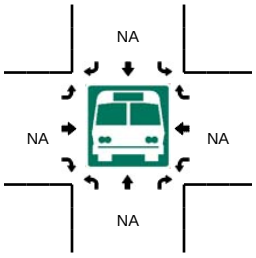












5-Min Count Period Beginning At	S Beavercreek Rd (Northbound)				S Beavercreek Rd (Southbound)				S Meyers Rd (Eastbound)				S Meyers Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	27	0	0	0	50	2	0	7	0	0	0	0	0	0	0	88	
4:05 PM	0	19	0	0	0	60	7	0	11	0	0	0	0	0	0	0	97	
4:10 PM	1	27	0	0	0	44	7	0	8	0	1	0	0	0	0	0	88	
4:15 PM	2	20	0	0	0	67	7	0	10	0	2	0	0	0	0	0	108	
4:20 PM	0	36	0	0	0	53	7	0	10	0	2	0	0	0	0	0	108	
4:25 PM	0	21	0	0	0	47	12	0	2	0	1	0	0	0	0	0	83	
4:30 PM	2	33	0	0	0	63	8	0	3	0	1	0	0	0	0	0	110	
4:35 PM	0	16	0	0	0	62	9	0	7	0	2	0	0	0	0	0	96	
4:40 PM	1	31	0	0	0	53	12	0	9	0	1	0	0	0	0	0	107	
4:45 PM	0	31	0	0	0	56	6	0	5	0	2	0	0	0	0	0	100	
4:50 PM	0	27	0	0	0	61	9	0	5	0	1	0	0	0	0	0	103	
4:55 PM	0	30	0	0	0	49	7	0	9	0	0	0	0	0	0	0	95	1183
5:00 PM	0	25	0	0	0	65	15	0	7	0	0	0	0	0	0	0	112	1207
5:05 PM	0	27	0	0	0	78	2	0	5	0	0	0	0	0	0	0	112	1222
5:10 PM	0	31	0	0	0	64	4	0	1	0	0	0	0	0	0	0	100	1234
5:15 PM	0	37	0	0	0	72	9	0	2	0	1	0	0	0	0	0	121	1247
5:20 PM	0	35	0	0	0	58	3	0	7	0	2	0	0	0	0	0	105	1244
5:25 PM	1	25	0	0	0	93	15	0	6	0	0	0	0	0	0	0	140	1301
5:30 PM	1	28	0	0	0	66	9	0	10	0	1	0	0	0	0	0	115	1306
5:35 PM	0	26	0	0	0	73	11	0	17	0	0	0	0	0	0	0	127	1337
5:40 PM	3	32	0	0	0	69	8	0	16	0	2	0	0	0	0	0	130	1360
5:45 PM	1	34	0	0	0	82	14	0	15	0	0	0	0	0	0	0	146	1406
5:50 PM	2	31	0	0	0	59	13	0	13	0	3	0	0	0	0	0	121	1424
5:55 PM	3	27	0	0	0	86	11	0	11	0	1	0	0	0	0	0	139	1468

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	24	368	0	0	0	908	152	0	156	0	16	0	0	0	0	0	1624
Heavy Trucks	0	12	0		0	20	0		0	0	0		0	0	0		32
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:26 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

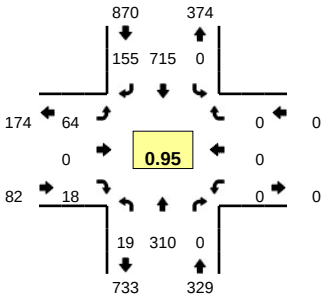
LOCATION: S Beavercreek Rd -- S Glen Oak Rd

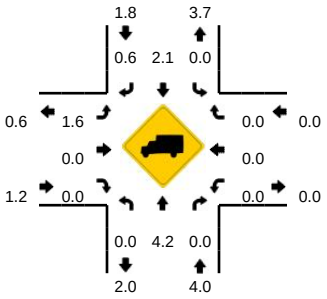
QC JOB #: 11203602

CITY/STATE: Oregon City, OR

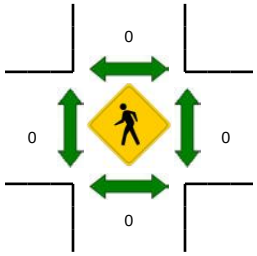
DATE: Wed, Sep 25 2013

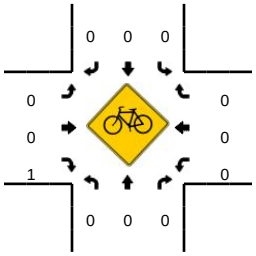
Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:35 PM -- 5:50 PM

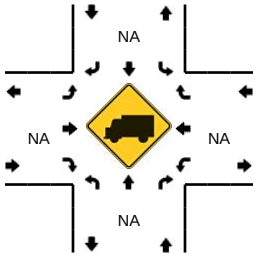


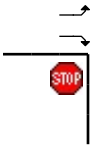


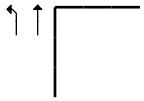
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

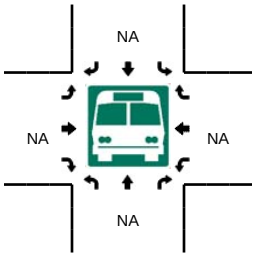












5-Min Count Period Beginning At	S Beavercreek Rd (Northbound)				S Beavercreek Rd (Southbound)				S Glen Oak Rd (Eastbound)				S Glen Oak Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	27	0	0	0	41	13	0	3	0	2	0	0	0	0	0	87	
4:05 PM	0	17	0	0	0	46	11	0	1	0	2	0	0	0	0	0	77	
4:10 PM	1	27	0	0	0	41	6	0	1	0	4	0	0	0	0	0	80	
4:15 PM	4	31	0	0	0	61	6	0	1	0	1	0	0	0	0	0	104	
4:20 PM	5	20	0	0	0	50	9	0	6	0	3	0	0	0	0	0	93	
4:25 PM	0	25	0	0	0	37	10	0	2	0	3	0	0	0	0	0	77	
4:30 PM	2	24	0	0	0	53	6	0	4	0	1	0	0	0	0	0	90	
4:35 PM	0	18	0	0	0	53	13	0	2	0	0	0	0	0	0	0	86	
4:40 PM	3	32	0	0	0	47	10	0	2	0	3	0	0	0	0	0	97	
4:45 PM	0	23	0	0	0	48	6	0	5	0	2	0	0	0	0	0	84	
4:50 PM	3	25	0	0	0	54	12	0	1	0	0	0	0	0	0	0	95	
4:55 PM	1	24	0	0	0	36	10	0	4	0	1	0	0	0	0	0	76	1046
5:00 PM	0	27	0	0	0	54	15	0	4	0	0	0	0	0	0	0	100	1059
5:05 PM	0	20	0	0	0	65	10	0	7	0	0	0	0	0	0	0	102	1084
5:10 PM	0	27	0	0	0	50	12	0	4	0	2	0	0	0	0	0	95	1099
5:15 PM	1	24	0	0	0	67	8	0	11	0	2	0	0	0	0	0	113	1108
5:20 PM	3	30	0	0	0	46	11	0	5	0	3	0	0	0	0	0	98	1113
5:25 PM	1	21	0	0	0	77	14	0	4	0	0	0	0	0	0	0	117	1153
5:30 PM	6	24	0	0	0	55	13	0	3	0	2	0	0	0	0	0	103	1166
5:35 PM	1	22	0	0	0	62	8	0	7	0	1	0	0	0	0	0	101	1181
5:40 PM	1	29	0	0	0	67	11	0	5	0	3	0	0	0	0	0	116	1200
5:45 PM	5	32	0	0	0	58	20	0	4	0	1	0	0	0	0	0	120	1236
5:50 PM	1	29	0	0	0	50	10	0	4	0	1	0	0	0	0	0	95	1236
5:55 PM	0	25	0	0	0	64	23	0	6	0	3	0	0	0	0	0	121	1281

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	28	332	0	0	0	748	156	0	64	0	20	0	0	0	0	0	1348
Heavy Trucks	0	0	0		0	12	0		0	0	0		0	0	0		12
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/4/2013 1:26 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Attachment B

Description of Level-of-Service Methods and Criteria

LEVEL OF SERVICE CONCEPT

Level of service (level of service) is a concept developed to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or roadway segment. Six grades are used to denote the various Level of Service from A to F.[3]

SIGNALIZED INTERSECTIONS

The six level of service grades are described qualitatively for signalized intersections in Table B1. Additionally, Table B2 identifies the relationship between level of service and average control delay per vehicle. Control delay is defined to include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Using this definition, Level of Service D is generally considered to represent the minimum acceptable design standard.

Table B1
Level of Service Definitions (Signalized Intersections)

Level of Service	Average Delay per Vehicle
A	Very low average control delay, less than 10 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Average control delay is greater than 10 seconds per vehicle and less than or equal to 20 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for a level of service A, causing higher levels of average delay.
C	Average control delay is greater than 20 seconds per vehicle and less than or equal to 35 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Average control delay is greater than 35 seconds per vehicle and less than or equal to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle length, or high volume/capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Average control delay is greater than 55 seconds per vehicle and less than or equal to 80 seconds per vehicle. This is usually considered to be the limit of acceptable delay. These high delay values generally (but not always) indicate poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences.
F	Average control delay is in excess of 80 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation. It may also occur at high volume/capacity ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such high delay values.

3 Most of the material in this appendix is adapted from the Transportation Research Board, *Highway Capacity Manual*, (2000).

Table B2
Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	≤10.0
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

UNSIGNALIZED INTERSECTIONS

Unsignalized intersections include two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections. The *1997 Highway Capacity Manual* provides new models for estimating control delay at both TWSC and AWSC intersections. A qualitative description of the various service levels associated with an unsignalized intersection is presented in Table B3. A quantitative definition of level of service for unsignalized intersections is presented in Table B4. Using this definition, Level of Service E is generally considered to represent the minimum acceptable design standard.

Table B3
Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Delay per Vehicle to Minor Street
A	• Nearly all drivers find freedom of operation. • Very seldom is there more than one vehicle in queue.
B	• Some drivers begin to consider the delay an inconvenience. • Occasionally there is more than one vehicle in queue.
C	• Many times there is more than one vehicle in queue. • Most drivers feel restricted, but not objectionably so.
D	• Often there is more than one vehicle in queue. • Drivers feel quite restricted.
E	• Represents a condition in which the demand is near or equal to the probable maximum number of vehicles that can be accommodated by the movement. • There is almost always more than one vehicle in queue. • Drivers find the delays approaching intolerable levels.
F	• Forced flow. • Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection.

Table B4
Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

It should be noted that the level of service criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, there are a number of driver behavior considerations that combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, while drivers on the minor street approaches to TWSC intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections than signalized intersections. For these reasons, it is considered that the control delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. **While overall intersection level of service is calculated for AWSC intersections, level of service is only calculated for the minor approaches and the major street left turn movements at TWSC intersections.** No delay is assumed to the major street through movements. For TWSC intersections, the overall intersection level of service remains undefined: level-of-service is only calculated for each minor street lane.

In the performance evaluation of TWSC intersections, it is important to consider other measures of effectiveness (MOE's) in addition to delay, such as v/c ratios for individual movements, average queue lengths, and 95th-percentile queue lengths. By focusing on a single MOE for the worst movement only, such as delay for the minor-street left turn, users may make inappropriate traffic control decisions. The potential for making such inappropriate decisions is likely to be particularly pronounced when the HCM level-of-service thresholds are adopted as legal standards, as is the case in many public agencies.

Attachment C

Year 2013 Existing Conditions
Level-of-Service Worksheets

Beavercreek Mixed-use residential
Project No. 13700

Saturation flow rate review of the Beavercreek/OR 213 intersection during the weekday a.m. peak hour

7:25 a.m. = 2:54:40 time stamp in the video recorded data

WBR Sat flow Study

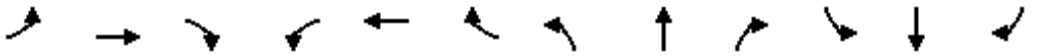
Note that beginning observe time reflects the time in which the fifth vehicle in the queue crosses the stop bar

Beg Observe	End Sat Flow	Green Time	Seconds	No. Veh.	Sat Flow	
2:54:47	*2:55:25*	*00:38.0*	*38*	*16*	*1516*	
2:56:30	*2:56:45*	*00:15.0*	*15*	*7*	*1680*	
2:57:00	*2:57:28*	*00:28.0*	*28*	*13*	*1671*	
2:57:38	*2:57:54*	*00:16.0*	*16*	*7*	*1575*	
2:58:48	*2:58:55*	*00:07.0*	*7*	*4*	*2057*	queue clears after 8 vehicles
2:59:50	*3:00:27*	*00:37.0*	*37*	*15*	*1459*	
3:01:28	*3:01:50*	*00:22.0*	*22*	*10*	*1636*	
3:02:08	*3:02:25*	*00:17.0*	*17*	*8*	*1694*	
3:03:42	*3:03:59*	*00:17.0*	*17*	*8*	*1694*	
3:04:28	*3:04:46*	*00:18.0*	*18*	*9*	*1800*	
3:06:05	*3:06:31*	*00:26.0*	*26*	*13*	*1800*	
3:07:02	*3:07:44*	*00:42.0*	*42*	*19*	*1629*	
3:08:37	*3:09:00*	*00:23.0*	*23*	*12*	*1878*	
3:09:39	*3:10:05*	*00:26.0*	*26*	*14*	*1938*	
				Average =	1716	
				Synchro Sat Flow Adjustment	**2100**	

NBT Sat flow Study

Note that beginning observe time reflects the time in which the fifth vehicle in the queue crosses the stop bar

Beg Observe	End Sat Flow	Green Time	Seconds	No. Veh.	Sat Flow	
2:55:36	*2:55:51*	*00:15.0*	*15*	*9*	*2160*	
2:58:05	*2:58:34*	*00:29.0*	*29*	*18*	*2234*	
3:00:41	*3:01:10*	*00:29.0*	*29*	*14*	*1738*	5 of these vehicles were semis
3:03:03	*3:03:17*	*00:14.0*	*14*	*9*	*2314*	
3:05:28	*3:05:53*	*00:25.0*	*25*	*12*	*1728*	4 of these vehicles were semis/school bus
3:07:53	*3:08:14*	*00:21.0*	*21*	*10*	*1714*	2 of these vehicles were log trucks
3:10:33	*3:10:58*	*00:25.0*	*25*	*16*	*2304*	
				Average =	2028	
				2-lanes =	*4055*	
				Synchro Sat Flow Adjustment	**2305**	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	263	353	6	77	422	767	22	1008	66	337	434	547
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	2100	1900	2305	1900	1900	1900	1900
Total Lost time (s)	4.5	3.5		4.5	3.5	4.5	4.5	4.0	4.0	4.5	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3099	3342		3335	3282	1716	1467	4055	1482	3400	3252	1568
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3099	3342		3335	3282	1716	1467	4055	1482	3400	3252	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	289	388	7	85	464	843	24	1108	73	370	477	601
RTOR Reduction (vph)	0	1	0	0	0	15	0	0	51	0	0	257
Lane Group Flow (vph)	289	394	0	85	464	828	24	1108	22	370	477	344
Confl. Peds. (#/hr)			17	17								
Heavy Vehicles (%)	13%	7%	33%	5%	10%	4%	23%	8%	9%	3%	11%	3%
Bus Blockages (#/hr)	0	1	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4	5	1	6		5	2	
Permitted Phases						4			6			2
Actuated Green, G (s)	17.3	28.9		8.4	20.0	64.0	5.1	42.3	42.3	44.0	81.2	81.2
Effective Green, g (s)	18.3	30.9		9.4	22.0	66.0	6.1	45.3	45.3	45.0	84.2	84.2
Actuated g/C Ratio	0.12	0.21		0.06	0.15	0.45	0.04	0.31	0.31	0.31	0.57	0.57
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	386	702		213	491	770	61	1249	456	1040	1861	898
v/s Ratio Prot	c0.09	0.12		0.03	0.14	c0.33	0.02	c0.27		0.11	0.15	
v/s Ratio Perm						0.15			0.02			0.22
v/c Ratio	0.75	0.56		0.40	0.95	1.07	0.39	0.89	0.05	0.36	0.26	0.38
Uniform Delay, d1	62.2	52.0		66.1	62.0	40.5	68.7	48.5	35.8	39.8	15.8	17.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	0.7		0.7	27.1	54.4	2.4	8.4	0.1	0.1	0.1	0.5
Delay (s)	69.3	52.8		66.9	89.0	95.0	71.1	56.9	35.9	39.9	15.9	17.7
Level of Service	E	D		E	F	F	E	E	D	D	B	B
Approach Delay (s)		59.8			91.3			55.9			22.8	
Approach LOS		E			F			E			C	

Intersection Summary			
HCM Average Control Delay	56.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	147.1	Sum of lost time (s)	17.5
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

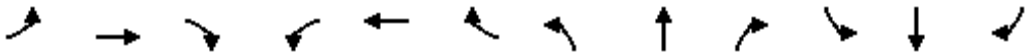
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	37	114	14	24	9	264	1002	54	35	373	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.4	3.0	3.0	4.4	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1515	1583	1520	1206	1770	3343	1521	1626	3252	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1719	1810	1515	1583	1520	1206	1770	3343	1521	1626	3252	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	89	39	120	15	25	9	278	1055	57	37	393	113
RTOR Reduction (vph)	0	0	82	0	0	8	0	0	7	0	0	56
Lane Group Flow (vph)	89	39	38	15	25	1	278	1055	50	37	393	57
Confl. Peds. (#/hr)	2		7	7		2						
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	6%	14%	25%	33%	2%	8%	4%	11%	11%	5%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	3	8	1	7	4	5	1	6		5	2	
Permitted Phases			8			4			6			2
Actuated Green, G (s)	11.3	10.8	36.4	5.3	4.8	10.1	25.6	79.2	79.2	5.3	58.9	58.9
Effective Green, g (s)	12.3	11.8	38.4	6.3	5.8	12.1	26.6	81.2	81.2	6.3	60.9	60.9
Actuated g/C Ratio	0.10	0.10	0.32	0.05	0.05	0.10	0.22	0.68	0.68	0.05	0.51	0.51
Clearance Time (s)	4.0	5.4	4.0	4.0	5.4	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.3	2.3	3.0	2.3	2.3	2.3	3.0	4.5	4.5	2.3	4.5	4.5
Lane Grp Cap (vph)	176	178	523	83	73	122	392	2262	1029	85	1650	781
v/s Ratio Prot	c0.05	0.02	0.02	0.01	c0.02	0.00	c0.16	c0.32		c0.02	0.12	
v/s Ratio Perm			0.01			0.00			0.03			0.04
v/c Ratio	0.51	0.22	0.07	0.18	0.34	0.01	0.71	0.47	0.05	0.44	0.24	0.07
Uniform Delay, d1	51.0	49.9	28.4	54.4	55.3	48.5	43.1	9.2	6.5	55.1	16.6	15.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.94	0.95	1.01	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.4	0.1	0.6	1.6	0.0	2.3	0.1	0.0	2.1	0.3	0.2
Delay (s)	52.3	50.2	28.5	55.0	56.9	48.6	42.7	8.8	6.6	57.2	16.9	15.3
Level of Service	D	D	C	D	E	D	D	A	A	E	B	B
Approach Delay (s)		40.4			54.8			15.5			19.3	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

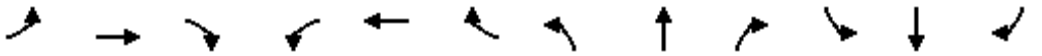
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	218	221	165	1105	408	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1719	1583	1719	1776	3252	1503
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1719	1583	1719	1776	3252	1503
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	251	254	190	1270	469	70
RTOR Reduction (vph)	0	211	0	0	0	29
Lane Group Flow (vph)	251	43	190	1270	469	41
Confl. Peds. (#/hr)	6	1	1			1
Heavy Vehicles (%)	5%	2%	5%	7%	11%	5%
Turn Type		Prot	Prot			Perm
Protected Phases	8	8	1	6	2	
Permitted Phases						2
Actuated Green, G (s)	19.1	19.1	17.9	90.4	68.5	68.5
Effective Green, g (s)	20.1	20.1	18.9	92.4	70.5	70.5
Actuated g/C Ratio	0.17	0.17	0.16	0.77	0.59	0.59
Clearance Time (s)	4.5	4.5	4.0	6.0	6.0	6.0
Vehicle Extension (s)	2.3	2.3	2.3	4.5	4.5	4.5
Lane Grp Cap (vph)	288	265	271	1368	1911	883
v/s Ratio Prot	c0.15	0.03	0.11	c0.72	0.14	
v/s Ratio Perm						0.03
v/c Ratio	0.87	0.16	0.70	0.93	0.25	0.05
Uniform Delay, d1	48.7	42.7	47.9	11.1	11.9	10.5
Progression Factor	1.00	1.00	1.00	1.00	0.97	1.20
Incremental Delay, d2	23.5	0.2	7.0	12.3	0.3	0.1
Delay (s)	72.2	42.9	54.9	23.5	11.9	12.7
Level of Service	E	D	D	C	B	B
Approach Delay (s)	57.4			27.6	12.0	
Approach LOS	E			C	B	

Intersection Summary			
HCM Average Control Delay	30.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	13	8	26	2	324	2	876	21	178	434	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5	3.5	3.0	5.0		3.0	5.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1731			1749	1548	1805	1733		1770	1709	
Flt Permitted		0.81			0.75	1.00	0.40	1.00		0.06	1.00	
Satd. Flow (perm)		1452			1379	1548	761	1733		103	1709	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	35	15	10	31	2	386	2	1043	25	212	517	27
RTOR Reduction (vph)	0	6	0	0	0	299	0	1	0	0	1	0
Lane Group Flow (vph)	0	54	0	0	33	87	2	1067	0	212	543	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	7%	0%	0%	4%	0%	2%	0%	9%	19%	2%	10%	17%
Turn Type	Perm			Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		11.3			11.3	11.3	71.0	71.0		97.2	95.2	
Effective Green, g (s)		12.3			12.3	12.3	72.0	72.0		98.2	96.2	
Actuated g/C Ratio		0.10			0.10	0.10	0.59	0.59		0.80	0.79	
Clearance Time (s)		4.5			4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.5			2.5	2.5	2.3	4.5		2.3	4.5	
Lane Grp Cap (vph)		146			139	156	466	1023		441	1348	
v/s Ratio Prot							0.00	c0.62		c0.10	0.32	
v/s Ratio Perm		0.04			0.02	c0.06	0.00			0.28		
v/c Ratio		0.37			0.24	0.56	0.00	1.04		0.48	0.40	
Uniform Delay, d1		51.2			50.5	52.3	10.6	25.0		36.1	4.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.1			0.6	3.7	0.0	40.1		0.5	0.9	
Delay (s)		52.4			51.2	56.0	10.6	65.1		36.6	4.9	
Level of Service		D			D	E	B	E		D	A	
Approach Delay (s)		52.4			55.6			65.0			13.8	
Approach LOS		D			E			E			B	

Intersection Summary			
HCM Average Control Delay	46.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	122.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	543	57	4	877	69	95	17	15	176	28	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1687	3383		1434	3344		1671	1708		1703	1900	1568
Flt Permitted	0.11	1.00		0.38	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	192	3383		574	3344		1671	1708		1703	1900	1568
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	149	646	68	5	1044	82	113	20	18	210	33	350
RTOR Reduction (vph)	0	4	0	0	3	0	0	15	0	0	0	122
Lane Group Flow (vph)	149	710	0	5	1123	0	113	23	0	210	33	228
Confl. Peds. (#/hr)	2		15	15		2						
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	7%	4%	9%	25%	6%	14%	8%	0%	7%	6%	0%	3%
Turn Type	pm+pt			pm+pt			Split			Split		pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases	2			6								4
Actuated Green, G (s)	78.7	73.3		59.0	58.1		18.6	18.6		21.4	21.4	37.5
Effective Green, g (s)	79.7	74.3		61.0	59.1		19.6	19.6		22.4	22.4	39.5
Actuated g/C Ratio	0.60	0.56		0.46	0.45		0.15	0.15		0.17	0.17	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	2.5	5.2		2.3	5.2		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	309	1901		277	1495		248	253		289	322	510
v/s Ratio Prot	c0.06	0.21		0.00	c0.34		c0.07	0.01		c0.12	0.02	c0.06
v/s Ratio Perm	0.23			0.01								0.09
v/c Ratio	0.48	0.37		0.02	0.75		0.46	0.09		0.73	0.10	0.45
Uniform Delay, d1	18.7	16.1		19.2	30.4		51.4	48.6		52.0	46.4	37.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	0.3		0.0	2.7		1.0	0.1		8.3	0.1	0.5
Delay (s)	19.6	16.3		19.3	33.1		52.4	48.7		60.3	46.5	38.0
Level of Service	B	B		B	C		D	D		E	D	D
Approach Delay (s)		16.9			33.0			51.5			46.3	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	31.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	132.2	Sum of lost time (s)	10.5
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	9	25	36	935	652	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1626	1553	1804	1792	1810	1568
Flt Permitted	0.95	1.00	0.23	1.00	1.00	1.00
Satd. Flow (perm)	1626	1553	443	1792	1810	1568
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	12	33	48	1247	869	95
RTOR Reduction (vph)	0	31	0	0	0	15
Lane Group Flow (vph)	12	2	48	1247	869	80
Confl. Peds. (#/hr)			7			7
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	11%	4%	0%	6%	5%	3%
Turn Type		Prot	pm+pt			pt+ov
Protected Phases	8	8	1	6	2	2 8
Permitted Phases			6			
Actuated Green, G (s)	4.9	4.9	71.2	71.2	62.5	71.9
Effective Green, g (s)	4.9	4.9	71.2	71.2	62.5	71.9
Actuated g/C Ratio	0.06	0.06	0.84	0.84	0.73	0.84
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	2.5	2.5	2.3	5.1	5.1	
Lane Grp Cap (vph)	94	89	438	1499	1329	1325
v/s Ratio Prot	c0.01	0.00	0.01	c0.70	0.48	0.05
v/s Ratio Perm			0.09			
v/c Ratio	0.13	0.02	0.11	0.83	0.65	0.06
Uniform Delay, d1	38.1	37.8	4.0	3.7	5.8	1.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.1	4.6	1.6	0.0
Delay (s)	38.5	37.9	4.1	8.3	7.4	1.1
Level of Service	D	D	A	A	A	A
Approach Delay (s)	38.1			8.2	6.8	
Approach LOS	D			A	A	

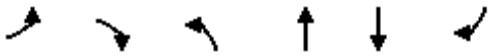
Intersection Summary			
HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	85.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	7	35	936	5	10	667
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	10	48	1282	7	14	914
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2227	1286			1289	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2227	1286			1289	
tC, single (s)	6.7	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.4			2.2	
p0 queue free %	75	75			97	
cM capacity (veh/h)	38	189			545	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	58	1289	927
Volume Left	10	0	14
Volume Right	48	7	0
cSH	114	1700	545
Volume to Capacity	0.50	0.76	0.03
Queue Length 95th (ft)	57	0	2
Control Delay (s)	64.8	0.0	0.8
Lane LOS	F		A
Approach Delay (s)	64.8	0.0	0.8
Approach LOS	F		

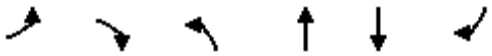
Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	301	32	106	640	181	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.5	4.8	4.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1641	1482	1805	1863	1694	
Flt Permitted	0.95	1.00	0.23	1.00	1.00	
Satd. Flow (perm)	1641	1482	435	1863	1694	
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	424	45	149	901	255	211
RTOR Reduction (vph)	0	29	0	0	30	0
Lane Group Flow (vph)	424	16	149	901	436	0
Confl. Peds. (#/hr)			2			2
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	10%	9%	0%	2%	6%	2%
Turn Type		Perm	pm+pt			
Protected Phases	8		1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)	25.2	25.2	38.0	38.0	25.3	
Effective Green, g (s)	25.2	25.2	38.0	38.0	25.3	
Actuated g/C Ratio	0.35	0.35	0.53	0.53	0.35	
Clearance Time (s)	4.0	4.0	4.5	4.8	4.8	
Vehicle Extension (s)	2.5	2.5	2.3	2.0	2.0	
Lane Grp Cap (vph)	574	519	386	983	595	
v/s Ratio Prot	c0.26		0.04	c0.48	0.26	
v/s Ratio Perm		0.01	0.16			
v/c Ratio	0.74	0.03	0.39	0.92	0.73	
Uniform Delay, d1	20.5	15.4	10.9	15.6	20.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.7	0.0	0.4	12.6	4.0	
Delay (s)	25.2	15.4	11.2	28.2	24.4	
Level of Service	C	B	B	C	C	
Approach Delay (s)	24.2			25.8	24.4	
Approach LOS	C			C	C	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

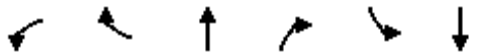
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	82	41	51	662	176	39
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	100	50	62	807	215	48
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1170	238	262			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1170	238	262			
tC, single (s)	6.4	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.3			
p0 queue free %	51	94	95			
cM capacity (veh/h)	203	781	1257			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	150	62	807	262
Volume Left	100	62	0	0
Volume Right	50	0	0	48
cSH	304	1257	1700	1700
Volume to Capacity	0.49	0.05	0.47	0.15
Queue Length 95th (ft)	64	4	0	0
Control Delay (s)	29.3	8.0	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	29.3	0.6		0.0
Approach LOS	D			

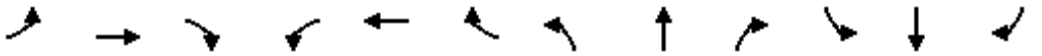
Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	81	13	182	28	4	416
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	99	16	222	34	5	507
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)			394			
pX, platoon unblocked	0.97	0.97			0.97	
vC, conflicting volume	756	240			256	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	730	196			213	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	74	98			100	
cM capacity (veh/h)	376	801			1323	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	115	256	5	507
Volume Left	99	0	5	0
Volume Right	16	34	0	0
cSH	437	1700	1323	1700
Volume to Capacity	0.26	0.15	0.00	0.30
Queue Length 95th (ft)	26	0	0	0
Control Delay (s)	16.8	0.0	7.7	0.0
Lane LOS	C		A	
Approach Delay (s)	16.8	0.0	0.1	
Approach LOS	C			

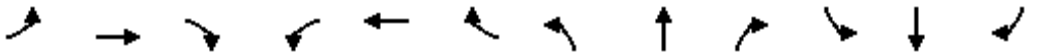
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	557	745	77	148	429	397	29	584	164	781	1078	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	3.5		4.5	3.5	4.5	4.5	4.0	4.0	4.5	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3510		3502	3574	1559	1752	3406	1549	3467	3505	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3510		3502	3574	1559	1752	3406	1549	3467	3505	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	574	768	79	153	442	409	30	602	169	805	1111	604
RTOR Reduction (vph)	0	4	0	0	0	24	0	0	124	0	0	306
Lane Group Flow (vph)	574	843	0	153	442	385	30	602	45	805	1111	298
Confl. Peds. (#/hr)	2		11	11		2			8	8		
Heavy Vehicles (%)	1%	1%	1%	0%	1%	3%	3%	6%	2%	1%	3%	1%
Bus Blockages (#/hr)	0	1	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4	5	1	6		5	2	
Permitted Phases						4			6			2
Actuated Green, G (s)	20.7	34.1		10.8	24.2	60.1	4.7	34.2	34.2	35.9	65.4	65.4
Effective Green, g (s)	21.7	36.1		11.8	26.2	62.1	5.7	37.2	37.2	36.9	68.4	68.4
Actuated g/C Ratio	0.16	0.26		0.09	0.19	0.45	0.04	0.27	0.27	0.27	0.49	0.49
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	543	915		298	676	699	72	915	416	924	1731	790
v/s Ratio Prot	0.17	c0.24		0.04	c0.12	0.15	0.02	0.18		c0.23	c0.32	
v/s Ratio Perm						0.10			0.03			0.19
v/c Ratio	1.06	0.92		0.51	0.65	0.55	0.42	0.66	0.11	0.87	0.64	0.38
Uniform Delay, d1	58.4	49.8		60.6	52.0	28.0	64.8	45.0	38.2	48.5	26.0	21.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	54.6	14.2		0.9	1.9	0.7	2.3	2.2	0.2	8.9	1.1	0.6
Delay (s)	113.0	64.0		61.5	53.9	28.6	67.0	47.2	38.4	57.4	27.0	22.4
Level of Service	F	E		E	D	C	E	D	D	E	C	C
Approach Delay (s)		83.8			44.8			46.1			35.6	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM Average Control Delay	50.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	138.5	Sum of lost time (s)	11.5
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



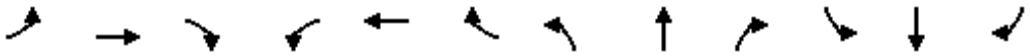
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	129	24	503	46	42	56	284	592	28	25	1072	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.4	3.0	3.0	4.4	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1624	1594	1736	1863	1443	1787	3438	1423	1736	3539	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1624	1594	1736	1863	1443	1787	3438	1423	1736	3539	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	134	25	524	48	44	58	296	617	29	26	1117	215
RTOR Reduction (vph)	0	0	67	0	0	51	0	0	8	0	0	114
Lane Group Flow (vph)	134	25	457	48	44	7	296	617	21	26	1117	101
Confl. Peds. (#/hr)	2		2	2		2			1	1		
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	2%	17%	1%	4%	2%	11%	1%	5%	11%	4%	2%	0%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	3	8	1	7	4	5	1	6		5	2	
Permitted Phases			8			4			6			2
Actuated Green, G (s)	15.6	8.0	36.9	14.4	6.8	12.6	28.9	82.4	82.4	5.8	59.3	59.3
Effective Green, g (s)	16.6	9.0	38.9	15.4	7.8	14.6	29.9	84.4	84.4	6.8	61.3	61.3
Actuated g/C Ratio	0.13	0.07	0.30	0.12	0.06	0.11	0.23	0.65	0.65	0.05	0.47	0.47
Clearance Time (s)	4.0	5.4	4.0	4.0	5.4	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.3	2.3	3.0	2.3	2.3	2.3	3.0	4.5	4.5	2.3	4.5	4.5
Lane Grp Cap (vph)	226	112	514	206	112	162	411	2232	924	91	1669	762
v/s Ratio Prot	c0.08	0.02	c0.20	0.03	0.02	0.00	0.17	0.18		0.01	c0.32	
v/s Ratio Perm			0.08			0.00			0.01			0.06
v/c Ratio	0.59	0.22	0.89	0.23	0.39	0.04	0.72	0.28	0.02	0.29	0.67	0.13
Uniform Delay, d1	53.5	57.2	43.5	51.9	58.8	51.5	46.2	9.7	8.1	59.3	26.5	19.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.05	0.87	0.76	1.00	1.00	1.00
Incremental Delay, d2	3.2	0.6	16.9	0.3	1.3	0.1	5.4	0.1	0.0	1.0	2.2	0.4
Delay (s)	56.7	57.8	60.4	52.3	60.1	51.5	53.8	8.6	6.2	60.3	28.7	19.7
Level of Service	E	E	E	D	E	D	D	A	A	E	C	B
Approach Delay (s)		59.5			54.3			22.7			27.9	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM Average Control Delay	34.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

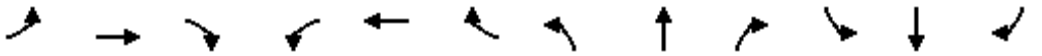
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	191	288	187	681	1211	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1568	1770	1827	3471	1577
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1568	1770	1827	3471	1577
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	199	300	195	709	1261	254
RTOR Reduction (vph)	0	254	0	0	0	86
Lane Group Flow (vph)	199	46	195	709	1261	168
Confl. Peds. (#/hr)	4	1	1			1
Heavy Vehicles (%)	2%	3%	2%	4%	4%	0%
Turn Type		Prot	Prot			Perm
Protected Phases	8	8	1	6	2	
Permitted Phases						2
Actuated Green, G (s)	18.8	18.8	18.9	100.7	77.8	77.8
Effective Green, g (s)	19.8	19.8	19.9	102.7	79.8	79.8
Actuated g/C Ratio	0.15	0.15	0.15	0.79	0.61	0.61
Clearance Time (s)	4.5	4.5	4.0	6.0	6.0	6.0
Vehicle Extension (s)	2.3	2.3	2.3	4.5	4.5	4.5
Lane Grp Cap (vph)	270	239	271	1443	2131	968
v/s Ratio Prot	c0.11	0.03	c0.11	0.39	c0.36	
v/s Ratio Perm						0.11
v/c Ratio	0.74	0.19	0.72	0.49	0.59	0.17
Uniform Delay, d1	52.6	48.1	52.4	4.7	15.2	10.9
Progression Factor	1.00	1.00	1.00	1.00	0.77	0.23
Incremental Delay, d2	9.2	0.2	7.9	1.2	0.8	0.3
Delay (s)	61.8	48.3	60.3	5.9	12.6	2.7
Level of Service	E	D	E	A	B	A
Approach Delay (s)	53.7			17.6	11.0	
Approach LOS	D			B	B	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	4	2	25	5	211	1	623	23	254	1200	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5	3.5	3.0	5.0		3.0	5.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.96			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1762			1608	1563	1805	1799		1805	1818	
Flt Permitted		0.74			0.80	1.00	0.07	1.00		0.32	1.00	
Satd. Flow (perm)		1355			1337	1563	124	1799		607	1818	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	32	4	2	26	5	220	1	649	24	265	1250	47
RTOR Reduction (vph)	0	2	0	0	0	203	0	1	0	0	1	0
Lane Group Flow (vph)	0	36	0	0	31	17	1	672	0	265	1296	0
Confl. Peds. (#/hr)	1					1			1	1		
Heavy Vehicles (%)	3%	0%	0%	16%	0%	1%	0%	5%	4%	0%	4%	2%
Turn Type	Perm			Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		9.0			9.0	9.0	83.3	83.3		109.5	107.5	
Effective Green, g (s)		10.0			10.0	10.0	84.3	84.3		110.5	108.5	
Actuated g/C Ratio		0.08			0.08	0.08	0.64	0.64		0.84	0.82	
Clearance Time (s)		4.5			4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.5			2.5	2.5	2.3	4.5		2.3	4.5	
Lane Grp Cap (vph)		103			101	118	105	1149		746	1494	
v/s Ratio Prot							0.00	c0.37		0.07	c0.71	
v/s Ratio Perm		c0.03			0.02	0.01	0.01			0.23		
v/c Ratio		0.35			0.31	0.14	0.01	0.59		0.36	0.87	
Uniform Delay, d1		57.9			57.7	57.0	21.7	13.8		9.2	7.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.5			1.3	0.4	0.0	2.2		0.2	7.1	
Delay (s)		59.4			59.0	57.4	21.7	15.9		9.4	14.4	
Level of Service		E			E	E	C	B		A	B	
Approach Delay (s)		59.4			57.6			16.0			13.5	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	438	940	106	23	467	75	205	94	44	66	53	302
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1786	3481		1804	3448		1787	1799		1719	1900	1578
Flt Permitted	0.23	1.00		0.25	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	439	3481		475	3448		1787	1799		1719	1900	1578
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	476	1022	115	25	508	82	223	102	48	72	58	328
RTOR Reduction (vph)	0	4	0	0	8	0	0	10	0	0	0	103
Lane Group Flow (vph)	476	1133	0	25	582	0	223	140	0	72	58	225
Confl. Peds. (#/hr)	3		4	4		3			4	4		
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	2%	0%	0%	2%	3%	1%	0%	0%	5%	0%	2%
Turn Type	pm+pt			pm+pt			Split			Split		pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases	2			6								4
Actuated Green, G (s)	65.5	57.8		33.7	30.5		19.1	19.1		10.0	10.0	40.5
Effective Green, g (s)	66.5	58.8		35.7	31.5		20.1	20.1		11.0	11.0	42.5
Actuated g/C Ratio	0.62	0.54		0.33	0.29		0.19	0.19		0.10	0.10	0.39
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	2.5	5.2		2.3	5.2		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	663	1893		209	1005		332	335		175	193	671
v/s Ratio Prot	c0.21	0.33		0.00	0.17		c0.12	0.08		c0.04	0.03	0.10
v/s Ratio Perm	c0.23			0.03								0.05
v/c Ratio	0.72	0.60		0.12	0.58		0.67	0.42		0.41	0.30	0.34
Uniform Delay, d1	15.2	16.7		24.6	32.7		40.9	38.8		45.5	45.0	22.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.5	0.8		0.1	1.4		4.8	0.6		1.1	0.6	0.2
Delay (s)	18.7	17.5		24.7	34.0		45.7	39.5		46.7	45.6	23.2
Level of Service	B	B		C	C		D	D		D	D	C
Approach Delay (s)		17.8			33.6			43.2			29.7	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	108.1	Sum of lost time (s)	10.5
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

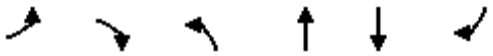
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	59	40	25	462	1008	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1805	1615	1805	1863	1881	1615
Flt Permitted	0.95	1.00	0.09	1.00	1.00	1.00
Satd. Flow (perm)	1805	1615	166	1863	1881	1615
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	66	45	28	519	1133	48
RTOR Reduction (vph)	0	40	0	0	0	6
Lane Group Flow (vph)	66	5	28	519	1133	42
Confl. Peds. (#/hr)			7			7
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%
Turn Type		Prot	pm+pt			pt+ov
Protected Phases	8	8	1	6	2	2 8
Permitted Phases			6			
Actuated Green, G (s)	9.0	9.0	64.4	64.4	57.8	71.3
Effective Green, g (s)	9.0	9.0	64.4	64.4	57.8	71.3
Actuated g/C Ratio	0.11	0.11	0.78	0.78	0.70	0.87
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	2.5	2.5	2.3	5.1	5.1	
Lane Grp Cap (vph)	197	176	172	1456	1319	1397
v/s Ratio Prot	c0.04	0.00	0.00	c0.28	c0.60	0.03
v/s Ratio Perm			0.12			
v/c Ratio	0.34	0.03	0.16	0.36	0.86	0.03
Uniform Delay, d1	33.9	32.8	13.2	2.7	9.2	0.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0	0.3	0.3	6.4	0.0
Delay (s)	34.7	32.8	13.5	3.1	15.6	0.8
Level of Service	C	C	B	A	B	A
Approach Delay (s)	33.9			3.6	15.0	
Approach LOS	C			A	B	

Intersection Summary			
HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	82.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	18	469	6	37	1011
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	5	20	533	7	42	1149
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1769	536			540	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1769	536			540	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	95	96			96	
cM capacity (veh/h)	89	537			1024	

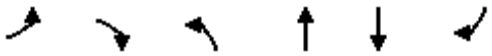
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	540	1191
Volume Left	5	0	42
Volume Right	20	7	0
cSH	280	1700	1024
Volume to Capacity	0.09	0.32	0.04
Queue Length 95th (ft)	7	0	3
Control Delay (s)	19.1	0.0	1.4
Lane LOS	C		A
Approach Delay (s)	19.1	0.0	1.4
Approach LOS	C		

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		93.1%	ICU Level of Service F
Analysis Period (min)		15	



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	110	10	11	365	865	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.5	4.8	4.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1615	1805	1827	1833	
Flt Permitted	0.95	1.00	0.10	1.00	1.00	
Satd. Flow (perm)	1805	1615	183	1827	1833	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	11	12	406	961	127
RTOR Reduction (vph)	0	10	0	0	2	0
Lane Group Flow (vph)	122	1	12	406	1086	0
Confl. Peds. (#/hr)			3			3
Heavy Vehicles (%)	0%	0%	0%	4%	2%	0%
Turn Type		Perm	pm+pt			
Protected Phases	8		1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)	9.6	9.6	56.5	56.5	51.0	
Effective Green, g (s)	9.6	9.6	56.5	56.5	51.0	
Actuated g/C Ratio	0.13	0.13	0.75	0.75	0.68	
Clearance Time (s)	4.0	4.0	4.5	4.8	4.8	
Vehicle Extension (s)	2.5	2.5	2.3	2.0	2.0	
Lane Grp Cap (vph)	231	207	160	1378	1248	
v/s Ratio Prot	c0.07		0.00	c0.22	c0.59	
v/s Ratio Perm		0.00	0.06			
v/c Ratio	0.53	0.01	0.07	0.29	0.87	
Uniform Delay, d1	30.5	28.5	11.2	2.9	9.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	0.0	0.1	0.0	6.7	
Delay (s)	32.2	28.5	11.4	2.9	16.0	
Level of Service	C	C	B	A	B	
Approach Delay (s)	31.9			3.2	16.0	
Approach LOS	C			A	B	

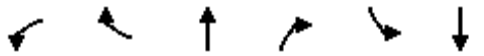
Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	74.9	Sum of lost time (s)	13.6
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	64	18	19	310	715	155
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	67	19	20	326	753	163
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1201	834	916			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1201	834	916			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	95	97			
cM capacity (veh/h)	199	371	753			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	86	20	326	916
Volume Left	67	20	0	0
Volume Right	19	0	0	163
cSH	255	753	1700	1700
Volume to Capacity	0.34	0.03	0.19	0.54
Queue Length 95th (ft)	36	2	0	0
Control Delay (s)	28.4	9.9	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	28.4	0.6		0.0
Approach LOS	D			

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		



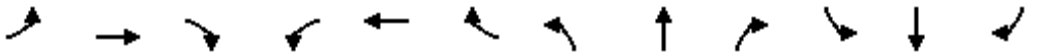
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	62	5	502	102	10	359
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	70	6	570	116	11	408
Pedestrians	2		2			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	0		0			
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)			394			
pX, platoon unblocked	0.79	0.79			0.79	
vC, conflicting volume	1063	630			688	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	950	406			479	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	99			99	
cM capacity (veh/h)	227	515			868	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	76	686	11	408
Volume Left	70	0	11	0
Volume Right	6	116	0	0
cSH	246	1700	868	1700
Volume to Capacity	0.31	0.40	0.01	0.24
Queue Length 95th (ft)	32	0	1	0
Control Delay (s)	26.6	0.0	9.2	0.0
Lane LOS	D		A	
Approach Delay (s)	26.6	0.0	0.2	
Approach LOS	D			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

Attachment D

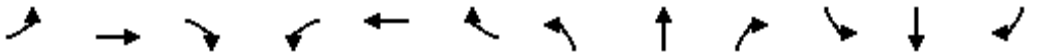
Year 2016 Background Traffic
Level-of-Service Worksheets



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	271	364	6	79	435	790	23	1038	68	347	447	563
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	2100	1900	2305	1900	1900	1900	1900
Total Lost time (s)	4.5	3.5		4.5	3.5	4.5	4.5	4.0	4.0	4.5	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3099	3343		3335	3282	1716	1467	4055	1482	3400	3252	1568
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3099	3343		3335	3282	1716	1467	4055	1482	3400	3252	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	298	400	7	87	478	868	25	1141	75	381	491	619
RTOR Reduction (vph)	0	1	0	0	0	14	0	0	52	0	0	266
Lane Group Flow (vph)	298	406	0	87	478	854	25	1141	23	381	491	353
Confl. Peds. (#/hr)			17	17								
Heavy Vehicles (%)	13%	7%	33%	5%	10%	4%	23%	8%	9%	3%	11%	3%
Bus Blockages (#/hr)	0	1	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4	5	1	6		5	2	
Permitted Phases						4			6			2
Actuated Green, G (s)	17.6	29.1		8.5	20.0	64.0	5.1	42.2	42.2	44.0	81.1	81.1
Effective Green, g (s)	18.6	31.1		9.5	22.0	66.0	6.1	45.2	45.2	45.0	84.1	84.1
Actuated g/C Ratio	0.13	0.21		0.06	0.15	0.45	0.04	0.31	0.31	0.31	0.57	0.57
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	391	706		215	490	769	61	1244	455	1039	1857	895
v/s Ratio Prot	c0.10	0.12		0.03	0.15	c0.34	0.02	c0.28		0.11	0.15	
v/s Ratio Perm						0.16			0.02			0.23
v/c Ratio	0.76	0.58		0.40	0.98	1.11	0.41	0.92	0.05	0.37	0.26	0.39
Uniform Delay, d1	62.2	52.2		66.2	62.4	40.7	68.8	49.2	35.9	40.0	16.0	17.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.0	0.8		0.7	34.0	67.3	2.6	11.1	0.1	0.1	0.1	0.5
Delay (s)	70.2	53.0		66.9	96.4	107.9	71.4	60.3	36.0	40.1	16.1	18.0
Level of Service	E	D		E	F	F	E	E	D	D	B	B
Approach Delay (s)		60.3			101.6			59.1			23.1	
Approach LOS		E			F			E			C	

Intersection Summary			
HCM Average Control Delay	60.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	147.3	Sum of lost time (s)	17.5
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	37	114	14	24	9	264	1032	54	35	384	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.4	3.0	3.0	4.4	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1515	1583	1520	1206	1770	3343	1521	1626	3252	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1719	1810	1515	1583	1520	1206	1770	3343	1521	1626	3252	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	89	39	120	15	25	9	278	1086	57	37	404	113
RTOR Reduction (vph)	0	0	82	0	0	8	0	0	7	0	0	56
Lane Group Flow (vph)	89	39	38	15	25	1	278	1086	50	37	404	57
Confl. Peds. (#/hr)	2		7	7		2						
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	6%	14%	25%	33%	2%	8%	4%	11%	11%	5%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	3	8	1	7	4	5	1	6		5	2	
Permitted Phases			8			4			6			2
Actuated Green, G (s)	11.3	10.8	36.4	5.3	4.8	10.1	25.6	79.2	79.2	5.3	58.9	58.9
Effective Green, g (s)	12.3	11.8	38.4	6.3	5.8	12.1	26.6	81.2	81.2	6.3	60.9	60.9
Actuated g/C Ratio	0.10	0.10	0.32	0.05	0.05	0.10	0.22	0.68	0.68	0.05	0.51	0.51
Clearance Time (s)	4.0	5.4	4.0	4.0	5.4	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.3	2.3	3.0	2.3	2.3	2.3	3.0	4.5	4.5	2.3	4.5	4.5
Lane Grp Cap (vph)	176	178	523	83	73	122	392	2262	1029	85	1650	781
v/s Ratio Prot	c0.05	0.02	0.02	0.01	c0.02	0.00	c0.16	c0.32		c0.02	0.12	
v/s Ratio Perm			0.01			0.00			0.03			0.04
v/c Ratio	0.51	0.22	0.07	0.18	0.34	0.01	0.71	0.48	0.05	0.44	0.24	0.07
Uniform Delay, d1	51.0	49.9	28.4	54.4	55.3	48.5	43.1	9.3	6.5	55.1	16.6	15.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.96	1.03	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.4	0.1	0.6	1.6	0.0	2.1	0.1	0.0	2.1	0.4	0.2
Delay (s)	52.3	50.2	28.5	55.0	56.9	48.6	42.8	9.1	6.7	57.2	17.0	15.3
Level of Service	D	D	C	D	E	D	D	A	A	E	B	B
Approach Delay (s)		40.4			54.8			15.6			19.3	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

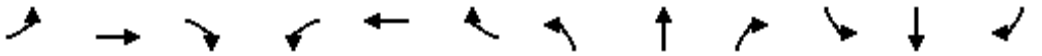
c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	218	221	165	1139	421	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1719	1583	1719	1776	3252	1503
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1719	1583	1719	1776	3252	1503
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	251	254	190	1309	484	70
RTOR Reduction (vph)	0	211	0	0	0	29
Lane Group Flow (vph)	251	43	190	1309	484	41
Confl. Peds. (#/hr)	6	1	1			1
Heavy Vehicles (%)	5%	2%	5%	7%	11%	5%
Turn Type		Prot	Prot			Perm
Protected Phases	8	8	1	6	2	
Permitted Phases						2
Actuated Green, G (s)	19.1	19.1	17.9	90.4	68.5	68.5
Effective Green, g (s)	20.1	20.1	18.9	92.4	70.5	70.5
Actuated g/C Ratio	0.17	0.17	0.16	0.77	0.59	0.59
Clearance Time (s)	4.5	4.5	4.0	6.0	6.0	6.0
Vehicle Extension (s)	2.3	2.3	2.3	4.5	4.5	4.5
Lane Grp Cap (vph)	288	265	271	1368	1911	883
v/s Ratio Prot	c0.15	0.03	0.11	c0.74	0.15	
v/s Ratio Perm						0.03
v/c Ratio	0.87	0.16	0.70	0.96	0.25	0.05
Uniform Delay, d1	48.7	42.7	47.9	12.1	12.0	10.5
Progression Factor	1.00	1.00	1.00	1.00	0.97	1.18
Incremental Delay, d2	23.5	0.2	7.0	16.0	0.3	0.1
Delay (s)	72.2	42.9	54.9	28.1	11.9	12.5
Level of Service	E	D	D	C	B	B
Approach Delay (s)	57.4			31.5	12.0	
Approach LOS	E			C	B	

Intersection Summary			
HCM Average Control Delay	32.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	13	8	26	2	324	2	902	21	178	447	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5	3.5	3.0	5.0		3.0	5.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1731			1749	1548	1805	1734		1770	1710	
Flt Permitted		0.82			0.75	1.00	0.39	1.00		0.06	1.00	
Satd. Flow (perm)		1453			1382	1548	744	1734		104	1710	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	35	15	10	31	2	386	2	1074	25	212	532	27
RTOR Reduction (vph)	0	6	0	0	0	293	0	1	0	0	1	0
Lane Group Flow (vph)	0	54	0	0	33	93	2	1098	0	212	558	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	7%	0%	0%	4%	0%	2%	0%	9%	19%	2%	10%	17%
Turn Type	Perm			Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		11.4			11.4	11.4	70.9	70.9		97.1	95.1	
Effective Green, g (s)		12.4			12.4	12.4	71.9	71.9		98.1	96.1	
Actuated g/C Ratio		0.10			0.10	0.10	0.59	0.59		0.80	0.79	
Clearance Time (s)		4.5			4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.5			2.5	2.5	2.3	4.5		2.3	4.5	
Lane Grp Cap (vph)		148			140	157	456	1022		441	1347	
v/s Ratio Prot							0.00	c0.63		c0.10	0.33	
v/s Ratio Perm		0.04			0.02	c0.06	0.00			0.28		
v/c Ratio		0.36			0.24	0.59	0.00	1.07		0.48	0.41	
Uniform Delay, d1		51.1			50.4	52.4	10.7	25.0		37.7	4.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.1			0.6	4.9	0.0	50.4		0.5	0.9	
Delay (s)		52.2			51.1	57.3	10.7	75.5		38.2	5.0	
Level of Service		D			D	E	B	E		D	A	
Approach Delay (s)		52.2			56.8			75.4			14.1	
Approach LOS		D			E			E			B	

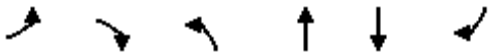
Intersection Summary			
HCM Average Control Delay	51.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	122.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	559	57	4	903	69	95	17	15	176	28	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1687	3385		1435	3345		1671	1708		1703	1900	1568
Flt Permitted	0.10	1.00		0.37	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	185	3385		564	3345		1671	1708		1703	1900	1568
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	149	665	68	5	1075	82	113	20	18	210	33	350
RTOR Reduction (vph)	0	3	0	0	3	0	0	15	0	0	0	121
Lane Group Flow (vph)	149	730	0	5	1154	0	113	23	0	210	33	229
Confl. Peds. (#/hr)	2		15	15		2						
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	7%	4%	9%	25%	6%	14%	8%	0%	7%	6%	0%	3%
Turn Type	pm+pt			pm+pt			Split			Split		pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases	2			6								4
Actuated Green, G (s)	81.0	75.6		61.3	60.4		18.6	18.6		21.4	21.4	37.5
Effective Green, g (s)	82.0	76.6		63.3	61.4		19.6	19.6		22.4	22.4	39.5
Actuated g/C Ratio	0.61	0.57		0.47	0.46		0.15	0.15		0.17	0.17	0.29
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	2.5	5.2		2.3	5.2		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	304	1928		278	1527		244	249		284	316	501
v/s Ratio Prot	c0.06	0.22		0.00	c0.35		c0.07	0.01		c0.12	0.02	c0.06
v/s Ratio Perm	0.24			0.01								0.09
v/c Ratio	0.49	0.38		0.02	0.76		0.46	0.09		0.74	0.10	0.46
Uniform Delay, d1	19.1	15.9		18.9	30.3		52.6	49.7		53.3	47.5	38.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	0.3		0.0	2.7		1.0	0.1		9.1	0.1	0.5
Delay (s)	20.0	16.2		18.9	33.0		53.6	49.9		62.4	47.6	39.2
Level of Service	C	B		B	C		D	D		E	D	D
Approach Delay (s)		16.8			32.9			52.7			47.9	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	32.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	134.5	Sum of lost time (s)	10.5
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	9	25	36	963	672	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1626	1553	1805	1792	1810	1568
Flt Permitted	0.95	1.00	0.22	1.00	1.00	1.00
Satd. Flow (perm)	1626	1553	421	1792	1810	1568
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	12	33	48	1284	896	95
RTOR Reduction (vph)	0	31	0	0	0	15
Lane Group Flow (vph)	12	2	48	1284	896	80
Confl. Peds. (#/hr)			7			7
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	11%	4%	0%	6%	5%	3%
Turn Type		Prot	pm+pt			pt+ov
Protected Phases	8	8	1	6	2	2 8
Permitted Phases			6			
Actuated Green, G (s)	4.9	4.9	71.4	71.4	62.7	72.1
Effective Green, g (s)	4.9	4.9	71.4	71.4	62.7	72.1
Actuated g/C Ratio	0.06	0.06	0.84	0.84	0.74	0.85
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	2.5	2.5	2.3	5.1	5.1	
Lane Grp Cap (vph)	93	89	421	1500	1330	1325
v/s Ratio Prot	c0.01	0.00	0.01	c0.72	0.50	0.05
v/s Ratio Perm			0.09			
v/c Ratio	0.13	0.02	0.11	0.86	0.67	0.06
Uniform Delay, d1	38.2	37.9	4.3	4.0	5.9	1.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1	0.1	5.5	1.8	0.0
Delay (s)	38.6	38.0	4.4	9.5	7.7	1.1
Level of Service	D	D	A	A	A	A
Approach Delay (s)	38.2			9.4	7.1	
Approach LOS	D			A	A	

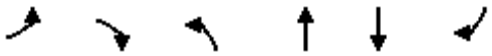
Intersection Summary			
HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	85.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	7	35	964	5	10	687
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	10	48	1321	7	14	941
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2292	1324			1327	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2292	1324			1327	
tC, single (s)	6.7	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.4			2.2	
p0 queue free %	72	73			97	
cM capacity (veh/h)	35	180			527	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	58	1327	955
Volume Left	10	0	14
Volume Right	48	7	0
cSH	106	1700	527
Volume to Capacity	0.54	0.78	0.03
Queue Length 95th (ft)	63	0	2
Control Delay (s)	73.6	0.0	0.9
Lane LOS	F		A
Approach Delay (s)	73.6	0.0	0.9
Approach LOS	F		

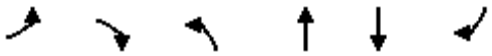
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	301	32	106	659	186	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.5	4.8	4.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1641	1482	1805	1863	1695	
Flt Permitted	0.95	1.00	0.23	1.00	1.00	
Satd. Flow (perm)	1641	1482	436	1863	1695	
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	424	45	149	928	262	211
RTOR Reduction (vph)	0	29	0	0	29	0
Lane Group Flow (vph)	424	16	149	928	444	0
Confl. Peds. (#/hr)			2			2
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	10%	9%	0%	2%	6%	2%
Turn Type		Perm	pm+pt			
Protected Phases	8		1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)	25.3	25.3	38.9	38.9	26.2	
Effective Green, g (s)	25.3	25.3	38.9	38.9	26.2	
Actuated g/C Ratio	0.35	0.35	0.53	0.53	0.36	
Clearance Time (s)	4.0	4.0	4.5	4.8	4.8	
Vehicle Extension (s)	2.5	2.5	2.3	2.0	2.0	
Lane Grp Cap (vph)	569	514	386	993	608	
v/s Ratio Prot	c0.26		0.04	c0.50	0.26	
v/s Ratio Perm		0.01	0.16			
v/c Ratio	0.75	0.03	0.39	0.93	0.73	
Uniform Delay, d1	21.0	15.7	10.9	15.9	20.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.0	0.0	0.4	15.0	3.7	
Delay (s)	26.0	15.8	11.2	30.9	24.0	
Level of Service	C	B	B	C	C	
Approach Delay (s)	25.0			28.1	24.0	
Approach LOS	C			C	C	

Intersection Summary			
HCM Average Control Delay	26.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	73.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	82	41	51	682	181	39
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	100	50	62	832	221	48
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1201	245	268			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1201	245	268			
tC, single (s)	6.4	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.3			
p0 queue free %	48	94	95			
cM capacity (veh/h)	194	775	1250			

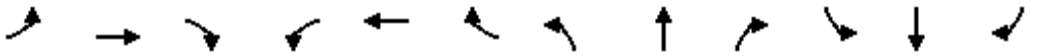
Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	150	62	832	268
Volume Left	100	62	0	0
Volume Right	50	0	0	48
cSH	291	1250	1700	1700
Volume to Capacity	0.52	0.05	0.49	0.16
Queue Length 95th (ft)	69	4	0	0
Control Delay (s)	31.1	8.0	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	31.1	0.6		0.0
Approach LOS	D			

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	81	13	182	28	4	416
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	99	16	222	34	5	507
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)			394			
pX, platoon unblocked	0.97	0.97			0.97	
vC, conflicting volume	756	240			256	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	731	197			213	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	74	98			100	
cM capacity (veh/h)	376	801			1323	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	115	256	5	507
Volume Left	99	0	5	0
Volume Right	16	34	0	0
cSH	437	1700	1323	1700
Volume to Capacity	0.26	0.15	0.00	0.30
Queue Length 95th (ft)	26	0	0	0
Control Delay (s)	16.8	0.0	7.7	0.0
Lane LOS	C		A	
Approach Delay (s)	16.8	0.0	0.1	
Approach LOS	C			

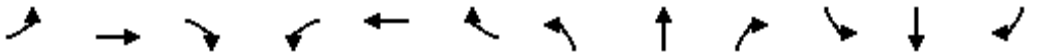
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	574	767	79	152	442	409	30	601	169	804	1111	604
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	3.5		4.5	3.5	4.5	4.5	4.0	4.0	4.5	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3510		3502	3574	1559	1752	3406	1549	3467	3505	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3510		3502	3574	1559	1752	3406	1549	3467	3505	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	592	791	81	157	456	422	31	620	174	829	1145	623
RTOR Reduction (vph)	0	4	0	0	0	22	0	0	127	0	0	312
Lane Group Flow (vph)	592	868	0	157	456	400	31	620	47	829	1145	311
Confl. Peds. (#/hr)	2		11	11		2			8	8		
Heavy Vehicles (%)	1%	1%	1%	0%	1%	3%	3%	6%	2%	1%	3%	1%
Bus Blockages (#/hr)	0	1	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4	5	1	6		5	2	
Permitted Phases						4			6			2
Actuated Green, G (s)	20.5	34.2		11.0	24.7	61.7	4.8	35.1	35.1	37.0	67.3	67.3
Effective Green, g (s)	21.5	36.2		12.0	26.7	63.7	5.8	38.1	38.1	38.0	70.3	70.3
Actuated g/C Ratio	0.15	0.26		0.09	0.19	0.45	0.04	0.27	0.27	0.27	0.50	0.50
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	529	902		298	678	705	72	922	419	936	1750	798
v/s Ratio Prot	c0.17	c0.25		0.04	c0.13	0.15	0.02	0.18		c0.24	c0.33	
v/s Ratio Perm						0.10			0.03			0.19
v/c Ratio	1.12	0.96		0.53	0.67	0.57	0.43	0.67	0.11	0.89	0.65	0.39
Uniform Delay, d1	59.7	51.6		61.7	53.0	28.4	65.9	45.8	38.6	49.3	26.2	21.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	76.1	21.1		1.1	2.3	0.8	2.4	2.4	0.2	9.9	1.1	0.6
Delay (s)	135.8	72.7		62.8	55.3	29.2	68.3	48.2	38.9	59.3	27.3	22.5
Level of Service	F	E		E	E	C	E	D	D	E	C	C
Approach Delay (s)		98.2			45.8			47.0			36.4	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM Average Control Delay	54.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



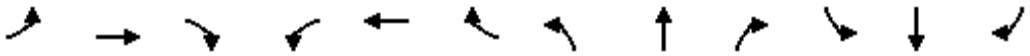
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	129	24	503	46	42	56	284	610	28	25	1104	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.4	3.0	3.0	4.4	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1624	1594	1736	1863	1443	1787	3438	1423	1736	3539	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1624	1594	1736	1863	1443	1787	3438	1423	1736	3539	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	134	25	524	48	44	58	296	635	29	26	1150	215
RTOR Reduction (vph)	0	0	64	0	0	51	0	0	8	0	0	114
Lane Group Flow (vph)	134	25	460	48	44	7	296	635	21	26	1150	101
Confl. Peds. (#/hr)	2		2	2		2			1	1		
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	2%	17%	1%	4%	2%	11%	1%	5%	11%	4%	2%	0%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	3	8	1	7	4	5	1	6		5	2	
Permitted Phases			8			4			6			2
Actuated Green, G (s)	15.6	8.0	37.0	14.4	6.8	12.6	29.0	82.4	82.4	5.8	59.2	59.2
Effective Green, g (s)	16.6	9.0	39.0	15.4	7.8	14.6	30.0	84.4	84.4	6.8	61.2	61.2
Actuated g/C Ratio	0.13	0.07	0.30	0.12	0.06	0.11	0.23	0.65	0.65	0.05	0.47	0.47
Clearance Time (s)	4.0	5.4	4.0	4.0	5.4	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.3	2.3	3.0	2.3	2.3	2.3	3.0	4.5	4.5	2.3	4.5	4.5
Lane Grp Cap (vph)	226	112	515	206	112	162	412	2232	924	91	1666	760
v/s Ratio Prot	c0.08	0.02	c0.21	0.03	0.02	0.00	0.17	0.18		0.01	c0.32	
v/s Ratio Perm			0.08			0.00			0.01			0.06
v/c Ratio	0.59	0.22	0.89	0.23	0.39	0.04	0.72	0.28	0.02	0.29	0.69	0.13
Uniform Delay, d1	53.5	57.2	43.5	51.9	58.8	51.5	46.1	9.8	8.1	59.3	27.0	19.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	0.87	0.74	1.00	1.00	1.00
Incremental Delay, d2	3.2	0.6	17.5	0.3	1.3	0.1	5.2	0.1	0.0	1.0	2.4	0.4
Delay (s)	56.7	57.8	61.0	52.3	60.1	51.5	53.3	8.6	6.0	60.3	29.3	19.8
Level of Service	E	E	E	D	E	D	D	A	A	E	C	B
Approach Delay (s)		60.1			54.3			22.3			28.4	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM Average Control Delay	34.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

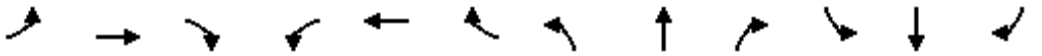
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	191	288	187	701	1248	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1568	1770	1827	3471	1577
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1568	1770	1827	3471	1577
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	199	300	195	730	1300	254
RTOR Reduction (vph)	0	254	0	0	0	83
Lane Group Flow (vph)	199	46	195	730	1300	171
Confl. Peds. (#/hr)	4	1	1			1
Heavy Vehicles (%)	2%	3%	2%	4%	4%	0%
Turn Type		Prot	Prot			Perm
Protected Phases	8	8	1	6	2	
Permitted Phases						2
Actuated Green, G (s)	18.8	18.8	18.9	100.7	77.8	77.8
Effective Green, g (s)	19.8	19.8	19.9	102.7	79.8	79.8
Actuated g/C Ratio	0.15	0.15	0.15	0.79	0.61	0.61
Clearance Time (s)	4.5	4.5	4.0	6.0	6.0	6.0
Vehicle Extension (s)	2.3	2.3	2.3	4.5	4.5	4.5
Lane Grp Cap (vph)	270	239	271	1443	2131	968
v/s Ratio Prot	c0.11	0.03	c0.11	0.40	c0.37	
v/s Ratio Perm						0.11
v/c Ratio	0.74	0.19	0.72	0.51	0.61	0.18
Uniform Delay, d1	52.6	48.1	52.4	4.8	15.5	10.9
Progression Factor	1.00	1.00	1.00	1.00	0.76	0.22
Incremental Delay, d2	9.2	0.2	7.9	1.3	0.9	0.3
Delay (s)	61.8	48.3	60.3	6.0	12.7	2.6
Level of Service	E	D	E	A	B	A
Approach Delay (s)	53.7			17.5	11.1	
Approach LOS	D			B	B	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	4	2	25	5	211	1	642	23	254	1236	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5	3.5	3.0	5.0		3.0	5.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.96			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1762			1608	1563	1805	1799		1805	1819	
Flt Permitted		0.74			0.80	1.00	0.05	1.00		0.31	1.00	
Satd. Flow (perm)		1355			1337	1563	92	1799		583	1819	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	32	4	2	26	5	220	1	669	24	265	1288	47
RTOR Reduction (vph)	0	2	0	0	0	203	0	1	0	0	1	0
Lane Group Flow (vph)	0	36	0	0	31	17	1	692	0	265	1334	0
Confl. Peds. (#/hr)	1					1			1	1		
Heavy Vehicles (%)	3%	0%	0%	16%	0%	1%	0%	5%	4%	0%	4%	2%
Turn Type	Perm			Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		9.0			9.0	9.0	83.3	83.3		109.5	107.5	
Effective Green, g (s)		10.0			10.0	10.0	84.3	84.3		110.5	108.5	
Actuated g/C Ratio		0.08			0.08	0.08	0.64	0.64		0.84	0.82	
Clearance Time (s)		4.5			4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.5			2.5	2.5	2.3	4.5		2.3	4.5	
Lane Grp Cap (vph)		103			101	118	85	1149		731	1495	
v/s Ratio Prot							0.00	c0.38		0.07	c0.73	
v/s Ratio Perm		c0.03			0.02	0.01	0.01			0.23		
v/c Ratio		0.35			0.31	0.14	0.01	0.60		0.36	0.89	
Uniform Delay, d1		57.9			57.7	57.0	24.9	14.0		9.9	7.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.5			1.3	0.4	0.0	2.3		0.2	8.5	
Delay (s)		59.4			59.0	57.4	24.9	16.4		10.1	16.4	
Level of Service		E			E	E	C	B		B	B	
Approach Delay (s)		59.4			57.6			16.4			15.3	
Approach LOS		E			E			B			B	

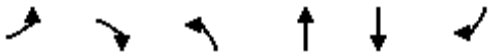
Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	438	968	106	23	481	75	205	94	44	66	53	302
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1786	3483		1804	3450		1787	1799		1719	1900	1578
Flt Permitted	0.22	1.00		0.24	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	421	3483		461	3450		1787	1799		1719	1900	1578
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	476	1052	115	25	523	82	223	102	48	72	58	328
RTOR Reduction (vph)	0	4	0	0	8	0	0	10	0	0	0	99
Lane Group Flow (vph)	476	1163	0	25	597	0	223	140	0	72	58	229
Confl. Peds. (#/hr)	3		4	4		3			4	4		
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	2%	0%	0%	2%	3%	1%	0%	0%	5%	0%	2%
Turn Type	pm+pt			pm+pt			Split			Split		pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases	2			6								4
Actuated Green, G (s)	66.4	58.7		34.1	30.9		19.4	19.4		10.1	10.1	41.1
Effective Green, g (s)	67.4	59.7		36.1	31.9		20.4	20.4		11.1	11.1	43.1
Actuated g/C Ratio	0.62	0.55		0.33	0.29		0.19	0.19		0.10	0.10	0.39
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	2.5	5.2		2.3	5.2		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	659	1901		204	1006		333	335		174	193	672
v/s Ratio Prot	c0.21	0.33		0.00	0.17		c0.12	0.08		c0.04	0.03	0.10
v/s Ratio Perm	c0.23			0.04								0.05
v/c Ratio	0.72	0.61		0.12	0.59		0.67	0.42		0.41	0.30	0.34
Uniform Delay, d1	16.2	16.9		24.9	33.2		41.4	39.3		46.1	45.6	23.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	0.9		0.2	1.5		4.6	0.6		1.2	0.6	0.2
Delay (s)	19.9	17.8		25.1	34.7		45.9	39.9		47.3	46.2	23.4
Level of Service	B	B		C	C		D	D		D	D	C
Approach Delay (s)		18.4			34.3			43.5			30.1	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	109.4	Sum of lost time (s)	10.5
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



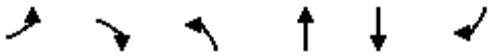
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	59	40	25	476	1038	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1805	1615	1805	1863	1881	1615
Flt Permitted	0.95	1.00	0.07	1.00	1.00	1.00
Satd. Flow (perm)	1805	1615	134	1863	1881	1615
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	66	45	28	535	1166	48
RTOR Reduction (vph)	0	40	0	0	0	6
Lane Group Flow (vph)	66	5	28	535	1166	42
Confl. Peds. (#/hr)			7			7
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%
Turn Type		Prot	pm+pt			pt+ov
Protected Phases	8	8	1	6	2	2 8
Permitted Phases			6			
Actuated Green, G (s)	9.0	9.0	64.4	64.4	57.8	71.3
Effective Green, g (s)	9.0	9.0	64.4	64.4	57.8	71.3
Actuated g/C Ratio	0.11	0.11	0.78	0.78	0.70	0.87
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	2.5	2.5	2.3	5.1	5.1	
Lane Grp Cap (vph)	197	176	147	1456	1319	1397
v/s Ratio Prot	c0.04	0.00	0.00	c0.29	c0.62	0.03
v/s Ratio Perm			0.14			
v/c Ratio	0.34	0.03	0.19	0.37	0.88	0.03
Uniform Delay, d1	33.9	32.8	15.2	2.8	9.7	0.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0	0.4	0.3	7.9	0.0
Delay (s)	34.7	32.8	15.5	3.1	17.6	0.8
Level of Service	C	C	B	A	B	A
Approach Delay (s)	33.9			3.7	16.9	
Approach LOS	C			A	B	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	82.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	18	483	6	37	1041
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	5	20	549	7	42	1183
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1819	552			556	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1819	552			556	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	95	96			96	
cM capacity (veh/h)	83	526			1010	

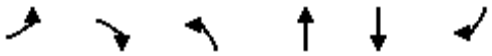
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	556	1225
Volume Left	5	0	42
Volume Right	20	7	0
cSH	266	1700	1010
Volume to Capacity	0.09	0.33	0.04
Queue Length 95th (ft)	8	0	3
Control Delay (s)	19.9	0.0	1.5
Lane LOS	C		A
Approach Delay (s)	19.9	0.0	1.5
Approach LOS	C		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	110	10	11	376	891	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.5	4.8	4.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1615	1805	1827	1834	
Flt Permitted	0.95	1.00	0.08	1.00	1.00	
Satd. Flow (perm)	1805	1615	154	1827	1834	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	11	12	418	990	127
RTOR Reduction (vph)	0	10	0	0	2	0
Lane Group Flow (vph)	122	1	12	418	1115	0
Confl. Peds. (#/hr)			3			3
Heavy Vehicles (%)	0%	0%	0%	4%	2%	0%
Turn Type		Perm	pm+pt			
Protected Phases	8		1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)	9.6	9.6	56.5	56.5	51.0	
Effective Green, g (s)	9.6	9.6	56.5	56.5	51.0	
Actuated g/C Ratio	0.13	0.13	0.75	0.75	0.68	
Clearance Time (s)	4.0	4.0	4.5	4.8	4.8	
Vehicle Extension (s)	2.5	2.5	2.3	2.0	2.0	
Lane Grp Cap (vph)	231	207	138	1378	1249	
v/s Ratio Prot	c0.07		0.00	c0.23	c0.61	
v/s Ratio Perm		0.00	0.06			
v/c Ratio	0.53	0.01	0.09	0.30	0.89	
Uniform Delay, d1	30.5	28.5	12.6	2.9	9.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	0.0	0.2	0.0	8.2	
Delay (s)	32.2	28.5	12.7	3.0	17.9	
Level of Service	C	C	B	A	B	
Approach Delay (s)	31.9			3.2	17.9	
Approach LOS	C			A	B	

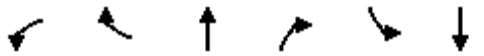
Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	74.9	Sum of lost time (s)	13.6
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	64	18	19	319	736	155
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	67	19	20	336	775	163
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1232	856	938			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1232	856	938			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	65	95	97			
cM capacity (veh/h)	190	360	739			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	86	20	336	938
Volume Left	67	20	0	0
Volume Right	19	0	0	163
cSH	244	739	1700	1700
Volume to Capacity	0.35	0.03	0.20	0.55
Queue Length 95th (ft)	38	2	0	0
Control Delay (s)	29.9	10.0	0.0	0.0
Lane LOS	D	B		
Approach Delay (s)	29.9	0.6		0.0
Approach LOS	D			

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		



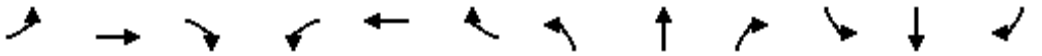
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	62	5	502	102	10	359
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	70	6	570	116	11	408
Pedestrians	2		2			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	0		0			
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)			394			
pX, platoon unblocked	0.80	0.80			0.80	
vC, conflicting volume	1063	630			688	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	950	406			479	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	99			99	
cM capacity (veh/h)	227	515			868	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	76	686	11	408
Volume Left	70	0	11	0
Volume Right	6	116	0	0
cSH	246	1700	868	1700
Volume to Capacity	0.31	0.40	0.01	0.24
Queue Length 95th (ft)	32	0	1	0
Control Delay (s)	26.6	0.0	9.2	0.0
Lane LOS	D		A	
Approach Delay (s)	26.6	0.0	0.2	
Approach LOS	D			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

Attachment E

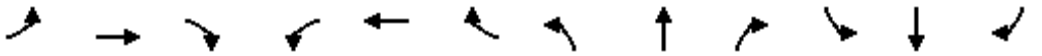
Year 2016 Total Traffic Level-of-Service Worksheets



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	271	365	6	79	437	802	23	1038	68	353	447	563
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	2100	1900	2305	1900	1900	1900	1900
Total Lost time (s)	4.5	3.5		4.5	3.5	4.5	4.5	4.0	4.0	4.5	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3099	3343		3335	3282	1716	1467	4055	1482	3400	3252	1568
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3099	3343		3335	3282	1716	1467	4055	1482	3400	3252	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	298	401	7	87	480	881	25	1141	75	388	491	619
RTOR Reduction (vph)	0	1	0	0	0	14	0	0	52	0	0	266
Lane Group Flow (vph)	298	407	0	87	480	867	25	1141	23	388	491	353
Confl. Peds. (#/hr)			17	17								
Heavy Vehicles (%)	13%	7%	33%	5%	10%	4%	23%	8%	9%	3%	11%	3%
Bus Blockages (#/hr)	0	1	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4	5	1	6		5	2	
Permitted Phases						4			6			2
Actuated Green, G (s)	17.6	29.1		8.5	20.0	64.0	5.1	42.2	42.2	44.0	81.1	81.1
Effective Green, g (s)	18.6	31.1		9.5	22.0	66.0	6.1	45.2	45.2	45.0	84.1	84.1
Actuated g/C Ratio	0.13	0.21		0.06	0.15	0.45	0.04	0.31	0.31	0.31	0.57	0.57
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	391	706		215	490	769	61	1244	455	1039	1857	895
v/s Ratio Prot	c0.10	0.12		0.03	0.15	c0.34	0.02	c0.28		0.11	0.15	
v/s Ratio Perm						0.16			0.02			0.23
v/c Ratio	0.76	0.58		0.40	0.98	1.13	0.41	0.92	0.05	0.37	0.26	0.39
Uniform Delay, d1	62.2	52.2		66.2	62.4	40.7	68.8	49.2	35.9	40.1	16.0	17.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.0	0.8		0.7	34.9	73.6	2.6	11.1	0.1	0.1	0.1	0.5
Delay (s)	70.2	53.0		66.9	97.3	114.3	71.4	60.3	36.0	40.2	16.1	18.0
Level of Service	E	D		E	F	F	E	E	D	D	B	B
Approach Delay (s)		60.3			105.8			59.1			23.2	
Approach LOS		E			F			E			C	

Intersection Summary			
HCM Average Control Delay	62.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	147.3	Sum of lost time (s)	17.5
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



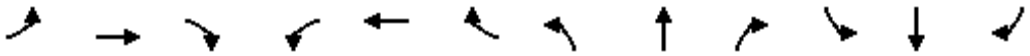
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	37	120	14	24	9	276	1032	54	35	384	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.4	3.0	3.0	4.4	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1515	1583	1520	1206	1770	3343	1521	1626	3252	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1719	1810	1515	1583	1520	1206	1770	3343	1521	1626	3252	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	89	39	126	15	25	9	291	1086	57	37	404	113
RTOR Reduction (vph)	0	0	85	0	0	8	0	0	7	0	0	56
Lane Group Flow (vph)	89	39	41	15	25	1	291	1086	50	37	404	57
Confl. Peds. (#/hr)	2		7	7		2						
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	6%	14%	25%	33%	2%	8%	4%	11%	11%	5%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	3	8	1	7	4	5	1	6		5	2	
Permitted Phases			8			4			6			2
Actuated Green, G (s)	11.3	10.8	37.1	5.3	4.8	10.1	26.3	79.2	79.2	5.3	58.2	58.2
Effective Green, g (s)	12.3	11.8	39.1	6.3	5.8	12.1	27.3	81.2	81.2	6.3	60.2	60.2
Actuated g/C Ratio	0.10	0.10	0.33	0.05	0.05	0.10	0.23	0.68	0.68	0.05	0.50	0.50
Clearance Time (s)	4.0	5.4	4.0	4.0	5.4	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.3	2.3	3.0	2.3	2.3	2.3	3.0	4.5	4.5	2.3	4.5	4.5
Lane Grp Cap (vph)	176	178	532	83	73	122	403	2262	1029	85	1631	772
v/s Ratio Prot	c0.05	0.02	0.02	0.01	c0.02	0.00	c0.16	c0.32		c0.02	0.12	
v/s Ratio Perm			0.01			0.00			0.03			0.04
v/c Ratio	0.51	0.22	0.08	0.18	0.34	0.01	0.72	0.48	0.05	0.44	0.25	0.07
Uniform Delay, d1	51.0	49.9	28.0	54.4	55.3	48.5	42.8	9.3	6.5	55.1	17.0	15.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.96	1.02	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.4	0.1	0.6	1.6	0.0	2.1	0.1	0.0	2.1	0.4	0.2
Delay (s)	52.3	50.2	28.0	55.0	56.9	48.6	42.6	9.0	6.6	57.2	17.4	15.7
Level of Service	D	D	C	D	E	D	D	A	A	E	B	B
Approach Delay (s)		39.9			54.8			15.8			19.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

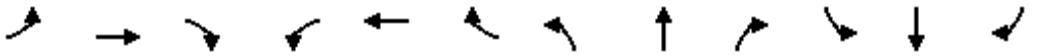
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	218	223	170	1151	427	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1719	1583	1719	1776	3252	1503
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1719	1583	1719	1776	3252	1503
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	251	256	195	1323	491	70
RTOR Reduction (vph)	0	213	0	0	0	29
Lane Group Flow (vph)	251	43	195	1323	491	41
Confl. Peds. (#/hr)	6	1	1			1
Heavy Vehicles (%)	5%	2%	5%	7%	11%	5%
Turn Type		Prot	Prot			Perm
Protected Phases	8	8	1	6	2	
Permitted Phases						2
Actuated Green, G (s)	19.1	19.1	18.2	90.4	68.2	68.2
Effective Green, g (s)	20.1	20.1	19.2	92.4	70.2	70.2
Actuated g/C Ratio	0.17	0.17	0.16	0.77	0.59	0.59
Clearance Time (s)	4.5	4.5	4.0	6.0	6.0	6.0
Vehicle Extension (s)	2.3	2.3	2.3	4.5	4.5	4.5
Lane Grp Cap (vph)	288	265	275	1368	1902	879
v/s Ratio Prot	c0.15	0.03	0.11	c0.75	0.15	
v/s Ratio Perm						0.03
v/c Ratio	0.87	0.16	0.71	0.97	0.26	0.05
Uniform Delay, d1	48.7	42.7	47.8	12.4	12.2	10.6
Progression Factor	1.00	1.00	1.00	1.00	0.95	1.12
Incremental Delay, d2	23.5	0.2	7.2	17.6	0.3	0.1
Delay (s)	72.2	42.9	55.0	30.1	11.9	12.0
Level of Service	E	D	D	C	B	B
Approach Delay (s)	57.4			33.3	11.9	
Approach LOS	E			C	B	

Intersection Summary			
HCM Average Control Delay	33.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	13	8	31	2	341	2	902	23	186	447	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5	3.5	3.0	5.0		3.0	5.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1731			1748	1548	1805	1733		1770	1710	
Flt Permitted		0.82			0.74	1.00	0.39	1.00		0.06	1.00	
Satd. Flow (perm)		1453			1358	1548	739	1733		105	1710	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	35	15	10	37	2	406	2	1074	27	221	532	27
RTOR Reduction (vph)	0	6	0	0	0	291	0	1	0	0	1	0
Lane Group Flow (vph)	0	54	0	0	39	115	2	1100	0	221	558	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	7%	0%	0%	4%	0%	2%	0%	9%	19%	2%	10%	17%
Turn Type	Perm			Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		12.1			12.1	12.1	70.2	70.2		96.4	94.4	
Effective Green, g (s)		13.1			13.1	13.1	71.2	71.2		97.4	95.4	
Actuated g/C Ratio		0.11			0.11	0.11	0.58	0.58		0.80	0.78	
Clearance Time (s)		4.5			4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.5			2.5	2.5	2.3	4.5		2.3	4.5	
Lane Grp Cap (vph)		156			146	166	449	1011		441	1337	
v/s Ratio Prot							0.00	c0.63		c0.11	0.33	
v/s Ratio Perm		0.04			0.03	c0.07	0.00			0.29		
v/c Ratio		0.34			0.27	0.69	0.00	1.09		0.50	0.42	
Uniform Delay, d1		50.5			50.0	52.5	11.0	25.4		37.9	4.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0			0.7	10.9	0.0	55.4		0.5	1.0	
Delay (s)		51.4			50.8	63.4	11.0	80.8		38.4	5.3	
Level of Service		D			D	E	B	F		D	A	
Approach Delay (s)		51.4			62.3			80.7			14.7	
Approach LOS		D			E			F			B	

Intersection Summary			
HCM Average Control Delay	55.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	122.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	566	57	4	917	76	95	17	15	179	28	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1687	3385		1434	3341		1671	1708		1703	1900	1568
Flt Permitted	0.10	1.00		0.37	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	169	3385		558	3341		1671	1708		1703	1900	1568
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	149	674	68	5	1092	90	113	20	18	213	33	350
RTOR Reduction (vph)	0	4	0	0	3	0	0	15	0	0	0	123
Lane Group Flow (vph)	149	738	0	5	1179	0	113	23	0	213	33	227
Confl. Peds. (#/hr)	2		15	15		2						
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	7%	4%	9%	25%	6%	14%	8%	0%	7%	6%	0%	3%
Turn Type	pm+pt			pm+pt			Split			Split		pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases	2			6								4
Actuated Green, G (s)	83.1	77.6		63.6	62.6		21.8	21.8		21.6	21.6	37.6
Effective Green, g (s)	84.1	78.6		65.6	63.6		22.8	22.8		22.6	22.6	39.6
Actuated g/C Ratio	0.60	0.56		0.47	0.45		0.16	0.16		0.16	0.16	0.28
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	2.5	5.2		2.3	5.2		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	286	1900		274	1518		272	278		275	307	483
v/s Ratio Prot	c0.06	0.22		0.00	c0.35		c0.07	0.01		c0.13	0.02	c0.06
v/s Ratio Perm	0.25			0.01								0.09
v/c Ratio	0.52	0.39		0.02	0.78		0.42	0.08		0.77	0.11	0.47
Uniform Delay, d1	21.2	17.2		19.8	32.2		52.6	49.7		56.3	50.1	41.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.3		0.0	3.1		0.8	0.1		12.3	0.1	0.5
Delay (s)	22.5	17.5		19.9	35.3		53.4	49.8		68.5	50.2	42.0
Level of Service	C	B		B	D		D	D		E	D	D
Approach Delay (s)		18.4			35.2			52.5			52.0	
Approach LOS		B			D			D			D	

Intersection Summary			
HCM Average Control Delay	34.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	9	25	36	984	682	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1626	1553	1805	1792	1810	1568
Flt Permitted	0.95	1.00	0.22	1.00	1.00	1.00
Satd. Flow (perm)	1626	1553	410	1792	1810	1568
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	12	33	48	1312	909	95
RTOR Reduction (vph)	0	31	0	0	0	15
Lane Group Flow (vph)	12	2	48	1312	909	80
Confl. Peds. (#/hr)			7			7
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	11%	4%	0%	6%	5%	3%
Turn Type		Prot	pm+pt			pt+ov
Protected Phases	8	8	1	6	2	2 8
Permitted Phases			6			
Actuated Green, G (s)	4.9	4.9	71.4	71.4	62.7	72.1
Effective Green, g (s)	4.9	4.9	71.4	71.4	62.7	72.1
Actuated g/C Ratio	0.06	0.06	0.84	0.84	0.74	0.85
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	2.5	2.5	2.3	5.1	5.1	
Lane Grp Cap (vph)	93	89	412	1500	1330	1325
v/s Ratio Prot	c0.01	0.00	0.01	c0.73	0.50	0.05
v/s Ratio Perm			0.09			
v/c Ratio	0.13	0.02	0.12	0.87	0.68	0.06
Uniform Delay, d1	38.2	37.9	4.5	4.2	6.0	1.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1	0.1	6.5	1.9	0.0
Delay (s)	38.6	38.0	4.6	10.7	7.9	1.1
Level of Service	D	D	A	B	A	A
Approach Delay (s)	38.2			10.5	7.3	
Approach LOS	D			B	A	

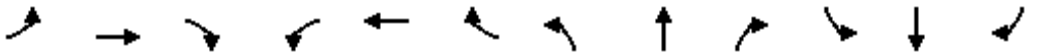
Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	85.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	7	35	985	5	10	697
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	10	48	1349	7	14	955
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2335	1353			1356	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2335	1353			1356	
tC, single (s)	6.7	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.4			2.2	
p0 queue free %	70	72			97	
cM capacity (veh/h)	32	173			514	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	58	1356	968
Volume Left	10	0	14
Volume Right	48	7	0
cSH	100	1700	514
Volume to Capacity	0.57	0.80	0.03
Queue Length 95th (ft)	67	0	2
Control Delay (s)	80.7	0.0	0.9
Lane LOS	F		A
Approach Delay (s)	80.7	0.0	0.9
Approach LOS	F		

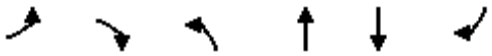
Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	301	0	32	26	0	21	106	659	12	10	186	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.8		4.8	4.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.85		1.00	1.00		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	1482		1805	1615		1805	1858		1805	1683	
Flt Permitted	0.95	1.00		0.73	1.00		0.24	1.00		0.15	1.00	
Satd. Flow (perm)	1641	1482		1383	1615		453	1858		279	1683	
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	424	0	45	37	0	30	149	928	17	14	262	211
RTOR Reduction (vph)	0	30	0	0	20	0	0	1	0	0	29	0
Lane Group Flow (vph)	424	15	0	37	10	0	149	944	0	14	444	0
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	10%	0%	9%	0%	0%	0%	0%	2%	0%	0%	6%	2%
Turn Type	Prot			Perm			pm+pt			Perm		
Protected Phases	8!	4			8!		1	6			2	
Permitted Phases				8			6			2		
Actuated Green, G (s)	25.2	25.2		25.2	25.2		39.9	39.9		27.2	27.2	
Effective Green, g (s)	25.2	25.2		25.2	25.2		39.9	39.9		27.2	27.2	
Actuated g/C Ratio	0.34	0.34		0.34	0.34		0.54	0.54		0.37	0.37	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.8		4.8	4.8	
Vehicle Extension (s)	2.5	3.0		2.5	2.5		2.3	2.0		2.0	2.0	
Lane Grp Cap (vph)	560	505		472	551		395	1003		103	619	
v/s Ratio Prot	c0.26	0.01			0.01		0.04	c0.51			0.26	
v/s Ratio Perm				0.03			0.16			0.05		
v/c Ratio	0.76	0.03		0.08	0.02		0.38	0.94		0.14	0.72	
Uniform Delay, d1	21.6	16.2		16.5	16.1		10.7	15.9		15.5	20.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.5	0.0		0.1	0.0		0.4	16.0		0.2	3.3	
Delay (s)	27.2	16.2		16.5	16.2		11.0	31.9		15.8	23.4	
Level of Service	C	B		B	B		B	C		B	C	
Approach Delay (s)		26.1			16.4			29.0			23.1	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	26.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	73.9	Sum of lost time (s)	8.8
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

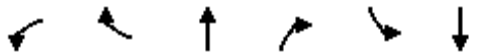
! Phase conflict between lane groups.
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	92	41	51	684	185	61
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	112	50	62	834	226	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1221	263	300			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1221	263	300			
tC, single (s)	6.4	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.3			
p0 queue free %	40	93	95			
cM capacity (veh/h)	188	757	1217			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	162	62	834	300
Volume Left	112	62	0	0
Volume Right	50	0	0	74
cSH	272	1217	1700	1700
Volume to Capacity	0.60	0.05	0.49	0.18
Queue Length 95th (ft)	88	4	0	0
Control Delay (s)	36.9	8.1	0.0	0.0
Lane LOS	E	A		
Approach Delay (s)	36.9	0.6		0.0
Approach LOS	E			

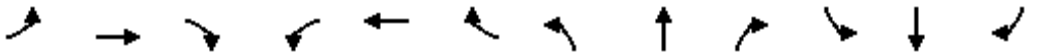
Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	81	13	189	28	4	419
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	99	16	230	34	5	511
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)			394			
pX, platoon unblocked	0.97	0.97			0.97	
vC, conflicting volume	768	249			265	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	742	204			220	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	73	98			100	
cM capacity (veh/h)	370	793			1314	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	115	265	5	511
Volume Left	99	0	5	0
Volume Right	16	34	0	0
cSH	429	1700	1314	1700
Volume to Capacity	0.27	0.16	0.00	0.30
Queue Length 95th (ft)	27	0	0	0
Control Delay (s)	17.1	0.0	7.8	0.0
Lane LOS	C		A	
Approach Delay (s)	17.1	0.0	0.1	
Approach LOS	C			

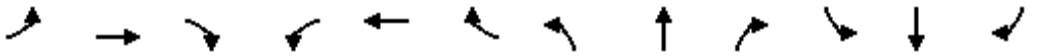
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	574	769	79	152	444	418	30	601	169	816	1111	604
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	3.5		4.5	3.5	4.5	4.5	4.0	4.0	4.5	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3510		3502	3574	1559	1752	3406	1549	3467	3505	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3510		3502	3574	1559	1752	3406	1549	3467	3505	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	592	793	81	157	458	431	31	620	174	841	1145	623
RTOR Reduction (vph)	0	4	0	0	0	22	0	0	127	0	0	311
Lane Group Flow (vph)	592	870	0	157	458	409	31	620	47	841	1145	312
Confl. Peds. (#/hr)	2		11	11		2			8	8		
Heavy Vehicles (%)	1%	1%	1%	0%	1%	3%	3%	6%	2%	1%	3%	1%
Bus Blockages (#/hr)	0	1	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4	5	1	6		5	2	
Permitted Phases						4			6			2
Actuated Green, G (s)	20.5	34.2		11.0	24.7	62.2	4.8	35.2	35.2	37.5	67.9	67.9
Effective Green, g (s)	21.5	36.2		12.0	26.7	64.2	5.8	38.2	38.2	38.5	70.9	70.9
Actuated g/C Ratio	0.15	0.26		0.08	0.19	0.45	0.04	0.27	0.27	0.27	0.50	0.50
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	527	899		297	675	708	72	920	418	944	1757	802
v/s Ratio Prot	0.17	c0.25		0.04	c0.13	0.16	0.02	0.18		c0.24	c0.33	
v/s Ratio Perm						0.11			0.03			0.20
v/c Ratio	1.12	0.97		0.53	0.68	0.58	0.43	0.67	0.11	0.89	0.65	0.39
Uniform Delay, d1	60.0	52.0		62.0	53.4	28.6	66.2	46.0	38.8	49.4	26.1	21.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	77.7	22.1		1.1	2.3	0.9	2.4	2.4	0.2	10.4	1.1	0.6
Delay (s)	137.7	74.1		63.1	55.7	29.4	68.6	48.5	39.1	59.9	27.2	22.4
Level of Service	F	E		E	E	C	E	D	D	E	C	C
Approach Delay (s)		99.8			46.0			47.2			36.6	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM Average Control Delay	55.3	HCM Level of Service	E
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	141.4	Sum of lost time (s)	11.5
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



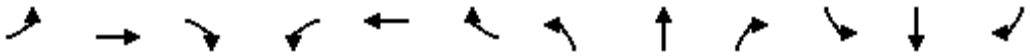
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	129	24	515	46	42	56	293	610	28	25	1104	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.4	3.0	3.0	4.4	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1624	1594	1736	1863	1443	1787	3438	1423	1736	3539	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1624	1594	1736	1863	1443	1787	3438	1423	1736	3539	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	134	25	536	48	44	58	305	635	29	26	1150	215
RTOR Reduction (vph)	0	0	64	0	0	51	0	0	8	0	0	114
Lane Group Flow (vph)	134	25	472	48	44	7	305	635	21	26	1150	101
Confl. Peds. (#/hr)	2		2	2		2			1	1		
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	2%	17%	1%	4%	2%	11%	1%	5%	11%	4%	2%	0%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	3	8	1	7	4	5	1	6		5	2	
Permitted Phases			8			4			6			2
Actuated Green, G (s)	15.6	8.0	37.2	14.4	6.8	12.6	29.2	82.4	82.4	5.8	59.0	59.0
Effective Green, g (s)	16.6	9.0	39.2	15.4	7.8	14.6	30.2	84.4	84.4	6.8	61.0	61.0
Actuated g/C Ratio	0.13	0.07	0.30	0.12	0.06	0.11	0.23	0.65	0.65	0.05	0.47	0.47
Clearance Time (s)	4.0	5.4	4.0	4.0	5.4	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	2.3	2.3	3.0	2.3	2.3	2.3	3.0	4.5	4.5	2.3	4.5	4.5
Lane Grp Cap (vph)	226	112	517	206	112	162	415	2232	924	91	1661	758
v/s Ratio Prot	c0.08	0.02	c0.21	0.03	0.02	0.00	0.17	0.18		0.01	c0.32	
v/s Ratio Perm			0.08			0.00			0.01			0.06
v/c Ratio	0.59	0.22	0.91	0.23	0.39	0.04	0.73	0.28	0.02	0.29	0.69	0.13
Uniform Delay, d1	53.5	57.2	43.7	51.9	58.8	51.5	46.2	9.8	8.1	59.3	27.1	19.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	0.86	0.75	1.00	1.00	1.00
Incremental Delay, d2	3.2	0.6	20.4	0.3	1.3	0.1	5.8	0.1	0.0	1.0	2.4	0.4
Delay (s)	56.7	57.8	64.2	52.3	60.1	51.5	53.9	8.6	6.1	60.3	29.5	19.9
Level of Service	E	E	E	D	E	D	D	A	A	E	C	B
Approach Delay (s)		62.5			54.3			22.8			28.6	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM Average Control Delay	35.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

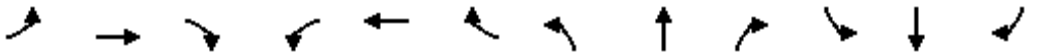
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	191	292	191	710	1260	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1568	1770	1827	3471	1577
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1568	1770	1827	3471	1577
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	199	304	199	740	1312	254
RTOR Reduction (vph)	0	258	0	0	0	83
Lane Group Flow (vph)	199	46	199	740	1312	171
Confl. Peds. (#/hr)	4	1	1			1
Heavy Vehicles (%)	2%	3%	2%	4%	4%	0%
Turn Type		Prot	Prot			Perm
Protected Phases	8	8	1	6	2	
Permitted Phases						2
Actuated Green, G (s)	18.8	18.8	19.1	100.7	77.6	77.6
Effective Green, g (s)	19.8	19.8	20.1	102.7	79.6	79.6
Actuated g/C Ratio	0.15	0.15	0.15	0.79	0.61	0.61
Clearance Time (s)	4.5	4.5	4.0	6.0	6.0	6.0
Vehicle Extension (s)	2.3	2.3	2.3	4.5	4.5	4.5
Lane Grp Cap (vph)	270	239	274	1443	2125	966
v/s Ratio Prot	c0.11	0.03	c0.11	0.41	c0.38	
v/s Ratio Perm						0.11
v/c Ratio	0.74	0.19	0.73	0.51	0.62	0.18
Uniform Delay, d1	52.6	48.1	52.3	4.8	15.7	11.0
Progression Factor	1.00	1.00	1.00	1.00	0.77	0.24
Incremental Delay, d2	9.2	0.2	8.3	1.3	0.9	0.3
Delay (s)	61.8	48.4	60.7	6.1	13.1	2.9
Level of Service	E	D	E	A	B	A
Approach Delay (s)	53.7			17.7	11.4	
Approach LOS	D			B	B	

Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	4	2	28	5	224	1	642	28	270	1236	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5	3.5	3.0	5.0		3.0	5.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.96			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1762			1603	1563	1805	1797		1805	1819	
Flt Permitted		0.74			0.79	1.00	0.05	1.00		0.30	1.00	
Satd. Flow (perm)		1354			1321	1563	93	1797		576	1819	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	32	4	2	29	5	233	1	669	29	281	1288	47
RTOR Reduction (vph)	0	2	0	0	0	215	0	1	0	0	1	0
Lane Group Flow (vph)	0	36	0	0	34	18	1	697	0	281	1334	0
Confl. Peds. (#/hr)	1					1			1	1		
Heavy Vehicles (%)	3%	0%	0%	16%	0%	1%	0%	5%	4%	0%	4%	2%
Turn Type	Perm			Perm		Perm	pm+pt			pm+pt		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		9.2			9.2	9.2	83.1	83.1		109.3	107.3	
Effective Green, g (s)		10.2			10.2	10.2	84.1	84.1		110.3	108.3	
Actuated g/C Ratio		0.08			0.08	0.08	0.64	0.64		0.84	0.82	
Clearance Time (s)		4.5			4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.5			2.5	2.5	2.3	4.5		2.3	4.5	
Lane Grp Cap (vph)		105			102	121	85	1145		725	1492	
v/s Ratio Prot							0.00	c0.39		0.08	c0.73	
v/s Ratio Perm		c0.03			0.03	0.01	0.01			0.25		
v/c Ratio		0.34			0.33	0.15	0.01	0.61		0.39	0.89	
Uniform Delay, d1		57.7			57.7	56.8	25.3	14.2		10.6	8.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.4			1.4	0.4	0.0	2.4		0.2	8.6	
Delay (s)		59.2			59.1	57.3	25.3	16.6		10.8	16.6	
Level of Service		E			E	E	C	B		B	B	
Approach Delay (s)		59.2			57.5			16.6			15.6	
Approach LOS		E			E			B			B	

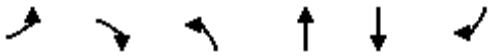
Intersection Summary			
HCM Average Control Delay	20.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	438	982	106	23	492	81	205	94	44	73	53	302
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	3484		1804	3446		1787	1799		1719	1900	1578
Flt Permitted	0.22	1.00		0.24	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	406	3484		454	3446		1787	1799		1719	1900	1578
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	476	1067	115	25	535	88	223	102	48	79	58	328
RTOR Reduction (vph)	0	4	0	0	8	0	0	10	0	0	0	96
Lane Group Flow (vph)	476	1178	0	25	615	0	223	140	0	79	58	232
Confl. Peds. (#/hr)	3		4	4		3			4	4		
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	2%	0%	0%	2%	3%	1%	0%	0%	5%	0%	2%
Turn Type	pm+pt			pm+pt			Split			Split		pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases	2			6								4
Actuated Green, G (s)	68.2	60.5		35.3	32.1		19.6	19.6		10.7	10.7	42.3
Effective Green, g (s)	69.2	61.5		37.3	33.1		20.6	20.6		11.7	11.7	44.3
Actuated g/C Ratio	0.62	0.55		0.33	0.30		0.18	0.18		0.10	0.10	0.40
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	2.5	5.2		2.3	5.2		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	653	1913		202	1018		329	331		180	198	673
v/s Ratio Prot	c0.21	0.34		0.00	0.18		c0.12	0.08		c0.05	0.03	0.10
v/s Ratio Perm	c0.24			0.04								0.05
v/c Ratio	0.73	0.62		0.12	0.60		0.68	0.42		0.44	0.29	0.34
Uniform Delay, d1	17.3	17.2		25.3	33.8		42.6	40.4		47.1	46.3	23.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	0.9		0.2	1.6		5.0	0.6		1.2	0.6	0.2
Delay (s)	21.1	18.1		25.4	35.4		47.6	41.1		48.3	46.9	23.9
Level of Service	C	B		C	D		D	D		D	D	C
Approach Delay (s)		19.0			35.0			45.0			30.9	
Approach LOS		B			D			D			C	

Intersection Summary			
HCM Average Control Delay	27.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



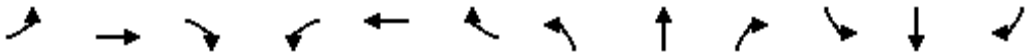
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	59	40	25	493	1059	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1805	1615	1805	1863	1881	1615
Flt Permitted	0.95	1.00	0.06	1.00	1.00	1.00
Satd. Flow (perm)	1805	1615	122	1863	1881	1615
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	66	45	28	554	1190	48
RTOR Reduction (vph)	0	40	0	0	0	6
Lane Group Flow (vph)	66	5	28	554	1190	42
Confl. Peds. (#/hr)			7			7
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%
Turn Type		Prot	pm+pt			pt+ov
Protected Phases	8	8	1	6	2	2 8
Permitted Phases			6			
Actuated Green, G (s)	9.0	9.0	64.4	64.4	57.8	71.3
Effective Green, g (s)	9.0	9.0	64.4	64.4	57.8	71.3
Actuated g/C Ratio	0.11	0.11	0.78	0.78	0.70	0.87
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	2.5	2.5	2.3	5.1	5.1	
Lane Grp Cap (vph)	197	176	138	1456	1319	1397
v/s Ratio Prot	c0.04	0.00	0.01	c0.30	c0.63	0.03
v/s Ratio Perm			0.15			
v/c Ratio	0.34	0.03	0.20	0.38	0.90	0.03
Uniform Delay, d1	33.9	32.8	16.7	2.8	10.0	0.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0	0.4	0.4	9.4	0.0
Delay (s)	34.7	32.8	17.2	3.2	19.4	0.8
Level of Service	C	C	B	A	B	A
Approach Delay (s)	33.9			3.8	18.7	
Approach LOS	C			A	B	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	82.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	18	500	6	37	1062
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	5	20	568	7	42	1207
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1862	572			575	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1862	572			575	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	94	96			96	
cM capacity (veh/h)	78	512			993	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	575	1249
Volume Left	5	0	42
Volume Right	20	7	0
cSH	254	1700	993
Volume to Capacity	0.10	0.34	0.04
Queue Length 95th (ft)	8	0	3
Control Delay (s)	20.7	0.0	1.5
Lane LOS	C		A
Approach Delay (s)	20.7	0.0	1.5
Approach LOS	C		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

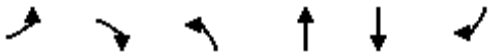


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	0	10	20	0	17	11	376	25	21	891	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.8			4.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.85		1.00	0.85		1.00	0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1805	1615		1805	1615		1805	1814			1833	
Flt Permitted	0.95	1.00		0.75	1.00		0.22	1.00			0.99	
Satd. Flow (perm)	1805	1615		1426	1615		427	1814			1813	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	0	11	22	0	19	12	418	28	23	990	127
RTOR Reduction (vph)	0	10	0	0	17	0	0	1	0	0	2	0
Lane Group Flow (vph)	122	1	0	22	2	0	12	445	0	0	1138	0
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	2%	0%
Turn Type	Prot			Perm			pm+pt			Perm		
Protected Phases	8!	4			8!		1	6			2	
Permitted Phases				8			6			2		
Actuated Green, G (s)	9.6	9.6		9.6	9.6		55.0	55.0			49.6	
Effective Green, g (s)	9.6	9.6		9.6	9.6		55.0	55.0			49.6	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.75	0.75			0.68	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.8			4.8	
Vehicle Extension (s)	2.5	3.0		2.5	2.5		2.3	2.0			2.0	
Lane Grp Cap (vph)	236	211		187	211		337	1359			1225	
v/s Ratio Prot	c0.07	0.00			0.00		0.00	c0.25				
v/s Ratio Perm				0.02			0.03				c0.63	
v/c Ratio	0.52	0.01		0.12	0.01		0.04	0.33			0.93	
Uniform Delay, d1	29.7	27.8		28.2	27.8		4.1	3.1			10.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	1.4	0.0		0.2	0.0		0.0	0.1			12.0	
Delay (s)	31.2	27.8		28.4	27.8		4.2	3.1			22.3	
Level of Service	C	C		C	C		A	A			C	
Approach Delay (s)		30.9			28.1			3.1			22.3	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	73.4	Sum of lost time (s)	13.6
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		

! Phase conflict between lane groups.

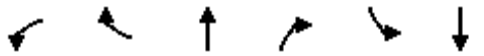
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	85	18	19	323	740	171
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	89	19	20	340	779	180
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1249	869	959			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1249	869	959			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	52	95	97			
cM capacity (veh/h)	186	354	725			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	108	20	340	959
Volume Left	89	20	0	0
Volume Right	19	0	0	180
cSH	225	725	1700	1700
Volume to Capacity	0.48	0.03	0.20	0.56
Queue Length 95th (ft)	60	2	0	0
Control Delay (s)	36.7	10.1	0.0	0.0
Lane LOS	E	B		
Approach Delay (s)	36.7	0.6		0.0
Approach LOS	E			

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	62	5	508	102	10	366
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	70	6	577	116	11	416
Pedestrians	2		2			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	0		0			
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)			394			
pX, platoon unblocked	0.80	0.80			0.80	
vC, conflicting volume	1078	637			695	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	969	415			488	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	68	99			99	
cM capacity (veh/h)	222	509			862	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	76	693	11	416
Volume Left	70	0	11	0
Volume Right	6	116	0	0
cSH	240	1700	862	1700
Volume to Capacity	0.32	0.41	0.01	0.24
Queue Length 95th (ft)	33	0	1	0
Control Delay (s)	27.4	0.0	9.2	0.0
Lane LOS	D		A	
Approach Delay (s)	27.4	0.0	0.2	
Approach LOS	D			

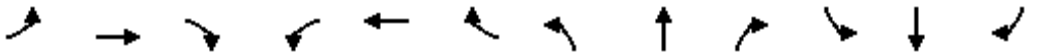
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

Attachment F

Year 2027 Background and Total Traffic Level-of-Service Worksheets (183 residential units)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	275	150	275	50	300	97	175	750	50	300	1750	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		4.0	3.5		3.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1657		1770	1795		1770	1812		1770	3471	1577
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1657		1770	1795		1770	1812		1770	3471	1577
Peak-hour factor, PHF	0.96	0.95	0.96	0.95	0.95	0.95	0.96	0.96	0.95	0.95	0.96	0.96
Adj. Flow (vph)	286	158	286	53	316	102	182	781	53	316	1823	309
RTOR Reduction (vph)	0	49	0	0	9	0	0	2	0	0	0	90
Lane Group Flow (vph)	286	395	0	53	409	0	182	832	0	316	1823	219
Confl. Peds. (#/hr)	4		1				1					1
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%	4%	2%	2%	4%	0%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												2
Actuated Green, G (s)	17.0	38.3		4.0	25.3		10.0	50.2		19.0	59.2	59.2
Effective Green, g (s)	18.0	38.3		4.0	26.3		11.0	52.2		19.0	61.2	61.2
Actuated g/C Ratio	0.14	0.29		0.03	0.20		0.08	0.40		0.15	0.47	0.47
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	2.3		3.0	2.3		2.3	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	245	488		54	363		150	728		259	1634	742
v/s Ratio Prot	c0.16	0.24		0.03	c0.23		0.10	0.46		c0.18	c0.53	
v/s Ratio Perm												0.14
v/c Ratio	1.17	0.81		0.98	1.13		1.21	1.14		1.22	1.12	0.29
Uniform Delay, d1	56.0	42.5		63.0	51.9		59.5	38.9		55.5	34.4	21.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	110.3	9.2		115.3	86.4		142.1	80.3		128.7	61.1	1.0
Delay (s)	166.3	51.6		178.2	138.3		201.6	119.2		184.2	95.5	22.1
Level of Service	F	D		F	F		F	F		F	F	C
Approach Delay (s)		96.6			142.8			133.9			97.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	110.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	109.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	275	154	275	50	304	106	175	750	50	312	1750	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		4.0	3.5		3.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1659		1770	1790		1770	1812		1770	3471	1577
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1659		1770	1790		1770	1812		1770	3471	1577
Peak-hour factor, PHF	0.96	0.95	0.96	0.95	0.95	0.95	0.96	0.96	0.95	0.95	0.96	0.96
Adj. Flow (vph)	286	162	286	53	320	112	182	781	53	328	1823	309
RTOR Reduction (vph)	0	48	0	0	10	0	0	2	0	0	0	90
Lane Group Flow (vph)	286	400	0	53	422	0	182	832	0	328	1823	219
Confl. Peds. (#/hr)	4		1				1					1
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%	4%	2%	2%	4%	0%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												2
Actuated Green, G (s)	17.0	38.3		4.0	25.3		10.0	50.2		19.0	59.2	59.2
Effective Green, g (s)	18.0	38.3		4.0	26.3		11.0	52.2		19.0	61.2	61.2
Actuated g/C Ratio	0.14	0.29		0.03	0.20		0.08	0.40		0.15	0.47	0.47
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	2.3		3.0	2.3		2.3	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	245	489		54	362		150	728		259	1634	742
v/s Ratio Prot	c0.16	0.24		0.03	c0.24		0.10	0.46		c0.19	c0.53	
v/s Ratio Perm												0.14
v/c Ratio	1.17	0.82		0.98	1.17		1.21	1.14		1.27	1.12	0.29
Uniform Delay, d1	56.0	42.6		63.0	51.9		59.5	38.9		55.5	34.4	21.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	110.3	9.9		115.3	101.0		142.1	80.3		146.9	61.1	1.0
Delay (s)	166.3	52.5		178.2	152.8		201.6	119.2		202.4	95.5	22.1
Level of Service	F	D		F	F		F	F		F	F	C
Approach Delay (s)		96.8			155.6			133.9			100.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	112.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	110.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Attachment G

Year 2027 Total Traffic Level-of-Service Worksheets (196 residential uunits)

196 RESIDENTIAL UNITS SENSITIVITY ANALYSIS

Additional detail of the unit breakdown, trip generation, and operations summary for the sensitivity analysis is included is provided below.

Table G-1 Estimated Trip Generation (Sensitivity Analysis for 196 units)

Land Use	Size (units)	Daily Trips[1]	Weekday AM Peak Hour			Weekday PM Peak Hour		
			Total	In	Out	Total	In	Out
Mid-Rise Apartment (ITE Code 223)	160	620[1]	48	15	33	62	36	26
Rental Townhouse (ITE Code 224)	36	260[1]	25	8	17	26	13	13
Total	**196**	**880[1]**	**73**	**23**	**50**	**88**	**49**	**39**

[1] Estimated as 10-times the weekday p.m. peak hour trip generation

Table G-2 Year 2027 Total Traffic Volumes at the Beavercreek Road/Meyers Road Intersection (Sensitivity Analysis for 196 units)

Movement	2027 Background Traffic Volumes	Site Added Traffic (no Meyers Road extension assumed)	Re-routed Site Added Traffic (assumes Meyers Road extension)	2027 Total Traffic Volumes
Northbound Left	175	4	--	175
Northbound Through	750	10	--	750
Northbound Right	50	--	--	50
Southbound Left	300	--	12	312
Southbound Through	1,750	12	--	1,750
Southbound Right	297	--	--	297
Eastbound Left	275	--	--	275
Eastbound Through	150	--	5	155
Eastbound Right	275	5	--	275
Westbound Left	50	--	--	50
Westbound Through	300	--	4	304
Westbound Right	97	--	10	107

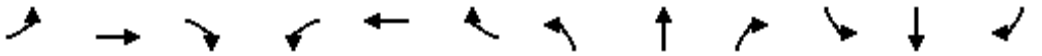
The 2027 sensitivity analysis total traffic volumes shown in Table G-2 were used to prepare an operational analysis at the Beavercreek Road/Meyers Road intersection. The results of the sensitivity analysis are provided in Table G-3.

Table G-3 Year 2027 Total Traffic Conditions, Weekday PM Peak Hour (Sensitivity Analysis for 196 units)

Intersection	Performance Standard	2027 Base Condition	2027 Condition with Site-Added Traffic	Incremental Impact
OR 213/ Meyers Road	0.99	1.13	1.14	+0.01

As shown in Table G-3, the proposed development could increase the number of mid-rise apartments from 141 units to 160 units (for a total of up to 196 units) without having a greater than one percent impact on the operations of the OR 213/Meyers Road intersection upon buildout of the Meyers Road extension, thus not triggering a "significant impact" with up to 196 units.

Additional level-of-service worksheets are provided on the following page in support of the 196-unit analysis shown above.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	275	155	275	50	304	107	175	750	50	312	1750	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		4.0	3.5		3.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1660		1770	1790		1770	1812		1770	3471	1577
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1660		1770	1790		1770	1812		1770	3471	1577
Peak-hour factor, PHF	0.96	0.95	0.96	0.95	0.95	0.95	0.96	0.96	0.95	0.95	0.96	0.96
Adj. Flow (vph)	286	163	286	53	320	113	182	781	53	328	1823	309
RTOR Reduction (vph)	0	47	0	0	9	0	0	2	0	0	0	90
Lane Group Flow (vph)	286	402	0	53	424	0	182	832	0	328	1823	219
Confl. Peds. (#/hr)	4		1				1					1
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%	4%	2%	2%	4%	0%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												2
Actuated Green, G (s)	17.0	39.3		4.0	26.3		10.0	49.2		19.0	58.2	58.2
Effective Green, g (s)	18.0	39.3		4.0	27.3		11.0	51.2		19.0	60.2	60.2
Actuated g/C Ratio	0.14	0.30		0.03	0.21		0.08	0.39		0.15	0.46	0.46
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	2.3		3.0	2.3		2.3	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	245	502		54	376		150	714		259	1607	730
v/s Ratio Prot	c0.16	0.24		0.03	c0.24		0.10	0.46		c0.19	c0.53	
v/s Ratio Perm												0.14
v/c Ratio	1.17	0.80		0.98	1.13		1.21	1.17		1.27	1.13	0.30
Uniform Delay, d1	56.0	41.7		63.0	51.4		59.5	39.4		55.5	34.9	21.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	110.3	8.3		115.3	85.3		142.1	89.3		146.9	68.8	1.1
Delay (s)	166.3	50.1		178.2	136.7		201.6	128.7		202.4	103.7	22.8
Level of Service	F	D		F	F		F	F		F	F	C
Approach Delay (s)		95.3			141.2			141.8			106.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	116.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

EVERGREEN HOUSING
DEVELOPMENT GROUP

July 18, 2013

Caufield Neighborhood Association
Mike Mermelstein – Co-Chair and Land Use Chair – Mike1376@aol.com
Larry Hanlon – Co-Chair – larryhanlon@hotmail.com
Gary Davis – Secretary – Davisgj2@comcast.net

Delivery Via e-mail

RE: Notice of Planned Development at 19896 S Beavercreek Rd, Oregon City, OR

Dear Caufield Neighborhood Association,

This letter is being set to you as Notification of a planned new construction project at 19896 S. Beavercreek Road, as required under section 17.50.055 of the Oregon City Municipal Code. Mike Mermelstein stated that e-mail notification could be used in place of certified mail.

Attached is background on the project concept and some preliminary design of that concept.

Mike Mermelstein and I spoke about the required public meeting and the lack of availability for me to present at your July 23, 2013 meeting. Due to the full schedule of your July 23, 2013 meeting and the lack of other planned meetings until October of this year it was decided that I should set up a separate meeting for the public to listen to our concept, ask questions and provide feedback.

I will send a separate notice about our planned public meeting to all of you and also to the neighbors within 300 feet of our proposed development. I am hoping to have the meeting at the Beavercreek Cooperative Telephone building in mid-August after 6:00pm. I will be in touch with exact details.

If you have any questions in the mean time please contact me via phone or e-mail.

Sincerely,

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
206-535-6248 x 101
andrew@evergreenhd.com

CC: Kattie Riggs – City Liason to the Citizen Involvement Committee – kriggs@orcity.org

EVERGREEN HOUSING
DEVELOPMENT GROUP

July 18, 2013

Caufield Neighborhood Association
Mike Mermelstein – Co-Chair and Land Use Chair – Mike1376@aol.com
Larry Hanlon – Co-Chair – larryhanlon@hotmail.com
Gary Davis – Secretary – Davisgj2@comcast.net

Delivery Via e-mail

RE: Notice of Planned Development at 19896 S Beavercreek Rd, Oregon City, OR

Dear Caufield Neighborhood Association,

This letter is being set to you as Notification of a planned new construction project at 19896 S. Beavercreek Road, as required under section 17.50.055 of the Oregon City Municipal Code. Mike Mermelstein stated that e-mail notification could be used in place of certified mail.

Attached is background on the project concept and some preliminary design of that concept.

Mike Mermelstein and I spoke about the required public meeting and the lack of availability for me to present at your July 23, 2013 meeting. Due to the full schedule of your July 23, 2013 meeting and the lack of other planned meetings until October of this year it was decided that I should set up a separate meeting for the public to listen to our concept, ask questions and provide feedback.

I will send a separate notice about our planned public meeting to all of you and also to the neighbors within 300 feet of our proposed development. I am hoping to have the meeting at the Beavercreek Cooperative Telephone building in mid-August after 6:00pm. I will be in touch with exact details.

If you have any questions in the mean time please contact me via phone or e-mail.

Sincerely,

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
206-535-6248 x 101
andrew@evergreenhd.com

CC: Kattie Riggs – City Liason to the Citizen Involvement Committee – kriggs@orcity.org

19896 S. Beavercreek Road Proposed Development
Community Meeting

August 15, 2013

Clackamas Community College
19600 Molalla Ave
Room 229
Oregon City, OR 97045

Meeting Agenda:

6:15pm Meeting Begins.

- Introduction from Andrew Brand, Director of Development for Evergreen Housing Development Group, LLC
- If size of audience permits, introductions of those in attendance from the community (Please sign in).

6:25pm Project Overview

- General overview of the project including uses, design and project timeline as currently known.

6:40pm Q&A. General discussions *

Meeting Adjourns when Q&A is complete.

*Comments can also be made on the comment sheets available near the sign-in sheet. These can be left anonymously. Or, you can request follow-up.

Additional questions for the developer about this project can be directed to:

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
600 University St, Suite 1708
Seattle, WA 98101
andrew@evergreenhd.com
206-535-6248 x 101

EVERGREEN HOUSING
DEVELOPMENT GROUP

July 18, 2013

Caufield Neighborhood Association
Mike Mermelstein – Co-Chair and Land Use Chair – Mike1376@aol.com
Larry Hanlon – Co-Chair – larryhanlon@hotmail.com
Gary Davis – Secretary – Davisgj2@comcast.net

Delivery Via e-mail

RE: Notice of Planned Development at 19896 S Beavercreek Rd, Oregon City, OR

Dear Caufield Neighborhood Association,

This letter is being set to you as Notification of a planned new construction project at 19896 S. Beavercreek Road, as required under section 17.50.055 of the Oregon City Municipal Code. Mike Mermelstein stated that e-mail notification could be used in place of certified mail.

Attached is background on the project concept and some preliminary design of that concept.

Mike Mermelstein and I spoke about the required public meeting and the lack of availability for me to present at your July 23, 2013 meeting. Due to the full schedule of your July 23, 2013 meeting and the lack of other planned meetings until October of this year it was decided that I should set up a separate meeting for the public to listen to our concept, ask questions and provide feedback.

I will send a separate notice about our planned public meeting to all of you and also to the neighbors within 300 feet of our proposed development. I am hoping to have the meeting at the Beavercreek Cooperative Telephone building in mid-August after 6:00pm. I will be in touch with exact details.

If you have any questions in the mean time please contact me via phone or e-mail.

Sincerely,

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
206-535-6248 x 101
andrew@evergreenhd.com

CC: Kattie Riggs – City Liason to the Citizen Involvement Committee – kriggs@orcity.org

MILBRANDT ARCHITECTS

June 12, 2013

Proposed Development for Beavercreek Road, LLC.

Narrative:

The site plan presented for your consideration today will create the initial focal point for the vibrant and sustainable community to be of Beavercreek. Located at the intersection of Beavercreek Road and Meyers Road our project is likely to be the first community built in the area falling under the yet to be approved Beavercreek Road Concept Plan. Being first comes with both opportunity and responsibility. It is just as crucial to provide desirable, market-supported design solutions for the subject site as it is to consider how the site may inform the future development of the greater community.

Located at 19896 Beavercreek Road, within the Mixed Employment Village, the focus of our study is a 9.59 Acre site to the east of Beavercreek Road that will include an extension of Meyers Road and will serve as one of the main points of entry for this dynamic area to be. This document, and the associated exhibits, will illustrate how the proposed plan is consistent with the objectives of the Beavercreek Road Concept Plan and the Oregon City Municipal Code and Comprehensive Plan. The proposed plan provides a strong foundation needed to ensure the future of the Mixed Employment Village development and surrounding areas.

With the exception of the gas line easement and Meyers Road running through the northwest section, the site is comprised of entirely unconstrained land. What would seem to be a great positive element can in fact at times prove to have the opposite affect; clouding the vision of a design team, causing them to lose the big picture by focusing only on the potential within their own legal boundary lines. Through a careful study of the intents of the applicable codes and concept plans as well as plans previously proposed by others, we are now proposing a plan that we believe will not only meet the goals for our site, but will extend beyond our property lines to influence and provide a positive framework for neighboring developments to plug in to.

CIRCULATION

Before revisiting the building typology, we first need to demonstrate that we will provide a strong plan for circulation in the context of the overall future street network, including all forms of transportation; bicycle, pedestrian, transit and vehicular. The most critical initial transportation plan element is determining the number of through-streets to parallel Beavercreek Road between Beavercreek and the Central Parkway. This will ultimately define block size and developable land areas throughout the Mixed Employment Village and beyond. To consider and inform this issue, we focused on the Oregon City

Municipal Code and Beavercreek Road Concept Plan for direction as well as investigating block sizing at a local, state and national level.

Considering the givens we have to work with, Beavercreek Road as an Arterial Street and Meyers Road as a Collector Street, the first major factor was the minimum street intersection spacing standards outlined in OCMC Chapter 12.04.195. As found in Table 12.04.040, no Local Street or Neighborhood Collector (depending on how the new parallel road will be classified) shall be within 300 feet from Beavercreek Road as measured along Meyers Road. Using this piece of information coupled with an effort to standardize the grid system made the direction rather clear that one parallel road would be the most logical path. With one block dimension defined, further analysis of block sizing was then completed to help inform how many perpendicular cross streets to plan between Meyers Road and Glen Oak Road.

There is, of course, a wide range in block sizes as you sample major metropolitan areas across the country; from one of the largest at 1000'x500' in New York to some of the smallest right here in Portland at only 200'x200'. Delving further into how different block sizes function and the feel they lend to the pedestrian environment is quite informative; and by filtering this information by the types of use and other site specific design parameters we can zero in on an effective range to best suit the goals of the Concept Plan.

After analyzing this information and applying it to our site plan, we feel confident that the 340'x440' block size we have proposed provides the needed balance between maximizing pedestrian circulation routes and reasonably dimensioned net developable land areas. The rationale behind a 340'x440' block size is that the consistent grid spacing it provides will lend flexibility to the different development zones within the Beavercreek Road Concept Plan. In areas such as the Mixed Employment Village Zone, it is just large enough to allow buildings to face onto the streets with the use of alleys and interior parking where a smaller block size would limit the ability to meet this code requirement. As the grid extends to the north to the North Employment Campus, it will lend itself to larger building footprints for commercial and business tenants. Connecting to the South in the Main Street and Mixed Use Neighborhoods the same concept as the MEV could be used (building street frontage with interior alleyways and parking concept) with the option to introduce additional local streets creating half-blocks at 220'x340' for the most pedestrian dense shopping districts.

BUILT ENVIRONMENT

Once we establish a suitable public street grid pattern, we are able to then focus in on the requirements of the code as they relate to the built environment. Starting with what will serve as the gateway to the Mixed Employment Village and the greater Beavercreek community, the north corner of the Meyers Road intersection would be home to a three-story mixed-use building with parking and a public open space/plaza element at the corner. The building itself is proposed to include a ground floor sundries-type market with four housing units above. As an alternative to the typical studio unit these units would be comprised of five bedrooms that share a common living/kitchen space; a unique unit type in the area

which would provide a lower cost option to students of the community college or any community resident looking for an affordable single occupant living option. The enhanced pedestrian space located within the existing gasline easement would be dedicated to serve as the first link between the existing community to the southwest and the extensive trail and open space network planned within the Beavercreek Road Concept Plan.

Framing the entrance on the east corner and extending down Beavercreek Road to the southeast are three-story live/work townhome units. By incorporating elements from OCMC Chapter 17.62.055D, these live/work townhomes will achieve an attractive street presence while at the same time providing an enlarged buffer along Beavercreek Road to promote a safer, yet more active employment and pedestrian environment. To further enhance the pedestrian network along Beavercreek Road a pedestrian plaza is planned to break up the building mass and provide connections into the proposed site.

To promote the same kind of employment opportunity and engaging, active, street life along the new interior Local Streets we have planned to meet the standards of the Neighborhood Greenstreet as outlined in the Beavercreek Road Concept Plan; providing lanes dedicated to vehicles, bicycles and sidewalks buffered by parallel parking lanes and plantings. Lining these Local Streets would be three to four story apartment buildings with direct street access to the ground floor live/work units along Streets A and B. Set close to the street, the Apartment buildings along with the proposed park and community center will draw people into the site by creating a vibrant and active internal local street intersection.

The community center would house both leasing and management functions for the community while providing recreation opportunities with a pool and exercise center. To meet the height requirements of the concept plan a second and third floor are planned above the community center that would add an additional four housing units similar to the units at the northeast corner of Meyers road and Beavercreek road (four 5-bedroom units).

We believe that by planning for the good of the greater community, the plan we present here for your consideration today helps establish the strong foundation needed for a thriving employment, street and pedestrian network in the Beavercreek community to be. With further design development, an attractive street presence with hidden parking clusters, incorporating green building and site strategies, will bring this piece of the pedestrian-oriented Mixed Employment Village community as envisioned by the Beavercreek Road Concept Plan to life.

The following is a list of specific items we hope City staff can provide pointed feedback on, in addition to the design considerations above.

1. Please confirm if there are unpublished conditions to the prior zone change of the property or to the un-adopted provisions of the Beaver Creek Road Concept Plan or conditions that have been put in place since the re-zone was adopted.

2. Please provide guidance or specific criteria as to the study parameters of a Transportation Impact Analysis that will need to be conducted (if indeed required by the City) for this project.

3. Please provide guidance or contacts with ODOT who may be in control of decisions regarding requirements for improving Beavercreek Road as part of our project in order for our team to coordinate TIA, design and permit items.

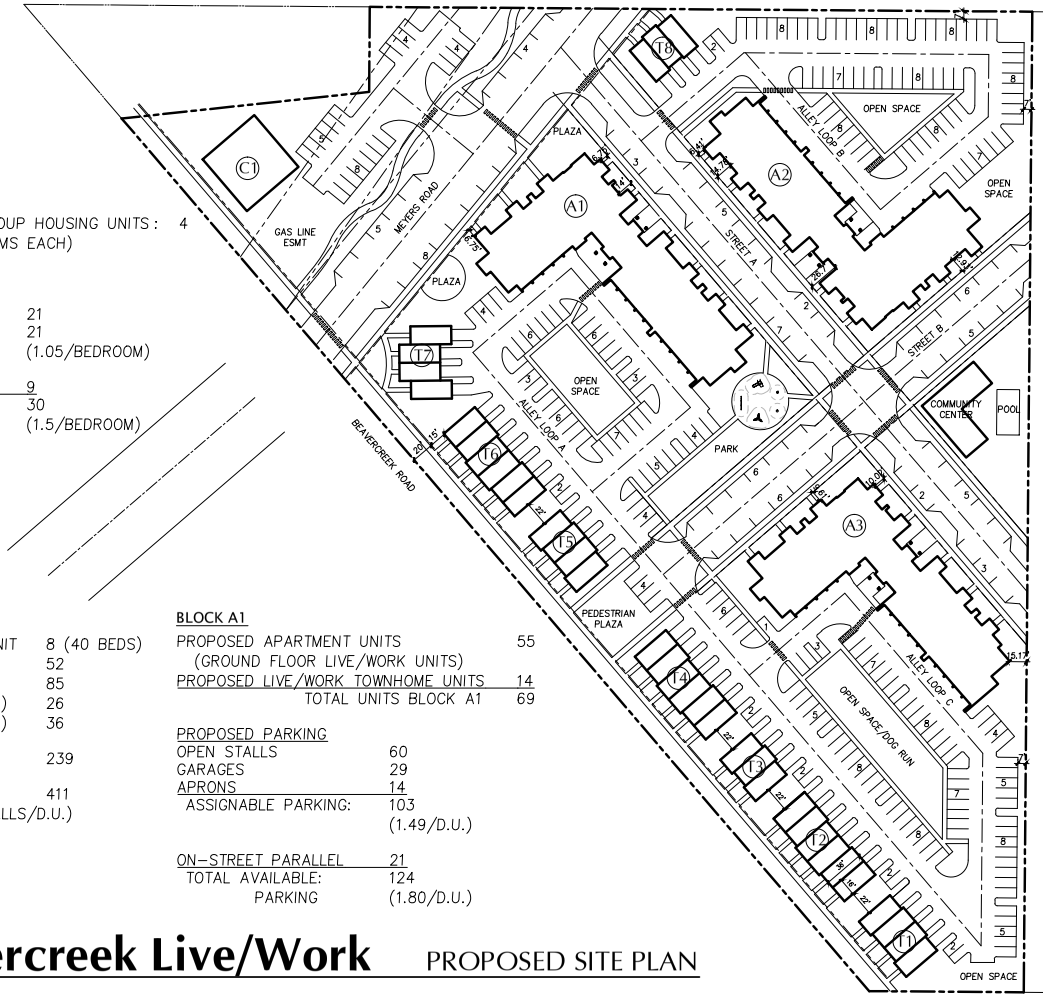
4. Given that much of our project will include streets that will eventually be considered connectors to other parts of the Beavercreek sub-area, please provide any guidance about latecomer fees, SDC credits or public facility dedication SDC credits that may apply to our proposal.

5. As we are new to working with Oregon City we would appreciate pointed feedback about the process and steps for permitting this project, including any time periods for public notification, code required public meetings (if any) and appeal timelines.

Sincerely,

Anna P. Thompson

Milbrandt Architects
Project Manager



BLOCK C1

PROPOSED STUDENT/GROUP HOUSING UNITS: 4
(5 RENTABLE BEDROOMS EACH)

PROPOSED PARKING	
OPEN STALLS	21
ASSIGNABLE PARKING:	21
	(1.05/BEDROOM)
ON-STREET PARALLEL	9
TOTAL AVAILABLE:	30
PARKING	(1.5/BEDROOM)

UNIT TYPE

STUDIO/GROUP HOUSING UNIT	8 (40 BEDS)
1 BED/1 BATH	52
2 BED/2 BATH	85
2 BED/2 BATH (LIVE/WORK)	26
3 BED/2 BATH (LIVE/WORK)	36
TOTAL RENTABLE UNITS	239
TOTAL PARKING	411
	(1.72 STALLS/D.U.)

BLOCK A1

PROPOSED APARTMENT UNITS	55
(GROUND FLOOR LIVE/WORK UNITS)	
PROPOSED LIVE/WORK TOWNHOME UNITS	14
TOTAL UNITS BLOCK A1	69

PROPOSED PARKING	
OPEN STALLS	60
GARAGES	29
APRONS	14
ASSIGNABLE PARKING:	103
	(1.49/D.U.)
ON-STREET PARALLEL	21
TOTAL AVAILABLE:	124
PARKING	(1.80/D.U.)

BLOCK A2

PROPOSED APARTMENT UNITS	55
(GROUND FLOOR LIVE/WORK UNITS)	
PROPOSED LIVE/WORK TOWNHOME UNITS	3
TOTAL UNITS BLOCK A1	58

PROPOSED PARKING	
OPEN STALLS	72
GARAGES	18
APRONS	3
ASSIGNABLE PARKING:	93
	(1.60/D.U.)
ON-STREET PARALLEL	13
TOTAL AVAILABLE:	106
PARKING	(1.82/D.U.)

COMMUNITY CENTER

PROPOSED STUDENT/GROUP HOUSING UNITS: 4
(5 RENTABLE BEDROOMS EACH)

ON-STREET PARALLEL	21
TOTAL AVAILABLE:	21
PARKING	(1.05/BEDROOM)

BLOCK A3

PROPOSED APARTMENT UNITS	53
(GROUND FLOOR LIVE/WORK UNITS)	
PROPOSED LIVE/WORK TOWNHOME UNITS	19
TOTAL UNITS BLOCK A1	72

PROPOSED PARKING	
OPEN STALLS	77
GARAGES	34
APRONS	19
ASSIGNABLE PARKING:	130
	(1.80/D.U.)

Beavercreek Live/Work

PROPOSED SITE PLAN

1:100

H:\1239\SITE_PLAN.DWG

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

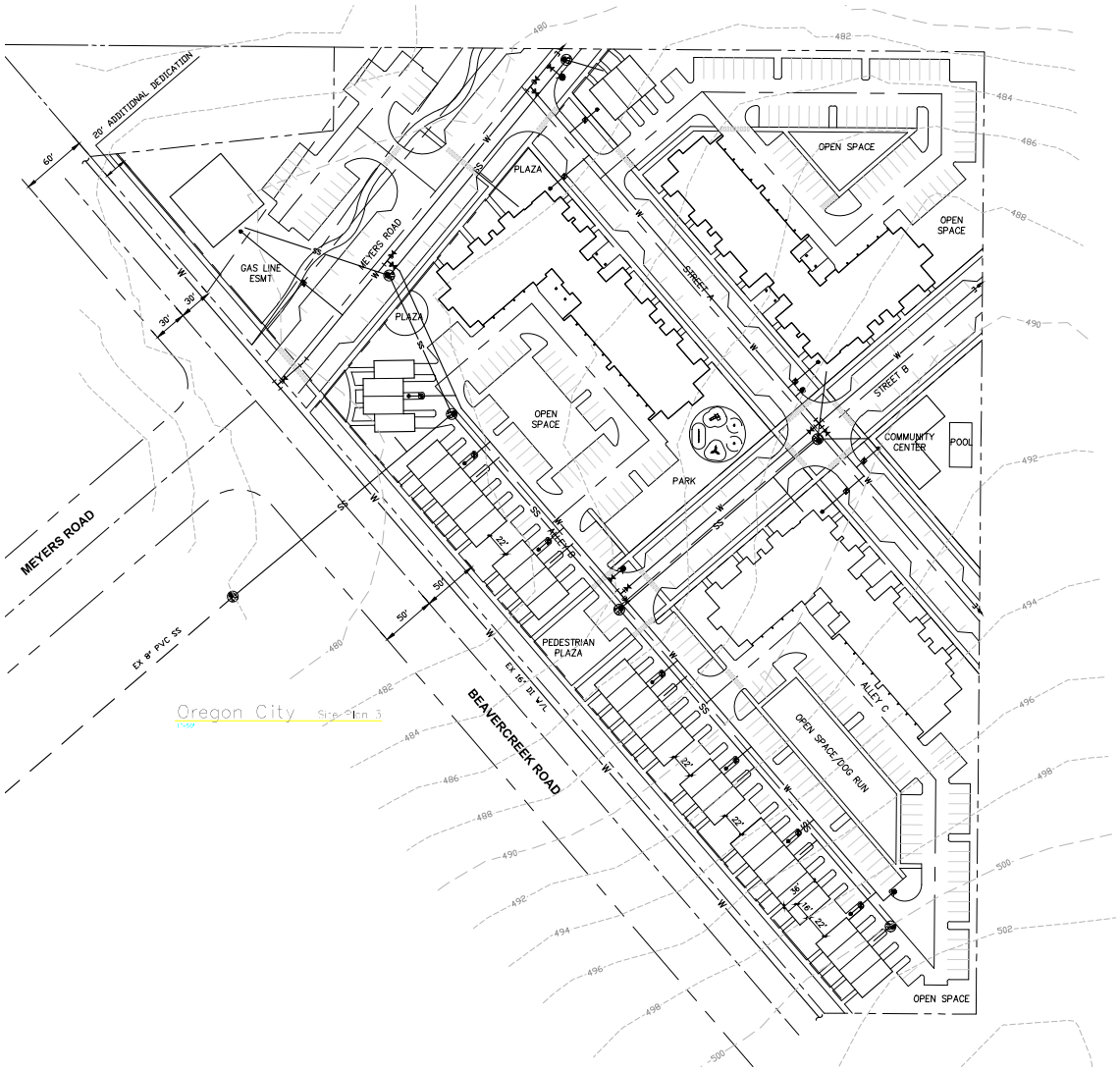
Beavercreek Live/Work
Oregon City, Oregon
Beavercreek Road, LLC

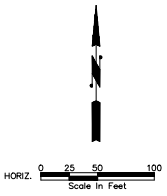
Proposed Site Plan
Live/Work Townhome & Apartment Development

Scale:	Drawn By:	Date:	Date Plotted:
1 : 100	APT	06-10-2013	6-10-13

Sheet No.: **A1**

Job No.: **12-39**





PRELIMINARY

FILE NAME: P:\P12\12815 - MARQUEE DEVELOPMENT CORP. - BEAVER CREEK ROAD\CAD\REF\UTILITY PLAN.DWG
PLOT DATE: 5/24/2013 5:57 PM
PLOT TIME: 5/24/2013 5:57 PM
USER NAME: ANDREW REITER
XREFS:

DESIGNED	AAR				
DRAWN	AAR				
CHECKED	BDL				
SYM	REVISION	DATE	BY	APP'D	

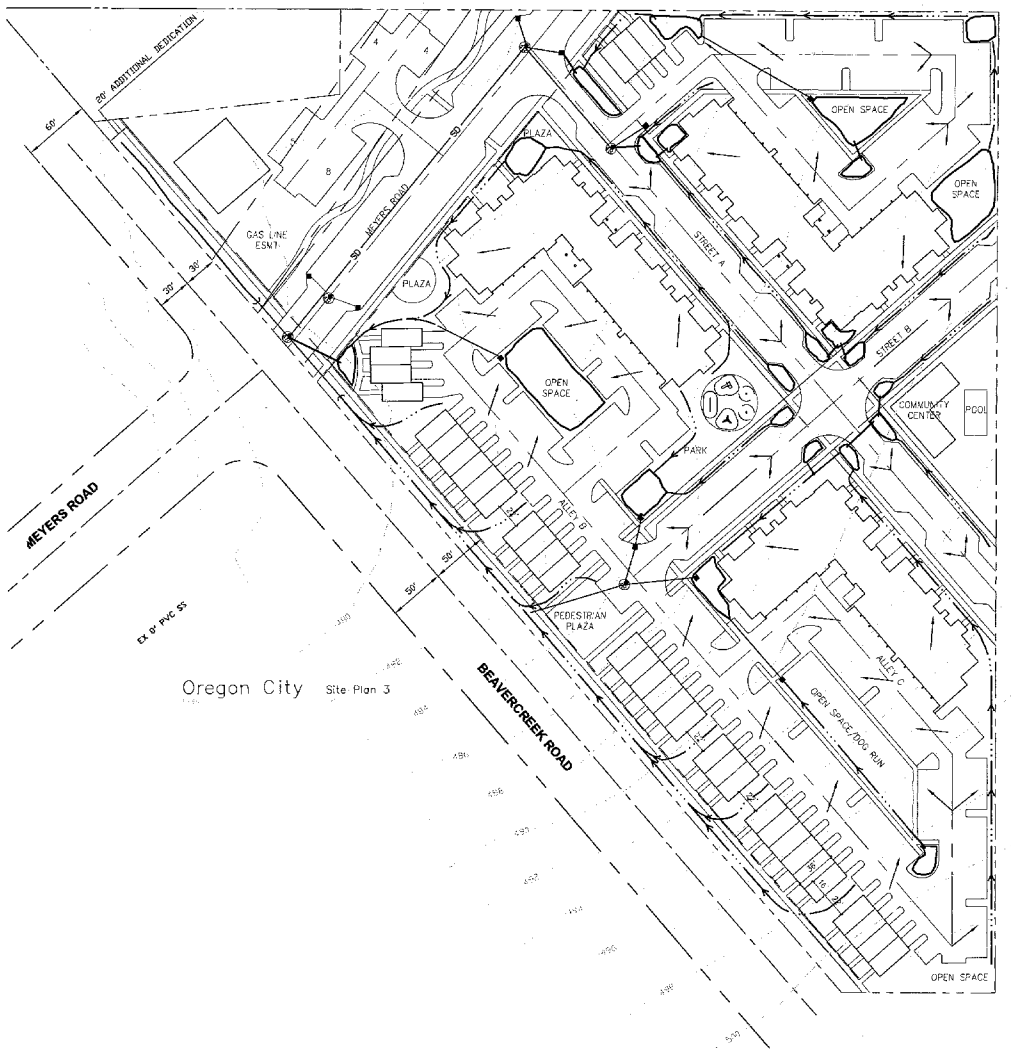
PACE
An Engineering Services Company
5000 Meadows Road, Suite 345
Lake Oswego, OR 97035
p. 503.597.3222 | f. 503.597.7655
Civil | Structural | Planning | Survey
pacenglis.com

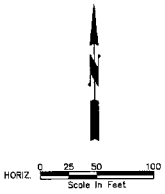
BEAVERCREEK
OREGON CITY, OREGON

PLOT DATE: 5/24/13
SCALE: BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"

UTILITY PLAN

JOB NUMBER 12815
DWG NAME: UTILITY PLAN
SHEET 1 OF 1





####

PRELIMINARY

DESIGNED AAR						
DRAWN AAR						
CHECKED BDL						
SYM	REVISION	DATE	BY	APP'D		

PACE
An Engineering Services Company

6000 Meadows Road, Suite 345
Lake Oswego, OR 97035
p. 503.597.3222 | f. 503.597.7655
Civil | Structural | Planning | Survey
pacenginc.com

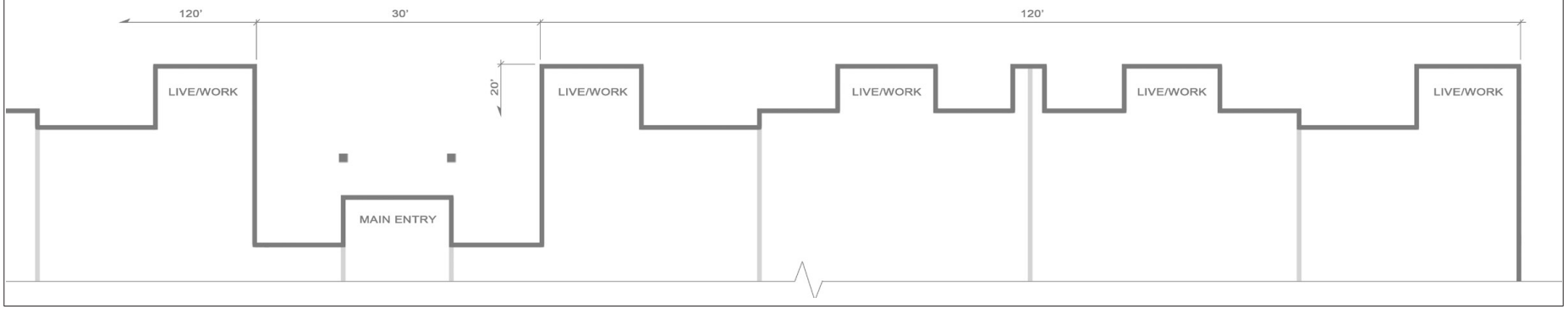
BEAVERCREEK
OREGON CITY, OREGON

PLOT DATE: 5/##/13
SCALE: BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"

STORM DRAINAGE PLAN

JOB NUMBER 12815
DWG NAME: BEAVERCREEK DRAIN
SHEET 1 OF 1

FILE NAME: P:\12\12815 - MARQUEE DEVELOPMENT CORP. - BEAVER CREEK ROAD\CAD\REF\BEAVERCREEK DRAINAGE PLAN.DWG
SAVE TIME: 5/28/2013 4:14:17 PM
PLOT TIME: 5/28/2013 4:14 PM
USER NAME: BRIAN CEE
XREF FILES: ########



Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work

Oregon City, Oregon

Beavercreek Road, LLC

Conceptual Building Elevation

Apartment Building - Scheme A

Scale:	Drawn By:	Date:	Date Plotted:
NTS	APT	06-10-2013	-

Sheet No.: **A4**

Job No.: **12-39**

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work

Oregon City, Oregon

Beavercreek Road, LLC

Conceptual Building Elevation

Apartment Building - Scheme B

Scale:	Drawn By:	Date:	Date Plotted:
NTS	APT	06-10-2013	-

Sheet No.: **A5**

Job No.: **12-39**

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work

Oregon City, Oregon

Beavercreek Road, LLC

Conceptual Building Elevation

Apartment Building - Scheme B

Scale:	Drawn By:	Date:	Date Plotted:
NTS	APT	06-10-2013	-

Sheet No.: **A6**

Job No.: 12-39

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work

Oregon City, Oregon

Beavercreek Road, LLC

Conceptual Building Elevation

Live/Work Townhomes

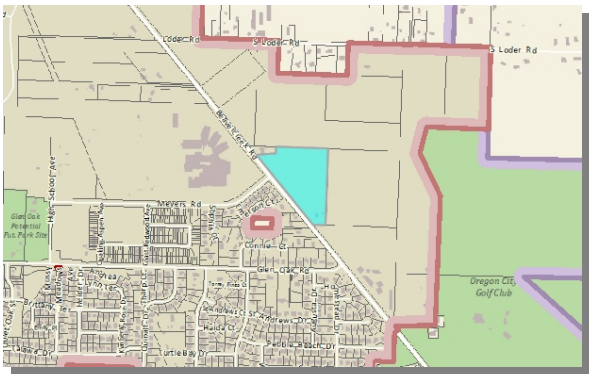
Scale:	Drawn By:	Date:	Date Plotted:
NTS	APT	07-09-2013	-

Sheet No.: **A7**

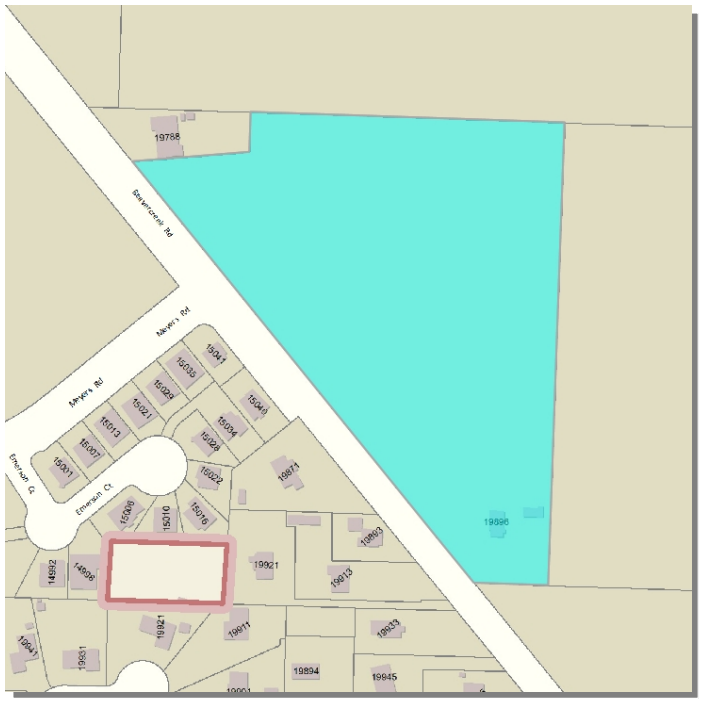
Job No.: **12-39**

Taxlot Detail Report

Taxlot: 3-2E-10C -00800



Overview Map



Taxlot highlighted in blue

Taxlot Information

APN: 3-2E-10C -00800
Alt ID: 00870711
Site Address: 19896 BEAVERCREEK RD
OREGON CITY, OR 97045
Year Built: 1945

Taxpayer Information

Taxpayer: *Suppressed*
Address: *Suppressed*

Reference Information

Parcel Area (acres - approx): 9.7
Parcel Area (sq. ft. - approx): 423,403
Twn/Rng/Sec: 03S 02E 10
Tax Map Reference: 32E10C

Values

Mkt Values as of: 10/10/2012
Land Value (Mkt): $800,000
Building Value (Mkt): $1,500
Exempt Amount: $0
Net Value (Mkt): $801,500
Note: These are Market, NOT Assessed values.
Assessed Value: $224,097

Planning Designations

Zoning: MUC1
- Mixed Use Corridor District

Comprehensive Plan: muc
- Mixed Use - Corridor

Subdivision: NONE
PUD (if known):
Neighborhood Assn: Caufield NA
Urban Renewal District:
Historic District:
Historic Designated Structure? N
In Willamette Greenway? N
In Geologic Hazard? N
In Nat. Res. Overlay District (NROD)? N
In 1996 Floodplain? N

Report generated 5/14/2013 9:35 AM

City of Oregon City
PO Box 3040
625 Center St
Oregon City, OR 97045
(503) 657-0891
www.orcity.org

EVERGREEN HOUSING
DEVELOPMENT GROUP

July 29, 2013

Caufield Neighborhood Association
Via – email

NOTICE OF PUBLIC MEETING TO DISCUSS A NEW DEVELOPMENT PROPOSAL AT 19896 S. BEAVERCREEK ROAD.

Dear Neighbor,

I'm writing to invite you to a public meeting in room #229 of McLaughlin Hall on the Clackamas Community College campus on August 15, 2013 at 6:15 pm.

19600 Molalla Ave
McLaughlin Hall
Room 229
Oregon City, OR 97045

This meeting is for you to learn about a new 239-unit market rate multi-family development proposed for the 9.59-acre vacant parcel located at 19896 S. Beavercreek Road in Oregon City. At this meeting you will have the opportunity to learn more about this proposed development, ask questions and provide comments.

Sincerely,

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC

Subject: Re: Notice of New Development Proposal
Date: Friday, July 19, 2013 10:34:15 AM Pacific Daylight Time
From: Gary K Davis
To: Andrew Brand

I am in receipt of your proposed development for 19896 S Beavercreek Road.
Gary Davis

From: "Andrew Brand" <andrew@evergreenhd.com>
To: Mike1376@aol.com, larryhanlon@hotmail.com, Davisgj2@comcast.net
Cc: "Kattie Riggs" <kriggs@ci.oregon-city.or.us>
Sent: Friday, July 19, 2013 10:18:26 AM
Subject: Notice of New Development Proposal

Mike, Larry and Gary,

Attached is a PDF with Notification and background information on a new development we are proposing and exploring at 19896 S Beavercreek Road.

The attached information should answer a number of your questions but I suspect there will be much more to discuss. I will send out a separate notice about a meeting time and place.

Please confirm receipt of this e-mail and the attachment. It is a 5.8MB file. I want to ensure that it reaches you.

Sincerely,

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
600 University St, Suite 1708
Seattle, WA 98101
206-535-6248 x 101
andrew@evergreenhd.com

Subject: RE: Notice of New Development Proposal
Date: Friday, July 26, 2013 11:04:56 AM Pacific Daylight Time
From: Larry Hanlon
To: Andrew Brand
CC: davisgj2@comcast.net, mike1376@aol.com

Good Morning Andrew, Yes I recd your Notice and we reviewed it at our neighborhood meeting. Mike will be in touch with you. Larry

---

From: andrew@evergreenhd.com
To: Mike1376@aol.com; larryhanlon@hotmail.com; Davisgj2@comcast.net
CC: kriggs@ci.oregon-city.or.us
Subject: Notice of New Development Proposal
Date: Fri, 19 Jul 2013 17:18:26 +0000

Mike, Larry and Gary,

Attached is a PDF with Notification and background information on a new development we are proposing and exploring at 19896 S Beavercreek Road.

The attached information should answer a number of your questions but I suspect there will be much more to discuss. I will send out a separate notice about a meeting time and place.

Please confirm receipt of this e-mail and the attachment. It is a 5.8MB file. I want to ensure that it reaches you.

Sincerely,

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
600 University St, Suite 1708
Seattle, WA 98101
206-535-6248 x 101
andrew@evergreenhd.com

19896 Beavercreek Road Development Concept Meeting

SIGN IN SHEET

August 15, 2013

	NAME	ADDRESS	PHONE	E-MAIL
1	Jason Oppeland	15016 Emerson Ct	503-317-8408	froshove@yahoo.com
2	Valerie Cay	9943 SE Linwood Milwauk	503 477 3398	cay.valerie@yahoo
3	Barbara Broadbent	19288 Beavercreek Rd	503-518-7754	
4	Thomas Broadbent	19288 Beavercreek Rd	503-518-7754	journalwriter23@hotmail.com
5	Wendy Carter	15035 Emerson	503-515-8300	wshfish@aol.com
6	Matthew Johnson	15844 S. Leland Rd	503.632.7754	N/A
7	Wayne & LaVerne Bauer	19921 Connie Ct	503-655-7361	
8	Mike & Judy Fernandez	15028 Emerson Ct	503-578-2450	
9	Jeff Wiedemann	15022 Emerson Ct	503-515-9958	jeffreydw@gmail.com
10	Gary Davis	20102 Kimberly Rose Oc	503-387-5400	davisgj2@comcast.net

19896 Beavercreek Road
August 15, 2013
Neighborhood Meeting

Comment Sheet for the Developer's Files

Please write your comments or questions about the project below. If you would like a follow-up to you question please include a phone number or e-mail where we can reach you.

Canfield Neighborhood Association concerns:

1) Impact on overcrowded schools.
2) Traffic flow excesses on Beavercreek Rd.
3) Parking spilling out onto streets
4) Heights of apartments going to four stories.
5) Lack of dedicated storefront areas on ground level.
6) Water pressure concerns
7) Adequate spaces in roadway for school buses
8) Consistency with future development of Beavercreek Plan

19896 Beavercreek Road
August 15, 2013
Neighborhood Meeting

Comment Sheet for the Developer's Files

Please write your comments or questions about the project below. If you would like a follow-up to you question please include a phone number or e-mail where we can reach you.

- Traffic - During school hours, Traffic is already tight. How do you plan to ~~rectify this?~~ Address this?
- How do you plan to address the additional parking needs?
- Traffic is our biggest concern, with the High school during hours of use we need to be able to access our house.
- With the addition of college "housing" we who live close to the ~~the~~ New units are concerned with the possibility of additional crime -
- we are also Concerned about our Property Values declining further.
-

Valerie Cay
503 477 3398
Cay.Valerie@yahoo.com

19896 Beavercreek Road
August 15, 2013
Neighborhood Meeting

Comment Sheet for the Developer's Files

Please write your comments or questions about the project below. If you would like a follow-up to you question please include a phone number or e-mail where we can reach you.

- Community Garden by house on N side rent Garden plots. Would add to community and would make home owner happy to maintain privacy and sense of not being built on top of
- Not 4 Stories please!
- RMS is a horrible management Company I Suggest not using them
- Aliance Testing Services in Troutdale is good for Aggregate testing (concrete asphalt) :)
- Please make higher end to keep area nice no low income/sec 8
- Not a play grand on the N side by house

19896 Beavercreek Road
August 15, 2013
Neighborhood Meeting

Comment Sheet for the Developer's Files

Please write your comments or questions about the project below. If you would like a follow-up to you question please include a phone number or e-mail where we can reach you.

- Will this negatively impact water/water pressure in the area?
- Congestion w/traffic is largest concern -
- Impact on schools - will they build a new school or add on to Beavercreek?
- Will there be any noise abatement? The traffic noise is already too much on Beavercreek!

Fun fact - You do know there are coyotes on that land!?!

19896 Beavercreek Road
August 15, 2013
Neighborhood Meeting

Comment Sheet for the Developer's Files

Please write your comments or questions about the project below. If you would like a follow-up to you question please include a phone number or e-mail where we can reach you.

Wish these could be townhomes or rowhouses SOLD not rented

Concerned about apartments with 4-5 college kids per unit

Very concerned about increased traffic - How long will turn lane be so Beavercreek does not back up with turn lane over flow

Wendy Carter wshfish@aol.com

EVERGREEN HOUSING
DEVELOPMENT GROUP

19896 S. Beavercreek Road Proposed Development
Community Meeting

August 15, 2013

Clackamas Community College
19600 Molalla Ave
Room 229
Oregon City, OR 97045

Meeting Agenda:

6:15pm Meeting Begins.

- Introduction from Andrew Brand, Director of Development for Evergreen Housing Development Group, LLC
- If size of audience permits, introductions of those in attendance from the community (Please sign in).

6:25pm Project Overview

- General overview of the project including uses, design and project timeline as currently known.

6:40pm Q&A. General discussions *

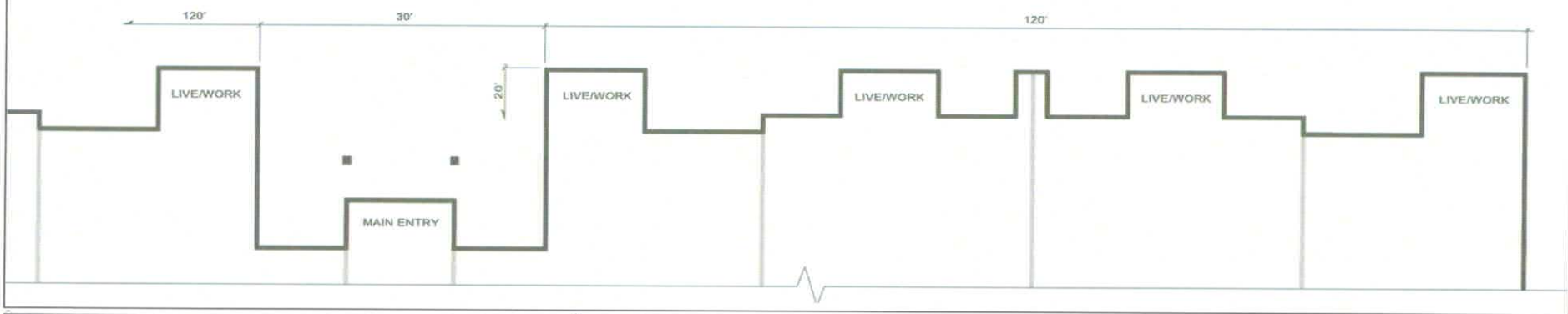
Meeting Adjourns when Q&A is complete.

*Comments can also be made on the comment sheets available near the sign-in sheet. These can be left anonymously. Or, you can request follow-up.

Additional questions for the developer about this project can be directed to:

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
600 University St, Suite 1708
Seattle, WA 98101
andrew@evergreenhd.com
206-535-6248 x 101


Community College
High School
Proposed Development Site
S Thayer Rd
Marjorie Ln
213
Google earth
© 2013 Google
N



presented at meeting but not a hand-out

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work
Oregon City, Oregon
Beavercreek Road, LLC

Conceptual Building Elevation
Apartment Building - Scheme A

Scale:	Drawn By:	Date:	Date Plotted:
NTS	APT	06-10-2013	-

Sheet No.: **A4**
Job No.: 12-39

Presented at meeting but not a hand-out

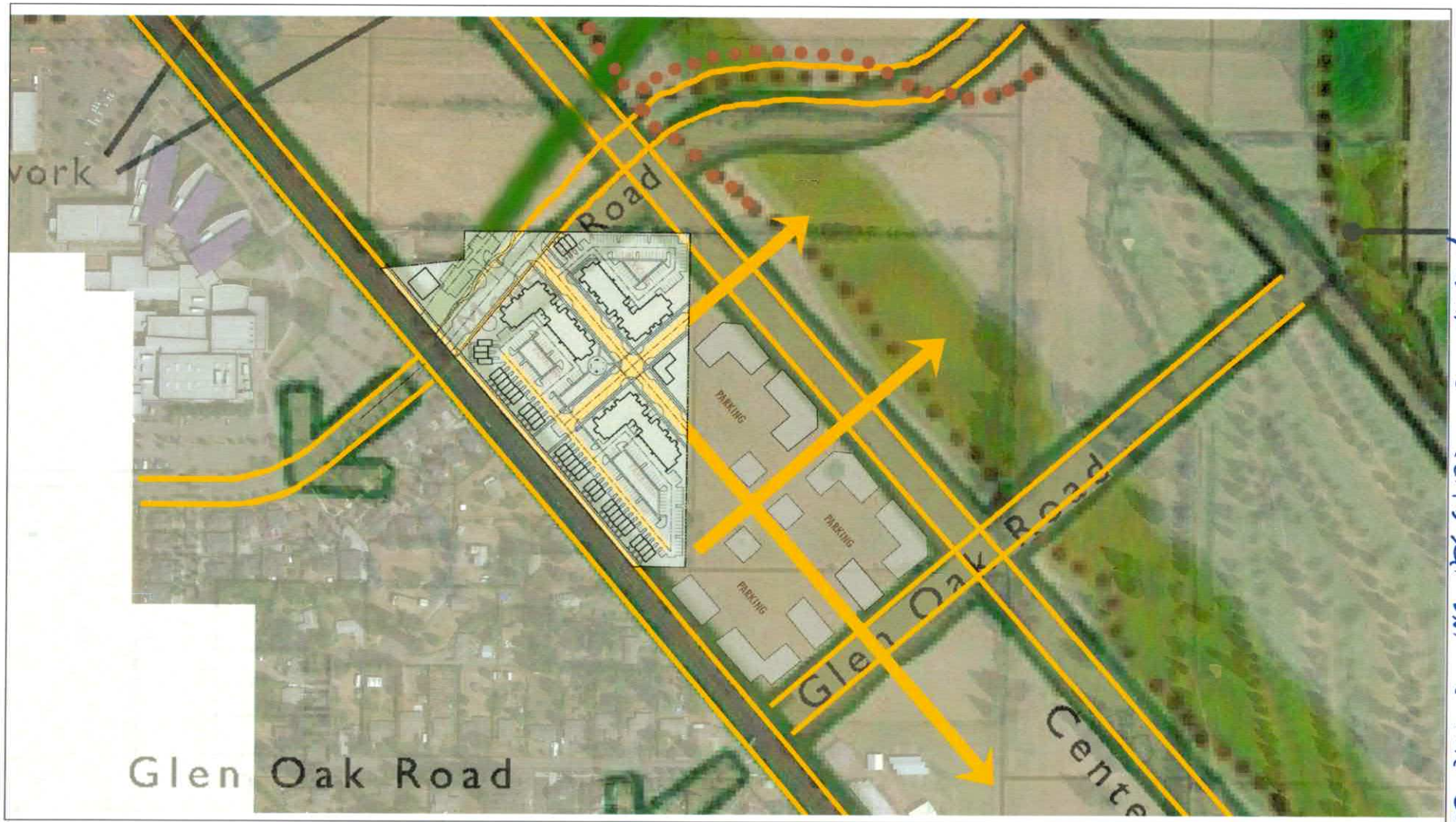
Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work
Oregon City, Oregon
Beavercreek Road, LLC

Conceptual Building Elevation
Apartment Building - Scheme B

Scale	Drawn By	Date	Date Plotted
NTS	APT	06-10-2013	-

Sheet No.: **A5**
Job No.: 12-39



presented at meeting but not a hand-out.

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work
Oregon City, Oregon
Beavercreek Road, LLC

Conceptual Building Elevation
Apartment Building - Scheme B

Scale:	Drawn by:	Date:	Date Plotted:
NTS	APT	06-10-2013	-

Sheet No.: A6
Job No.: 12-39

Subject: Re: 19896 Beavercreek Road Community Meeting Notes
Date: Friday, August 16, 2013 10:26:03 PM Pacific Daylight Time
From: mike1376@aol.com
To: Andrew Brand

I am responding as requested that I received the email regarding 19896 Beavercreek Road in Oregon City.

Unfortunately I was unable to attend the meeting. I cannot support the project because it is creating high density populations around the Oregon City High School and Clackamas College.

Mike Mermelstein
Co-Chairman Caufield Neighborhood Association

Sent from my iPhone

On Aug 16, 2013, at 4:08 PM, Andrew Brand <andrew@evergreenhd.com> wrote:

> Kattie,
> Attached is a PDF with the sign-in sheet, comment sheets and agenda with presentation materials from the community meeting we held on the evening of August 15th at the Clackamas Community College for our proposed development at 19896 Beavercreek Road.
> Gary Davis from the Caufield Neighborhood Association was able to attend. Larry and Mike, the co-chairs were not in attendance due to other conflicts.
> Gary Davis summarized the concerns of the Neighborhood Association on the comment sheet headed "Caufield Neighborhood Association Concerns:".
> I recognize all these concerns and will remain aware of them as we finalize our concept for the site in anticipation of our project permit submissions. Share this information with anyone from the City you think should be made aware of these notes.
> Finally, please confirm receipt of this e-mail and the attached PDF and let me know if you need any additional information.
> Sincerely,
> Andrew Brand
> Director of Development
> Evergreen Housing Development Group, LLC
> 600 University St, Suite 1708
> Seattle, WA 98101
> 206-535-6248 x 101
> andrew@evergreenhd.com
> <Meeting Sign-in Comments and Materials 130815.pdf>

Subject: Re: Notice of New Development Proposal
Date: Friday, July 19, 2013 10:34:15 AM Pacific Daylight Time
From: Gary K Davis
To: Andrew Brand

I am in receipt of your proposed development for 19896 S Beavercreek Road.
Gary Davis

From: "Andrew Brand" <andrew@evergreenhd.com>
To: Mike1376@aol.com, larryhanlon@hotmail.com, Davisgj2@comcast.net
Cc: "Kattie Riggs" <kriggs@ci.oregon-city.or.us>
Sent: Friday, July 19, 2013 10:18:26 AM
Subject: Notice of New Development Proposal

Mike, Larry and Gary,

Attached is a PDF with Notification and background information on a new development we are proposing and exploring at 19896 S Beavercreek Road.

The attached information should answer a number of your questions but I suspect there will be much more to discuss. I will send out a separate notice about a meeting time and place.

Please confirm receipt of this e-mail and the attachment. It is a 5.8MB file. I want to ensure that it reaches you.

Sincerely,

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
600 University St, Suite 1708
Seattle, WA 98101
206-535-6248 x 101
andrew@evergreenhd.com

Subject: RE: Notice of New Development Proposal
Date: Friday, July 26, 2013 11:04:56 AM Pacific Daylight Time
From: Larry Hanlon
To: Andrew Brand
CC: davisgj2@comcast.net, mike1376@aol.com

Good Morning Andrew, Yes I recd your Notice and we reviewed it at our neighborhood meeting. Mike will be in touch with you. Larry

---

From: andrew@evergreenhd.com
To: Mike1376@aol.com; larryhanlon@hotmail.com; Davisgj2@comcast.net
CC: kriggs@ci.oregon-city.or.us
Subject: Notice of New Development Proposal
Date: Fri, 19 Jul 2013 17:18:26 +0000

Mike, Larry and Gary,

Attached is a PDF with Notification and background information on a new development we are proposing and exploring at 19896 S Beavercreek Road.

The attached information should answer a number of your questions but I suspect there will be much more to discuss. I will send out a separate notice about a meeting time and place.

Please confirm receipt of this e-mail and the attachment. It is a 5.8MB file. I want to ensure that it reaches you.

Sincerely,

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
600 University St, Suite 1708
Seattle, WA 98101
206-535-6248 x 101
andrew@evergreenhd.com

19896 S. Beavercreek Road Proposed Development
Community Meeting

August 15, 2013

Clackamas Community College
19600 Molalla Ave
Room 229
Oregon City, OR 97045

Meeting Agenda:

6:15pm Meeting Begins.

- Introduction from Andrew Brand, Director of Development for Evergreen Housing Development Group, LLC
- If size of audience permits, introductions of those in attendance from the community (Please sign in).

6:25pm Project Overview

- General overview of the project including uses, design and project timeline as currently known.

6:40pm Q&A. General discussions *

Meeting Adjourns when Q&A is complete.

*Comments can also be made on the comment sheets available near the sign-in sheet. These can be left anonymously. Or, you can request follow-up.

Additional questions for the developer about this project can be directed to:

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
600 University St, Suite 1708
Seattle, WA 98101
andrew@evergreenhd.com
206-535-6248 x 101

19896 Beavercreek Road Development Concept Meeting

SIGN IN SHEET

August 15, 2013

	NAME	ADDRESS	PHONE	E-MAIL
1	Jason Oppeland	15016 Emerson Ct	503-317-8408	froshove@yahoo.com
2	Valerie Cay	9943 SE Linwood Milwauk	503 477 3398	cay.valerie@yahoo
3	Barbara Broadbent	19288 Beavercreek Rd	503-518-7754	
4	Thomas Broadbent	19288 Beavercreek Rd	503-518-7754	journalwriter23@hotmail.com
5	Wendy Carter	15035 Emerson	503-515-8300	wshfish@aol.com
6	Matthew Johnson	15844 S. Leland Rd	503.632.7754	N/A
7	Wayne & LaVerne Bauer	19921 Connie Ct	503-655-7361	
8	Mike & Judy Fernandez	15028 Emerson Ct	503-578-2450	
9	Jeff Wiedemann	15022 Emerson Ct	503-515-9958	jeffreydw@gmail.com
10	Gary Davis	20102 Kimberly Rose Oc	503-387-5400	davisgj2@comcast.net

19896 Beavercreek Road
August 15, 2013
Neighborhood Meeting

Comment Sheet for the Developer's Files

Please write your comments or questions about the project below. If you would like a follow-up to you question please include a phone number or e-mail where we can reach you.

Canfield Neighborhood Association concerns:

1) Impact on overcrowded schools.
2) Traffic flow excesses on Beavercreek Rd.
3) Parking spilling out onto streets
4) Heights of apartments going to four stories.
5) Lack of dedicated storefront areas on ground level.
6) Water pressure concerns
7) Adequate spaces in roadway for school buses
8) Consistency with future development of Beavercreek Plan

19896 Beavercreek Road
August 15, 2013
Neighborhood Meeting

Comment Sheet for the Developer's Files

Please write your comments or questions about the project below. If you would like a follow-up to you question please include a phone number or e-mail where we can reach you.

- Traffic - During school hours, Traffic is already tight. How do you plan to ~~rectify this?~~ Address this?
- How do you plan to address the additional parking needs?
- Traffic is our biggest concern, with the High school during hours of use we need to be able to access our house.
- With the addition of college "housing" we who live close to the ~~the~~ New units are concerned with the possibility of additional crime -
- we are also Concerned about our Property Values declining further.
-

Valerie Cay
503 477 3398
Cay.Valerie@yahoo.com

19896 Beavercreek Road
August 15, 2013
Neighborhood Meeting

Comment Sheet for the Developer's Files

Please write your comments or questions about the project below. If you would like a follow-up to you question please include a phone number or e-mail where we can reach you.

- Community Garden by house on N side rent Garden plots. Would add to community and would make home owner happy to maintain privacy and sense of not being built on top of
- Not 4 Stories please!
- RMS is a horrible management Company I Suggest not using them
- Aliance Testing Services in Troutdale is good for Aggregate testing (concrete asphalt) :)
- Please make higher end to keep area nice no low income/sec 8
- Not a play grand on the N side by house

19896 Beavercreek Road
August 15, 2013
Neighborhood Meeting

Comment Sheet for the Developer's Files

Please write your comments or questions about the project below. If you would like a follow-up to you question please include a phone number or e-mail where we can reach you.

- Will this negatively impact water/water pressure in the area?
- Congestion w/traffic is largest concern -
- Impact on schools - will they build a new school or add on to Beavercreek?
- Will there be any noise abatement? The traffic noise is already too much on Beavercreek!

Fun fact - You do know there are coyotes on that land!?!

19896 Beavercreek Road
August 15, 2013
Neighborhood Meeting

Comment Sheet for the Developer's Files

Please write your comments or questions about the project below. If you would like a follow-up to you question please include a phone number or e-mail where we can reach you.

Wish these could be townhomes or rowhouses SOLD not rented

Concerned about apartments with 4-5 college kids per unit

Very concerned about increased traffic - How long will turn lane be so Beavercreek does not back up with turn lane over flow

Wendy Carter wshfish@aol.com

EVERGREEN HOUSING
DEVELOPMENT GROUP

19896 S. Beavercreek Road Proposed Development
Community Meeting

August 15, 2013

Clackamas Community College
19600 Molalla Ave
Room 229
Oregon City, OR 97045

Meeting Agenda:

6:15pm Meeting Begins.

- Introduction from Andrew Brand, Director of Development for Evergreen Housing Development Group, LLC
- If size of audience permits, introductions of those in attendance from the community (Please sign in).

6:25pm Project Overview

- General overview of the project including uses, design and project timeline as currently known.

6:40pm Q&A. General discussions *

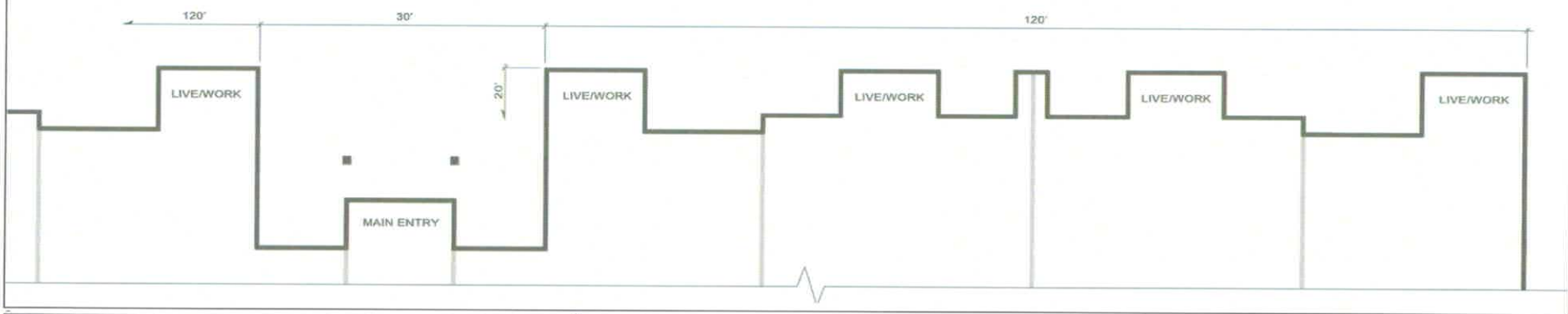
Meeting Adjourns when Q&A is complete.

*Comments can also be made on the comment sheets available near the sign-in sheet. These can be left anonymously. Or, you can request follow-up.

Additional questions for the developer about this project can be directed to:

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
600 University St, Suite 1708
Seattle, WA 98101
andrew@evergreenhd.com
206-535-6248 x 101


Community College
High School
Proposed Development Site
S Thayer Rd
Marjorie Ln
213
Google earth
© 2013 Google
N



presented at meeting but not a hand-out

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work
Oregon City, Oregon
Beavercreek Road, LLC

Conceptual Building Elevation
Apartment Building - Scheme A

Scale:	Drawn By:	Date:	Date Plotted:
NTS	APT	06-10-2013	-

Sheet No.: **A4**
Job No.: 12-39

Presented at meeting but not a hand-out

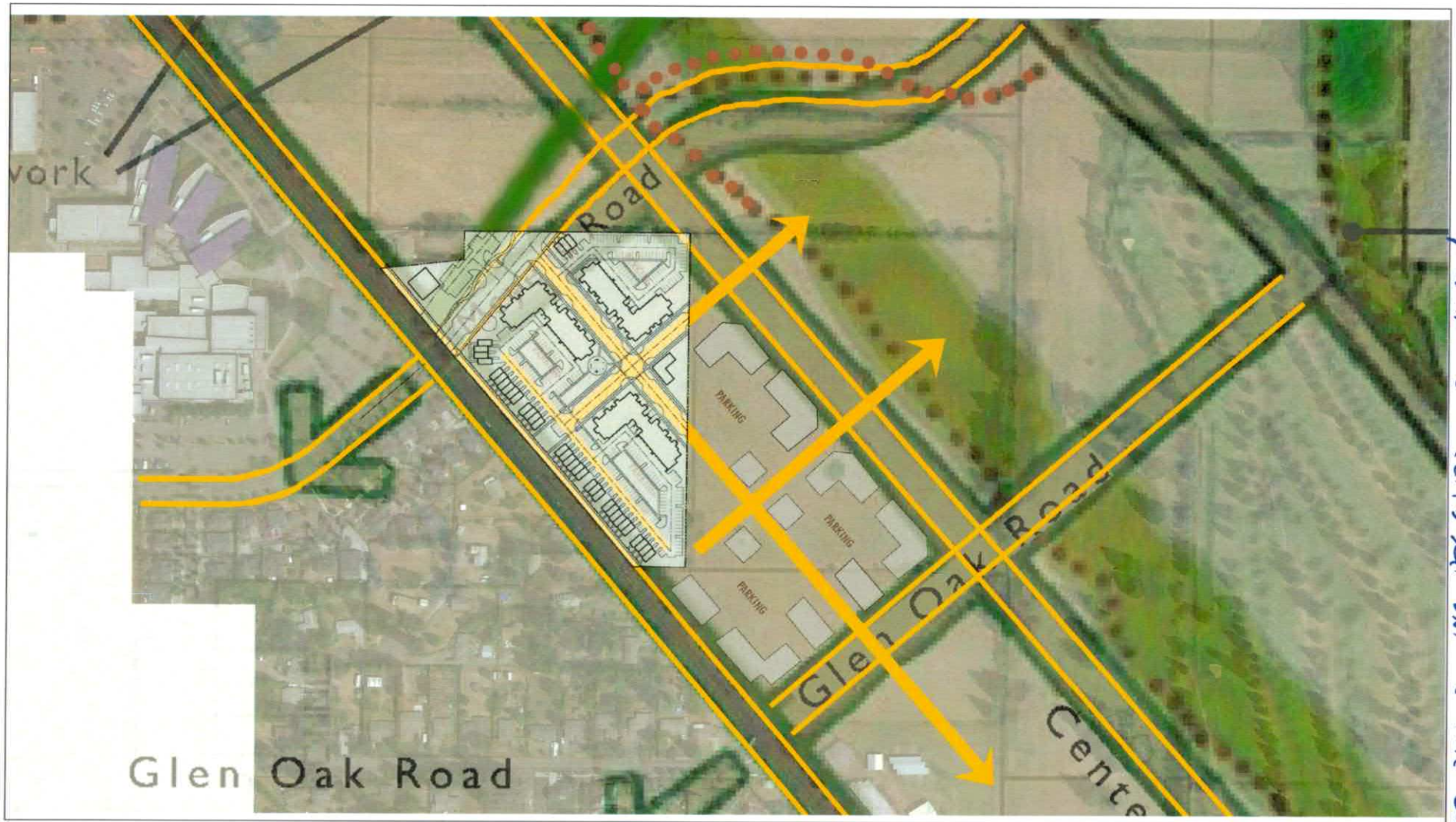
Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work
Oregon City, Oregon
Beavercreek Road, LLC

Conceptual Building Elevation
Apartment Building - Scheme B

Scale	Drawn By	Date	Date Plotted
NTS	APT	06-10-2013	-

Sheet No.: **A5**
Job No.: 12-39



presented at meeting but not a hand-out.

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work
Oregon City, Oregon
Beavercreek Road, LLC

Conceptual Building Elevation
Apartment Building - Scheme B

Scale:	Drawn by:	Date:	Date Plotted:
NTS	APT	06-10-2013	-

Sheet No.: A6
Job No.: 12-39

Subject: Re: 19896 Beavercreek Road Community Meeting Notes
Date: Friday, August 16, 2013 10:26:03 PM Pacific Daylight Time
From: mike1376@aol.com
To: Andrew Brand

I am responding as requested that I received the email regarding 19896 Beavercreek Road in Oregon City.

Unfortunately I was unable to attend the meeting. I cannot support the project because it is creating high density populations around the Oregon City High School and Clackamas College.

Mike Mermelstein
Co-Chairman Caufield Neighborhood Association

Sent from my iPhone

On Aug 16, 2013, at 4:08 PM, Andrew Brand <andrew@evergreenhd.com> wrote:

> Kattie,
> Attached is a PDF with the sign-in sheet, comment sheets and agenda with presentation materials from the community meeting we held on the evening of August 15th at the Clackamas Community College for our proposed development at 19896 Beavercreek Road.
> Gary Davis from the Caufield Neighborhood Association was able to attend. Larry and Mike, the co-chairs were not in attendance due to other conflicts.
> Gary Davis summarized the concerns of the Neighborhood Association on the comment sheet headed "Caufield Neighborhood Association Concerns:".
> I recognize all these concerns and will remain aware of them as we finalize our concept for the site in anticipation of our project permit submissions. Share this information with anyone from the City you think should be made aware of these notes.
> Finally, please confirm receipt of this e-mail and the attached PDF and let me know if you need any additional information.
> Sincerely,
> Andrew Brand
> Director of Development
> Evergreen Housing Development Group, LLC
> 600 University St, Suite 1708
> Seattle, WA 98101
> 206-535-6248 x 101
> andrew@evergreenhd.com
> <Meeting Sign-in Comments and Materials 130815.pdf>

EVERGREEN HOUSING
DEVELOPMENT GROUP

July 29, 2013

Caufield Neighborhood Association
Via – email

NOTICE OF PUBLIC MEETING TO DISCUSS A NEW DEVELOPMENT PROPOSAL AT 19896 S. BEAVERCREEK ROAD.

Dear Neighbor,

I'm writing to invite you to a public meeting in room #229 of McLaughlin Hall on the Clackamas Community College campus on August 15, 2013 at 6:15 pm.

19600 Molalla Ave
McLaughlin Hall
Room 229
Oregon City, OR 97045

This meeting is for you to learn about a new 239-unit market rate multi-family development proposed for the 9.59-acre vacant parcel located at 19896 S. Beavercreek Road in Oregon City. At this meeting you will have the opportunity to learn more about this proposed development, ask questions and provide comments.

Sincerely,

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC

EVERGREEN HOUSING
DEVELOPMENT GROUP

July 18, 2013

Caufield Neighborhood Association
Mike Mermelstein – Co-Chair and Land Use Chair – Mike1376@aol.com
Larry Hanlon – Co-Chair – larryhanlon@hotmail.com
Gary Davis – Secretary – Davisgj2@comcast.net

Delivery Via e-mail

RE: Notice of Planned Development at 19896 S Beavercreek Rd, Oregon City, OR

Dear Caufield Neighborhood Association,

This letter is being set to you as Notification of a planned new construction project at 19896 S. Beavercreek Road, as required under section 17.50.055 of the Oregon City Municipal Code. Mike Mermelstein stated that e-mail notification could be used in place of certified mail.

Attached is background on the project concept and some preliminary design of that concept.

Mike Mermelstein and I spoke about the required public meeting and the lack of availability for me to present at your July 23, 2013 meeting. Due to the full schedule of your July 23, 2013 meeting and the lack of other planned meetings until October of this year it was decided that I should set up a separate meeting for the public to listen to our concept, ask questions and provide feedback.

I will send a separate notice about our planned public meeting to all of you and also to the neighbors within 300 feet of our proposed development. I am hoping to have the meeting at the Beavercreek Cooperative Telephone building in mid-August after 6:00pm. I will be in touch with exact details.

If you have any questions in the mean time please contact me via phone or e-mail.

Sincerely,

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
206-535-6248 x 101
andrew@evergreenhd.com

CC: Kattie Riggs – City Liason to the Citizen Involvement Committee – kriggs@orcity.org

MILBRANDT ARCHITECTS

June 12, 2013

Proposed Development for Beavercreek Road, LLC.

Narrative:

The site plan presented for your consideration today will create the initial focal point for the vibrant and sustainable community to be of Beavercreek. Located at the intersection of Beavercreek Road and Meyers Road our project is likely to be the first community built in the area falling under the yet to be approved Beavercreek Road Concept Plan. Being first comes with both opportunity and responsibility. It is just as crucial to provide desirable, market-supported design solutions for the subject site as it is to consider how the site may inform the future development of the greater community.

Located at 19896 Beavercreek Road, within the Mixed Employment Village, the focus of our study is a 9.59 Acre site to the east of Beavercreek Road that will include an extension of Meyers Road and will serve as one of the main points of entry for this dynamic area to be. This document, and the associated exhibits, will illustrate how the proposed plan is consistent with the objectives of the Beavercreek Road Concept Plan and the Oregon City Municipal Code and Comprehensive Plan. The proposed plan provides a strong foundation needed to ensure the future of the Mixed Employment Village development and surrounding areas.

With the exception of the gas line easement and Meyers Road running through the northwest section, the site is comprised of entirely unconstrained land. What would seem to be a great positive element can in fact at times prove to have the opposite affect; clouding the vision of a design team, causing them to lose the big picture by focusing only on the potential within their own legal boundary lines. Through a careful study of the intents of the applicable codes and concept plans as well as plans previously proposed by others, we are now proposing a plan that we believe will not only meet the goals for our site, but will extend beyond our property lines to influence and provide a positive framework for neighboring developments to plug in to.

CIRCULATION

Before revisiting the building typology, we first need to demonstrate that we will provide a strong plan for circulation in the context of the overall future street network, including all forms of transportation; bicycle, pedestrian, transit and vehicular. The most critical initial transportation plan element is determining the number of through-streets to parallel Beavercreek Road between Beavercreek and the Central Parkway. This will ultimately define block size and developable land areas throughout the Mixed Employment Village and beyond. To consider and inform this issue, we focused on the Oregon City

Municipal Code and Beavercreek Road Concept Plan for direction as well as investigating block sizing at a local, state and national level.

Considering the givens we have to work with, Beavercreek Road as an Arterial Street and Meyers Road as a Collector Street, the first major factor was the minimum street intersection spacing standards outlined in OCMC Chapter 12.04.195. As found in Table 12.04.040, no Local Street or Neighborhood Collector (depending on how the new parallel road will be classified) shall be within 300 feet from Beavercreek Road as measured along Meyers Road. Using this piece of information coupled with an effort to standardize the grid system made the direction rather clear that one parallel road would be the most logical path. With one block dimension defined, further analysis of block sizing was then completed to help inform how many perpendicular cross streets to plan between Meyers Road and Glen Oak Road.

There is, of course, a wide range in block sizes as you sample major metropolitan areas across the country; from one of the largest at 1000'x500' in New York to some of the smallest right here in Portland at only 200'x200'. Delving further into how different block sizes function and the feel they lend to the pedestrian environment is quite informative; and by filtering this information by the types of use and other site specific design parameters we can zero in on an effective range to best suit the goals of the Concept Plan.

After analyzing this information and applying it to our site plan, we feel confident that the 340'x440' block size we have proposed provides the needed balance between maximizing pedestrian circulation routes and reasonably dimensioned net developable land areas. The rationale behind a 340'x440' block size is that the consistent grid spacing it provides will lend flexibility to the different development zones within the Beavercreek Road Concept Plan. In areas such as the Mixed Employment Village Zone, it is just large enough to allow buildings to face onto the streets with the use of alleys and interior parking where a smaller block size would limit the ability to meet this code requirement. As the grid extends to the north to the North Employment Campus, it will lend itself to larger building footprints for commercial and business tenants. Connecting to the South in the Main Street and Mixed Use Neighborhoods the same concept as the MEV could be used (building street frontage with interior alleyways and parking concept) with the option to introduce additional local streets creating half-blocks at 220'x340' for the most pedestrian dense shopping districts.

BUILT ENVIRONMENT

Once we establish a suitable public street grid pattern, we are able to then focus in on the requirements of the code as they relate to the built environment. Starting with what will serve as the gateway to the Mixed Employment Village and the greater Beavercreek community, the north corner of the Meyers Road intersection would be home to a three-story mixed-use building with parking and a public open space/plaza element at the corner. The building itself is proposed to include a ground floor sundries-type market with four housing units above. As an alternative to the typical studio unit these units would be comprised of five bedrooms that share a common living/kitchen space; a unique unit type in the area

which would provide a lower cost option to students of the community college or any community resident looking for an affordable single occupant living option. The enhanced pedestrian space located within the existing gasline easement would be dedicated to serve as the first link between the existing community to the southwest and the extensive trail and open space network planned within the Beavercreek Road Concept Plan.

Framing the entrance on the east corner and extending down Beavercreek Road to the southeast are three-story live/work townhome units. By incorporating elements from OCMC Chapter 17.62.055D, these live/work townhomes will achieve an attractive street presence while at the same time providing an enlarged buffer along Beavercreek Road to promote a safer, yet more active employment and pedestrian environment. To further enhance the pedestrian network along Beavercreek Road a pedestrian plaza is planned to break up the building mass and provide connections into the proposed site.

To promote the same kind of employment opportunity and engaging, active, street life along the new interior Local Streets we have planned to meet the standards of the Neighborhood Greenstreet as outlined in the Beavercreek Road Concept Plan; providing lanes dedicated to vehicles, bicycles and sidewalks buffered by parallel parking lanes and plantings. Lining these Local Streets would be three to four story apartment buildings with direct street access to the ground floor live/work units along Streets A and B. Set close to the street, the Apartment buildings along with the proposed park and community center will draw people into the site by creating a vibrant and active internal local street intersection.

The community center would house both leasing and management functions for the community while providing recreation opportunities with a pool and exercise center. To meet the height requirements of the concept plan a second and third floor are planned above the community center that would add an additional four housing units similar to the units at the northeast corner of Meyers road and Beavercreek road (four 5-bedroom units).

We believe that by planning for the good of the greater community, the plan we present here for your consideration today helps establish the strong foundation needed for a thriving employment, street and pedestrian network in the Beavercreek community to be. With further design development, an attractive street presence with hidden parking clusters, incorporating green building and site strategies, will bring this piece of the pedestrian-oriented Mixed Employment Village community as envisioned by the Beavercreek Road Concept Plan to life.

The following is a list of specific items we hope City staff can provide pointed feedback on, in addition to the design considerations above.

1. Please confirm if there are unpublished conditions to the prior zone change of the property or to the un-adopted provisions of the Beaver Creek Road Concept Plan or conditions that have been put in place since the re-zone was adopted.

2. Please provide guidance or specific criteria as to the study parameters of a Transportation Impact Analysis that will need to be conducted (if indeed required by the City) for this project.

3. Please provide guidance or contacts with ODOT who may be in control of decisions regarding requirements for improving Beavercreek Road as part of our project in order for our team to coordinate TIA, design and permit items.

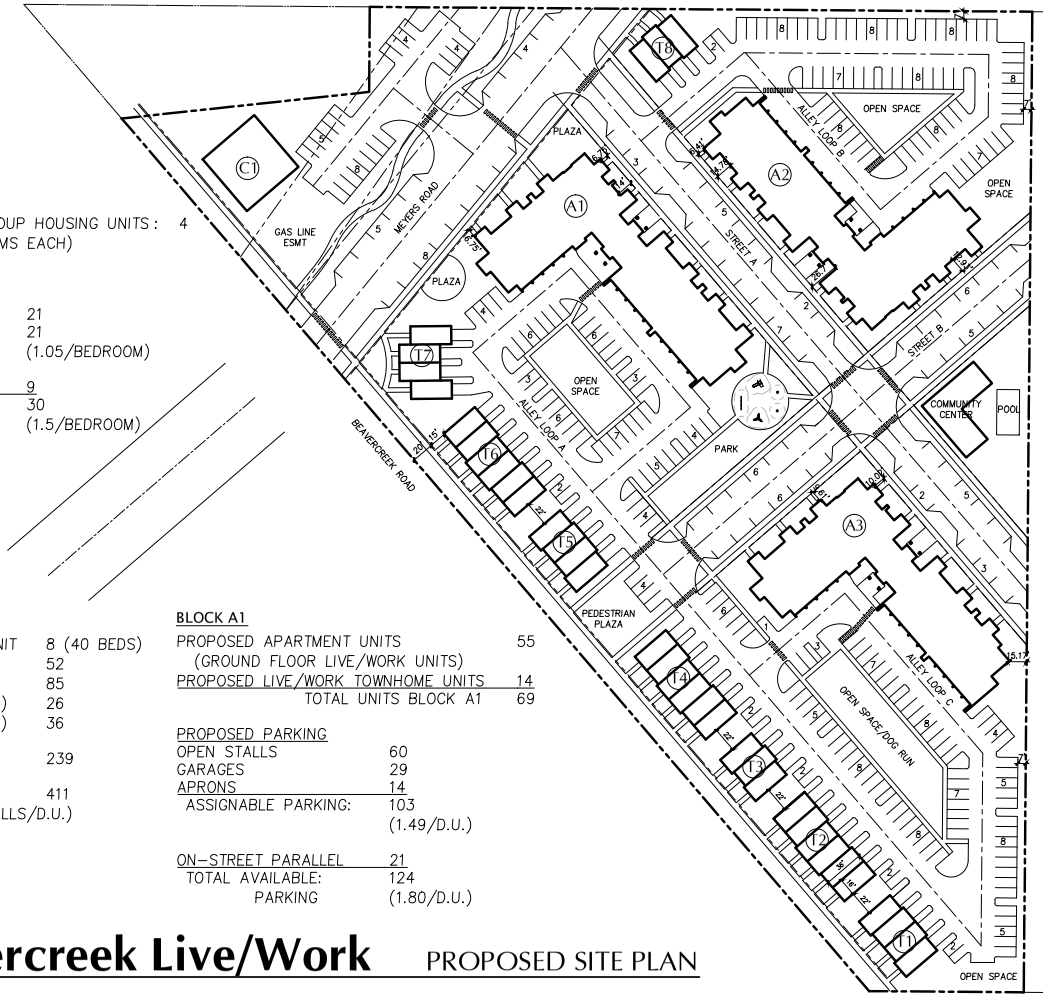
4. Given that much of our project will include streets that will eventually be considered connectors to other parts of the Beavercreek sub-area, please provide any guidance about latecomer fees, SDC credits or public facility dedication SDC credits that may apply to our proposal.

5. As we are new to working with Oregon City we would appreciate pointed feedback about the process and steps for permitting this project, including any time periods for public notification, code required public meetings (if any) and appeal timelines.

Sincerely,

Anna P. Thompson

Milbrandt Architects
Project Manager



BLOCK C1

PROPOSED STUDENT/GROUP HOUSING UNITS: 4
(5 RENTABLE BEDROOMS EACH)

PROPOSED PARKING	
OPEN STALLS	21
ASSIGNABLE PARKING:	21
	(1.05/BEDROOM)
ON-STREET PARALLEL	9
TOTAL AVAILABLE:	30
PARKING	(1.5/BEDROOM)

UNIT TYPE

STUDIO/GROUP HOUSING UNIT	8 (40 BEDS)
1 BED/1 BATH	52
2 BED/2 BATH	85
2 BED/2 BATH (LIVE/WORK)	26
3 BED/2 BATH (LIVE/WORK)	36
TOTAL RENTABLE UNITS	239
TOTAL PARKING	411
	(1.72 STALLS/D.U.)

BLOCK A1

PROPOSED APARTMENT UNITS	55
(GROUND FLOOR LIVE/WORK UNITS)	
PROPOSED LIVE/WORK TOWNHOME UNITS	14
TOTAL UNITS BLOCK A1	69

PROPOSED PARKING	
OPEN STALLS	60
GARAGES	29
APRONS	14
ASSIGNABLE PARKING:	103
	(1.49/D.U.)
ON-STREET PARALLEL	21
TOTAL AVAILABLE:	124
PARKING	(1.80/D.U.)

BLOCK A2

PROPOSED APARTMENT UNITS	55
(GROUND FLOOR LIVE/WORK UNITS)	
PROPOSED LIVE/WORK TOWNHOME UNITS	3
TOTAL UNITS BLOCK A1	58

PROPOSED PARKING	
OPEN STALLS	72
GARAGES	18
APRONS	3
ASSIGNABLE PARKING:	93
	(1.60/D.U.)
ON-STREET PARALLEL	13
TOTAL AVAILABLE:	106
PARKING	(1.82/D.U.)

COMMUNITY CENTER

PROPOSED STUDENT/GROUP HOUSING UNITS: 4
(5 RENTABLE BEDROOMS EACH)

ON-STREET PARALLEL	21
TOTAL AVAILABLE:	21
PARKING	(1.05/BEDROOM)

BLOCK A3

PROPOSED APARTMENT UNITS	53
(GROUND FLOOR LIVE/WORK UNITS)	
PROPOSED LIVE/WORK TOWNHOME UNITS	19
TOTAL UNITS BLOCK A1	72

PROPOSED PARKING	
OPEN STALLS	77
GARAGES	34
APRONS	19
ASSIGNABLE PARKING:	130
	(1.80/D.U.)

Beavercreek Live/Work

PROPOSED SITE PLAN

1:100

H:\1239\SITE_PLAN.DWG

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

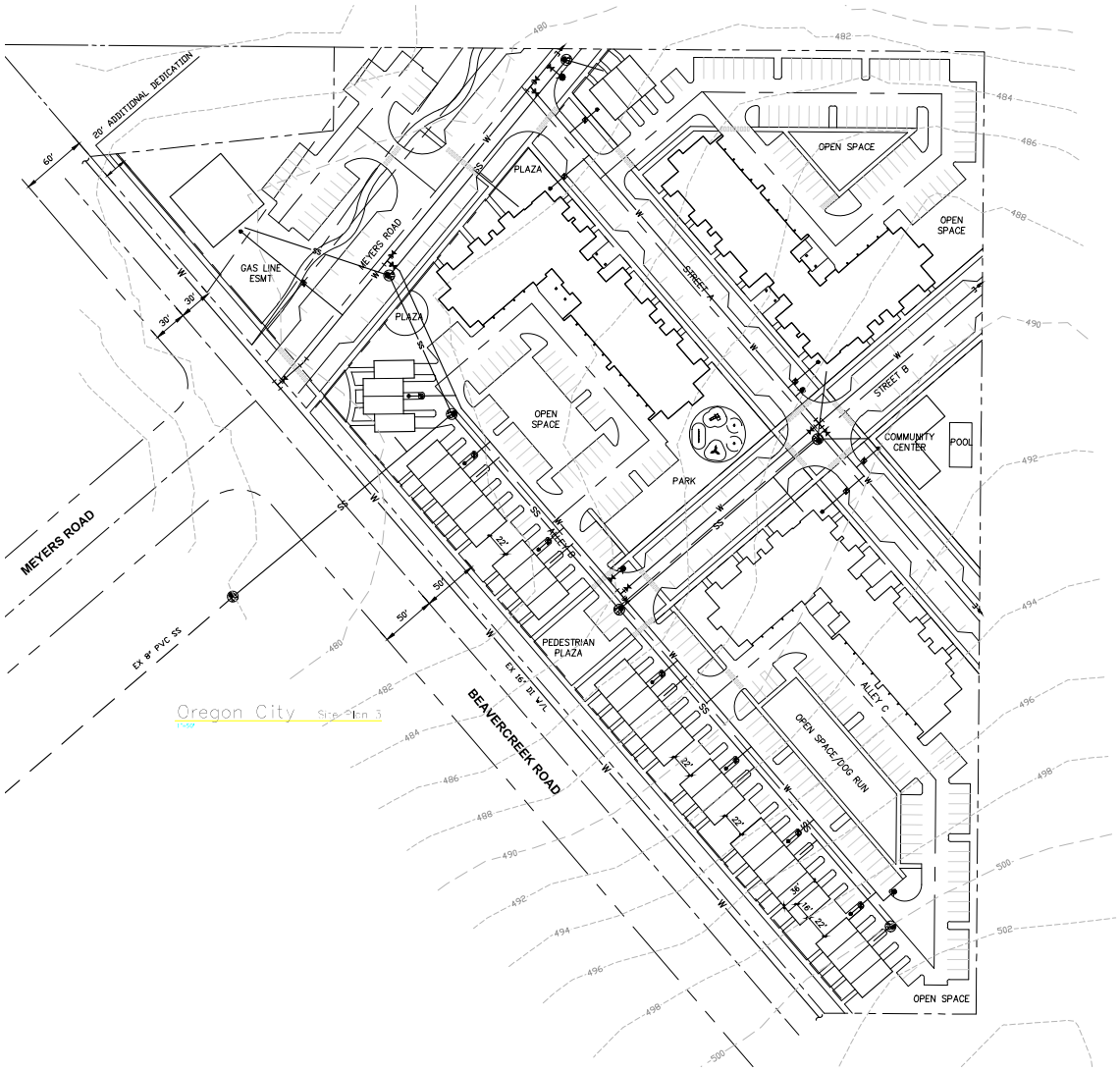
Beavercreek Live/Work
Oregon City, Oregon
Beavercreek Road, LLC

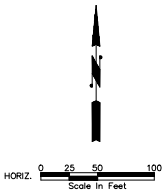
Proposed Site Plan
Live/Work Townhome & Apartment Development

Scale:	Drawn By:	Date:	Date Plotted:
1 : 100	APT	06-10-2013	6-10-13

Sheet No.: **A1**

Job No.: **12-39**





PRELIMINARY

FILE NAME: P:\P12\12815 - MARQUEE DEVELOPMENT CORP. - BEAVER CREEK ROAD\CAD\REF\UTILITY PLAN.DWG
PLOT DATE: 5/24/2013 5:57 PM
PLOT TIME: 5/24/2013 5:57 PM
USER NAME: ANDREW REITER
XREFS:

DESIGNED	AAR				
DRAWN	AAR				
CHECKED	BDL				
SYM	REVISION	DATE	BY	APP'D	

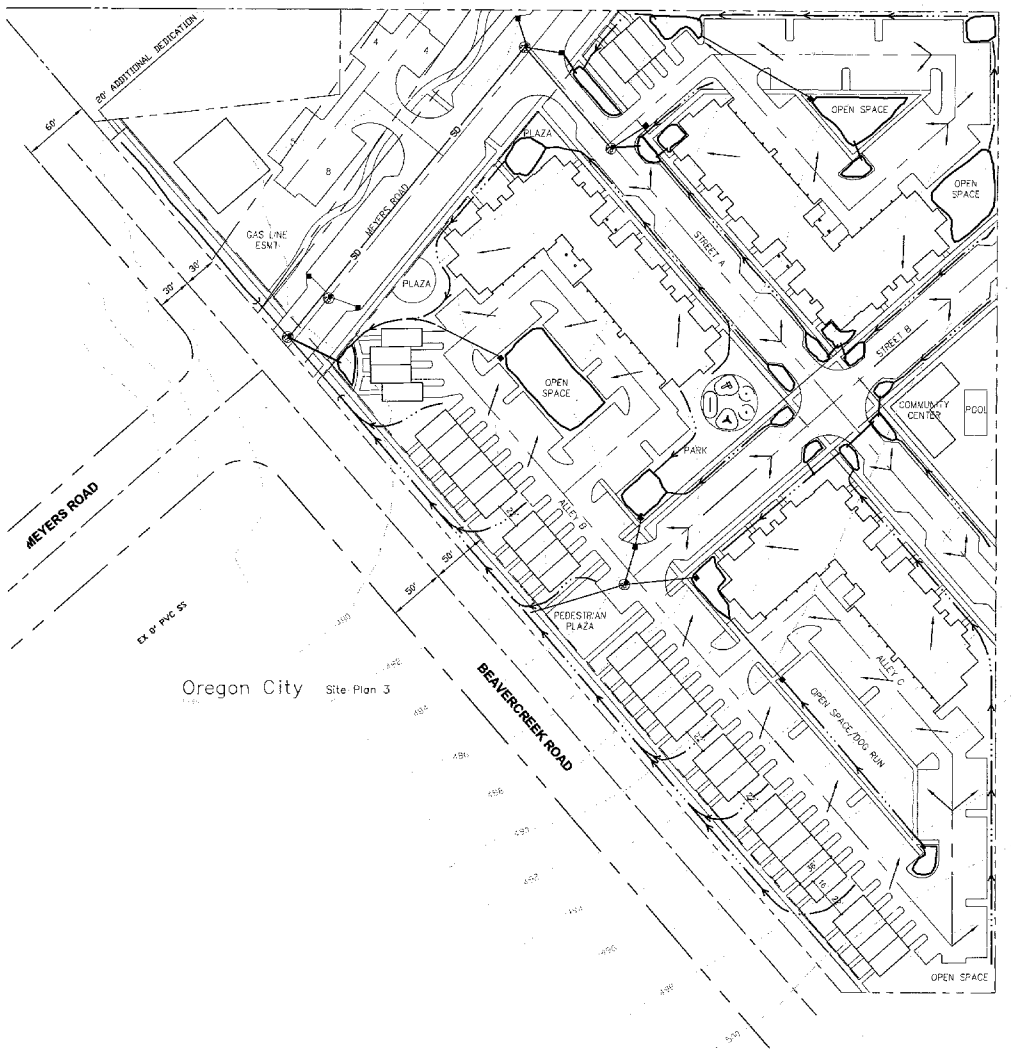
PACE
An Engineering Services Company
5000 Meadows Road, Suite 345
Lake Oswego, OR 97035
p. 503.597.3222 | f. 503.597.7655
Civil | Structural | Planning | Survey
pacenglis.com

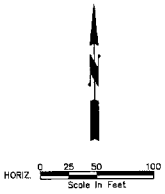
BEAVERCREEK
OREGON CITY, OREGON

PLOT DATE: 5/24/13
SCALE: BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"

UTILITY PLAN

JOB NUMBER 12815
DWG NAME: UTILITY PLAN
SHEET 1 OF 1





####

PRELIMINARY

DESIGNED AAR						
DRAWN AAR						
CHECKED BDL						
SYM	REVISION	DATE	BY	APP'D		

PACE
An Engineering Services Company

6000 Meadows Road, Suite 345
Lake Oswego, OR 97035
p. 503.597.3222 | f. 503.597.7655
Civil | Structural | Planning | Survey
pacenginc.com

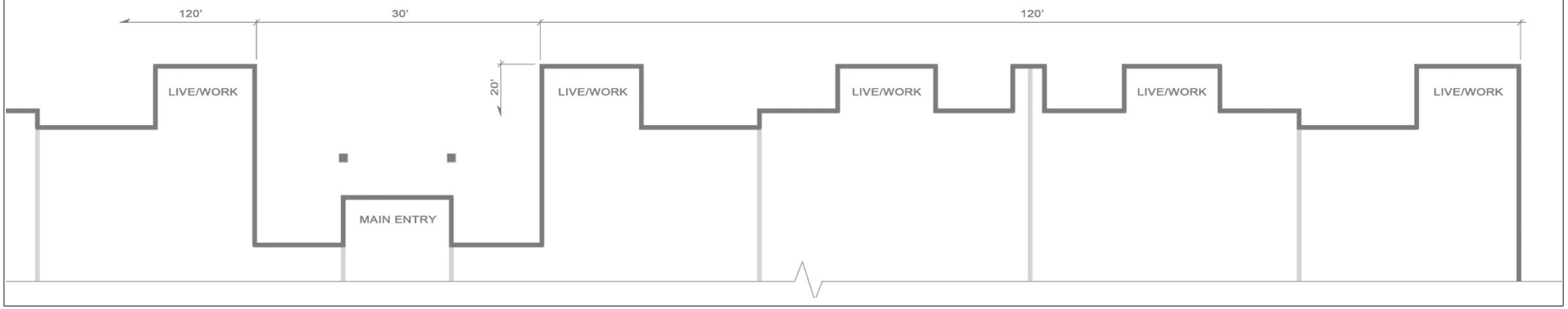
BEAVERCREEK
OREGON CITY, OREGON

PLOT DATE: 5/##/13
SCALE: BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"

STORM DRAINAGE PLAN

JOB NUMBER 12815
DWG NAME: BEAVERCREEK DRAIN
SHEET 1 OF 1

FILE NAME: P:\12\12815 - MARQUEE DEVELOPMENT CORP. - BEAVER CREEK ROAD\CAD\REF\BEAVERCREEK DRAINAGE PLAN.DWG
SAVE TIME: 5/28/2013 4:14:17 PM
PLOT TIME: 5/28/2013 4:14 PM
USER NAME: BRIAN CEE
XREF FILES: ########



Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work

Oregon City, Oregon

Beavercreek Road, LLC

Conceptual Building Elevation

Apartment Building - Scheme A

Scale:	Drawn By:	Date:	Date Plotted:
NTS	APT	06-10-2013	-

Sheet No.: **A4**

Job No.: **12-39**

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work

Oregon City, Oregon

Beavercreek Road, LLC

Conceptual Building Elevation

Apartment Building - Scheme B

Scale:	Drawn By:	Date:	Date Plotted:
NTS	APT	06-10-2013	-

Sheet No.: **A5**

Job No.: **12-39**

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work

Oregon City, Oregon

Beavercreek Road, LLC

Conceptual Building Elevation

Apartment Building - Scheme B

Scale:	Drawn By:	Date:	Date Plotted:
NTS	APT	06-10-2013	-

Sheet No.: **A6**

Job No.: 12-39

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Beavercreek Live/Work

Oregon City, Oregon

Beavercreek Road, LLC

Conceptual Building Elevation

Live/Work Townhomes

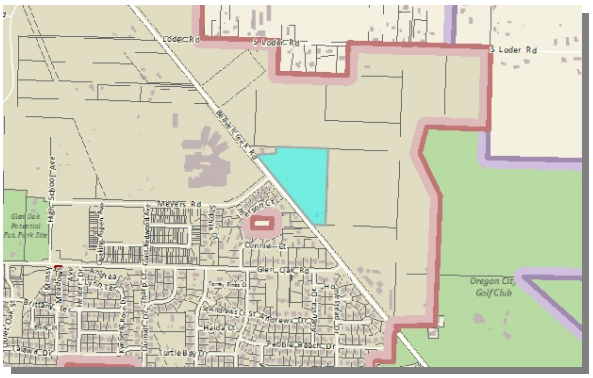
Scale:	Drawn By:	Date:	Date Plotted:
NTS	APT	07-09-2013	-

Sheet No.: **A7**

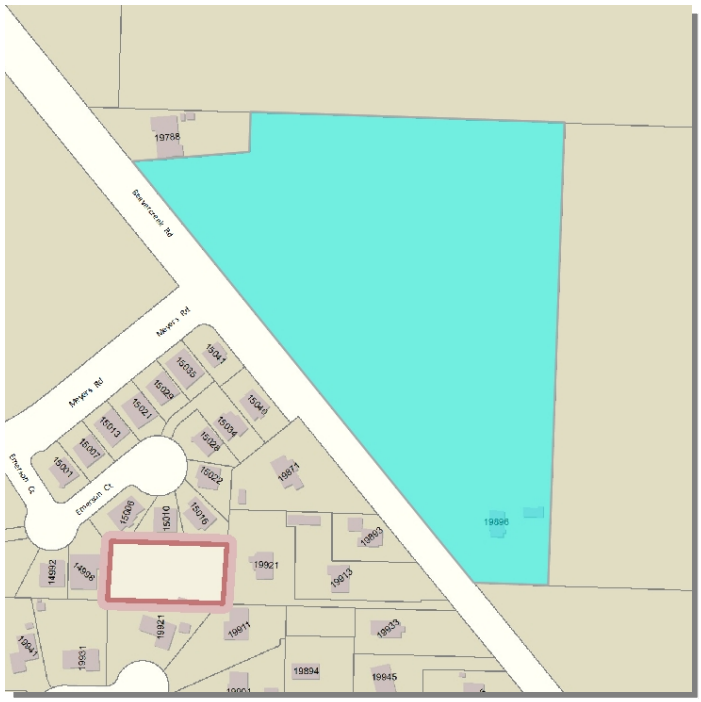
Job No.: **12-39**

Taxlot Detail Report

Taxlot: 3-2E-10C -00800



Overview Map



Taxlot highlighted in blue

Taxlot Information

APN: 3-2E-10C -00800
Alt ID: 00870711
Site Address: 19896 BEAVERCREEK RD
OREGON CITY, OR 97045
Year Built: 1945

Taxpayer Information

Taxpayer: *Suppressed*
Address: *Suppressed*

Reference Information

Parcel Area (acres - approx): 9.7
Parcel Area (sq. ft. - approx): 423,403
Twn/Rng/Sec: 03S 02E 10
Tax Map Reference: 32E10C

Values

Mkt Values as of: 10/10/2012
Land Value (Mkt): $800,000
Building Value (Mkt): $1,500
Exempt Amount: $0
Net Value (Mkt): $801,500
Note: These are Market, NOT Assessed values.
Assessed Value: $224,097

Planning Designations

Zoning: MUC1
- Mixed Use Corridor District

Comprehensive Plan: muc
- Mixed Use - Corridor

Subdivision: NONE
PUD (if known):
Neighborhood Assn: Caufield NA
Urban Renewal District:
Historic District:
Historic Designated Structure? N
In Willamette Greenway? N
In Geologic Hazard? N
In Nat. Res. Overlay District (NROD)? N
In 1996 Floodplain? N

Report generated 5/14/2013 9:35 AM

City of Oregon City
PO Box 3040
625 Center St
Oregon City, OR 97045
(503) 657-0891
www.orcity.org

ENGINEERS PLANNERS SURVEYORS

PRELIMINARY STORMWATER DESIGN REPORT

BEAVERCREEK LIVE/WORK DEVELOPMENT

Prepared For:
City of Oregon City, Oregon

January, 2014

Contact Person:
Brian D. Lee, PE
503.597.3222
brianl@paceengrs.com

PACE
An Engineering Services Company

TABLE OF CONTENTS

1.0 PURPOSE OF REPORT

2.0 PROJECT LOCATION/DESCRIPTION

3.0 REGULATORY DESIGN CRITERIA

- 3.1 STORMWATER QUANTITY MANAGEMENT CRITERIA
- 3.2 STORMWATER QUALITY MANAGEMENT CRITERIA
- 3.3 FLOOD PLAIN

4.0 SUMMARY OF STORMWATER DETENTION RESULTS

5.0 SOURCES OF INFORMATION AND DESIGN METHODOLOGY

6.0 DESIGN PARAMETERS

- 6.1 DESIGN STORM
  - 6.1.1 STORMWATER DETENTION FACILITY DESIGN
  - 6.1.2 INLET AND CONDUIT SIZING
- 6.2 PRE-DEVELOPED SITE TOPOGRAPHY AND LAND USE
  - 6.2.1 SITE TOPOGRAPHY
  - 6.2.2 LAND USE
  - 6.2.3 PRE-DEVELOPED INPUT PARAMETERS
- 6.3 SOIL TYPE
- 6.4 POST-DEVELOPED SITE TOPOGRAPHY AND LAND USE
  - 6.4.1 SITE TOPOGRAPHY
  - 6.4.2 LAND USE
  - 6.4.3 POST-DEVELOPED INPUT PARAMETERS
- 6.5 DESCRIPTION OF OFF-SITE CONTRIBUTORY BASINS

7.0 CALCULATION METHODOLOGY

- 7.1 PROPOSED STORMWATER CONDUIT SIZING AND INLET SPACING
- 7.2 PROPOSED STORMWATER QUANTITY CONTROL FACILITY DESIGN
- 7.3 PROPOSED STORMWATER QUALITY CONTROL FACILITY DESIGN
- 7.4 ENERGY DISSIPATER CALCULATIONS
- 7.5 DOWNSTREAM ANALYSIS
- 7.6 CULVERT ANALYSIS

8.0 STORMWATER QUANTITY CONTROL FACILITY OPERATION

9.0 STORMWATER QUALITY CONTROL FACILITY OPERATION

10.0 STORMWATER DETENTION POND SAFEGUARDS

APPENDIX 1 - VICINITY MAP

APPENDIX 2 - PRE-DEVELOPED SITE HYDROGRAPHS AND FLOW DETAILS

APPENDIX 3 - POST-DEVELOPED HYDROGRAPH AND FLOW DETAILS

APPENDIX 4 - WATER QUALITY STRUCTURE CUT SHEETS

APPENDIX 5 - SAMPLE MAINTENANCE AGREMENT

APPENDIX 6 - SOIL INFORMATION

PRELIMINARY STORMWATER REPORT
BEAVERCREEK LIVE/WORK DEVELOPMENT

1.0 PURPOSE OF REPORT

The purpose of this report is to documentation of the criteria for which the stormwater facility for this site was designed to meet, the sources of information upon which the analysis is based, the design methodology, and the results of the analysis.

2.0 PROJECT LOCATION/DESCRIPTION

The proposed development is on approximately 9.59 acres located at 19896 Beavercreek Road in Oregon City, 97045.

The property is located within the Southeast one-quarter of section 10, township 3 South, Range 2 East, Willamette Meridian, City of Oregon City, Clackamas County, Oregon. It is also identified as Tax Lot 800, Clackamas County Assessor's Map No. 3S2E-10C.

Stormwater from the site is proposed to be routed to a stormwater detention and water quality facility that will be constructed under common landscape areas at the low end of the property – See the preliminary site plan, grading plan and drainage utility plan for design details.

3.0 REGULATORY DESIGN CRITERIA

3.1 STORMWATER QUANTITY MANAGEMENT CRITERIA

The allowable stormwater discharge rate for the development must not exceed its pre-developed state. See Table 4.0 for a summary of discharges calculated using the SBUA method.

The design storms are based on the standard SCS Type 1A rainfall distribution with a 24- hour distribution and a total depth of 2.6" (2-year), 3.1" (5-year), 3.4" (10-year), 4.0" (25-year), and 4.5" (100-year).

3.2 STORMWATER QUALITY MANAGEMENT CRITERIA

The required stormwater quality management criteria are summarized below:

Ownership and Maintenance

Water quality for the development will be installed as a privately maintained system. The system will treat storm water from private building site areas and for public roadways. Accordingly, the developer will provide the City of Oregon City an access easement to maintain these private storm water quality facilities should it become necessary. Otherwise the operation and ownership of storm water quality facilities will be the responsibility of the developer. A

operations and management manual for the storm water facilities will be provide to the City during final engineering design and before the issuance of building permits.

Water Quality Design Storm

The water quality design storm is 1/3 of the SCS 2-year / 24-hour design storm (0.87").

Proposed Water Quality Treatment Methods.

The water quality treatment will be achieved with the use of stormwater quality filter cartridges that are a product of Contech industries. Filter Cartridges will be installed in specific manholes and catch basins in accordance with the manufactures sizing recommendations. The net result will achieve the treatment of the design storm as discussed above.

3.3 FLOOD PLAIN

There are no flood plains shown on the Flood Insurance Rate Map (FIRM) produced by the Federal Emergency Management Agency (FEMA).

4.0 SUMMARY OF STORMWATER DETENTION RESULTS

Design Storm	Target Release Rate Pre-Developed Conditions	Release Rate **Without** the Proposed Stormwater Detention Facilities – Post Development	Release Rate **With** the Proposed Stormwater Detention Facilities – Post Development
2-year	3.47	4.43	3.18
5-year	4.58	5.43	3.71
10-year	5.25	6.03	4.05
25-year	6.62	7.25	6.55

5.0 SOURCES OF INFORMATION AND DESIGN METHODOLOGY

The Santa Barbara Urban Hydrograph (SBUH) Method was used for the stormwater analysis. This method utilizes the SCS Type 1A 24-hour storm. HydroCAD software aided in the analysis. References are cited at the end of the report.

6.0 DESIGN PARAMETERS

6.1 DESIGN STORM

See Section 3.0 above

6.1.1 STORMWATER DETENTION FACILITY DESIGN

All of the flow results in stormwater summary Table 4.0 are incorporated in the detention tank sizing and analysis. The flow results stated in the table reflect the maximum flows released from the flow control manhole at the outlet of the tank. The detention tank consists for 3 – 60" diameter pipes, each 125 feet long for a total of 375 feet of storage.

6.1.2 INLET AND CONDUIT SIZING

The stormwater inlets (catch basins) for the site are placed according to the grading (at all low points in grade and other necessary locations) and will adequately handle the stormwater for the site. Oversized catch basin curb inlets will be placed at all low points to increase flow capacity that may be diminished seasonally due to deciduous trees. The distance between catch basins is generally less than 100 feet.

The stormwater pipes will be sized from the SBUH method to adequately convey up to the 25-year storm event (gravity flow). Flows above the 25 year event (e.g. a 100 year event) will flow through the systems using a combination of gravity flow and hydraulic surcharging (HGL above the top of pipe but 6 inches or more below the rim elevations of catch basins.

6.2 PRE-DEVELOPED SITE TOPOGRAPHY AND LAND USE

6.2.1 SITE TOPOGRAPHY

The site slopes to the north and west with slopes generally equal to or less than 6%.

6.2.2 EXISTING LAND USE

There is an existing home and barn at the southeast uppermost elevation of the site – generally the site is an open field that was previously cultivated..

6.2.3 PRE-DEVELOPED INPUT PARAMETERS

The input parameters are shown for the pre-developed sub catchment (basin) in the appendices.

6.3 SOIL TYPE

Below about 6" of topsoil, the soils consist mostly of silt with various traces of clay, sand and gravel. Occasional boulders were encountered from preliminary geotechnical site investigations. These soils are characterized as having a low stormwater infiltration potential. Within the depth of test pits observed on the site to depths of 15 plus feet, now groundwater was encountered. Per the City of Oregon City Stormwater and Grading Design Standards, these soils belong to Hydrologic soil group "C".

6.4 POST-DEVELOPED SITE TOPOGRAPHY AND LAND USE

6.4.1 SITE TOPOGRAPHY

The post-developed site topography will be altered from the pre-developed site topography to allow for the construction of streets, multifamily housing, live/work housing, a community center and a small commercial building. Surface cuts and fills may exceed 6 feet respectively. Please see the preliminary grading plans.

6.4.2 LAND USE

The current zoning on the property is MUC-1. See the development application for specific land uses and proposed improvements.

6.4.3 POST-DEVELOPED INPUT PARAMETERS

The input parameters are shown for the post-development subcatchment (basin) and detention tank in the appendices. The calculation method for determination of impervious area was to take 20% of the site and assume it was landscaped (pervious) and the remaining 80% as developed (impervious).

6.5 DESCRIPTION OF OFF-SITE CONTRIBUTORY BASINS

There are no off-site contributing areas. The development is located at the highest reaches of its containing watershed.

7.0 CALCULATION METHODOLOGY

7.1 PROPOSED STORMWATER CONDUIT SIZING AND INLET SPACING

The proposed stormwater pipes will be sized during final engineering from the SBUH method and will adequately convey the 25-year storm event (gravity flow). Flows above the 25 year event (e.g. a 100 year event) will flow through the systems using a combination of gravity flow and hydraulic surcharging (HGL above the top of pipe but 6 inches or more below the rim elevations of catch basins.

7.2 PROPOSED STORMWATER QUANTITY CONTROL (DETENTION) FACILITY DESIGN

The input parameters are shown for the subcatchment (basin) and the tanl in the appendices. They are determined by topographic survey information, aerial photos and contours, design, and analysis. The hydrographs were created with HydroCAD software.

7.3 PROPOSED STORMWATER QUALITY CONTROL FACILITY DESIGN

Half of the water quality design storm (1/3 of the 2-year storm) flow rate will be used to determine the type and quantity of cartridges for the water quality catch basins and manholes.

7.4 ENERGY DISSIPATER CALCULATIONS

Rip-rap will be placed at the inlet and outlet of the discharge to the roadside ditch along Beavercreek Road to act as an energy dissipater. The required rip-rap size shall be a minimum of Class 100.

7.5 DOWNSTREAM ANALYSIS

This site is located in the CAUFIELD Basin (designated in the City's Drainage Master Plan). Per *City of Oregon City Public Works Stormwater and Grading Design Standards (November 17, 1999),* the 10-year storm event is used for downstream analysis when the contributing drainage area is less than 40 acres The stormwater discharge from the on-site tank (post-developed condition) will discharge into the existing drainage way, as it currently does (pre-developed condition). The release (peak stormwater runoff) rates from the on-site detention pond for the 2, 5, 10 and 25 year storm events are less or approximately the same as the existing peak stormwater runoff rates for the same storm events at the existing outfall location. Therefore, the proposed development will not have any measurable increase in flow rates on the existing downstream conveyance systems during design storm events.

7.6 CULVERT ANALYSIS

No culverts are proposed on the site.

8.0 STORMWATER QUANTITY CONTROL FACILITY OPERATION

The control manhole will operate on gravity flow and will not reuire and operational control. Regular, routine maintenance to ensure that the orifices are clear of debris, the pipes are clear of sediment, and the outfall is not eroding the roadside ditch..

The grading and compaction guidelines from the *City of Oregon City Public Works Stormwater and Grading Design Standards (November 17, 1999)* shall be adhered to the maximum extent possible.

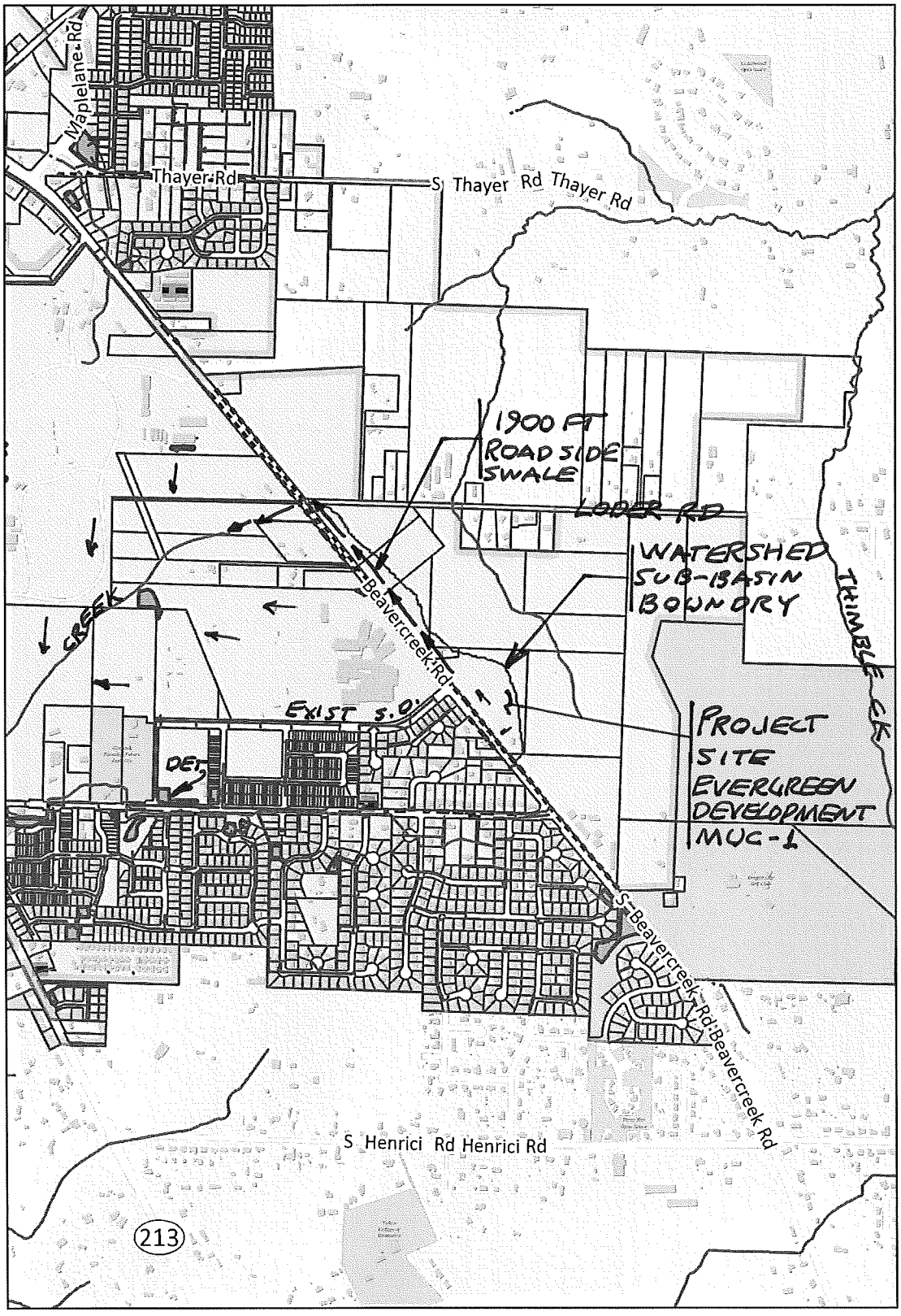
9.0 STORMWATER QUALITY CONTROL FACILITY OPERATION

The stormwater for the site will be routed through a series of water quality catch basins, pipes, and manholes. The catch basins will be sumped and the manholes will have treatment processes that through gravitational settling and biological processes and hydraulic residence time, water quality treatment will be achieved.

10.0 STORMWATER DETENTION POND SAFEGUARDS

Calculations for the 100-year storm event were done to size the emergency overflow. The stormwater tank emergency overflow pipe designed to adequately handle this storm event. If the outlet structure becomes plugged or for some other reason cannot convey the stormwater, then the stormwater will overflow through this emergency overflow. A channel lined with rip-rap will serve as an overflow to release stormwater in the event that the outlet structure is plugged. The emergency overflows are sized to accommodate the flows from the 100-year storm (assuming the outlet structure is plugged).

Oregon City GIS Map

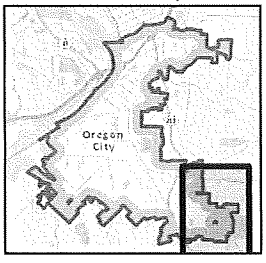


Legend

- Streams
  - Above Ground
  - Below Ground
- Taxlots
- Unimproved ROW
- Storm Conduits (City Owned)
  - Pipe
  - Culvert
  - Ditch
  - Detention Tank
- Storm Ponds
  - Pond
  - Swale
  - Man-Made Wetland
- City Limits
- UGB

Notes

Overview Map



N

0 1,246 Feet

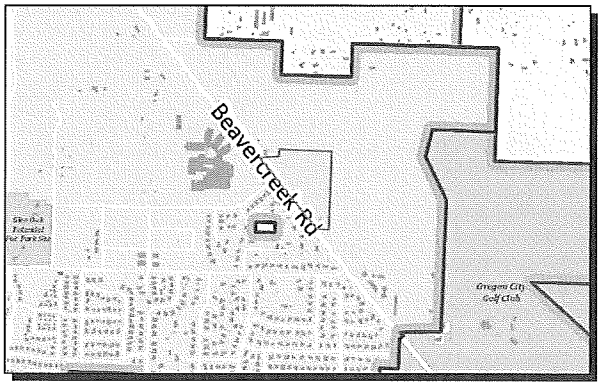
1: 14,948

City of Oregon City
PO Box 3040
625 Center St
Oregon City
OR 97045
(503) 657-0891
www.orcity.org

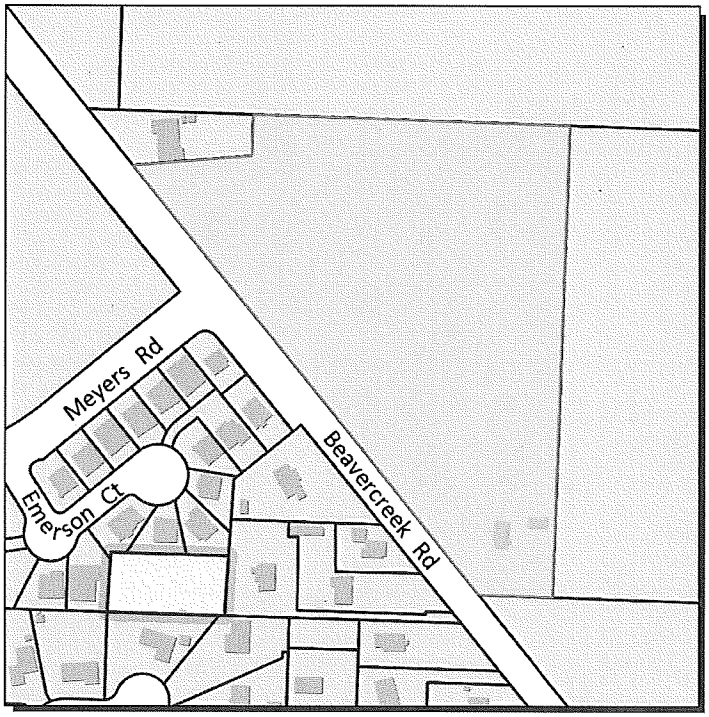
Map created 1/7/2014

Taxlot Detail Report

Taxlot: 3-2E-10C -00800



Overview Map



Taxlot highlighted in blue

Taxlot Information

APN: 3-2E-10C -00800

Alt ID: 00870711

Site Address: 19896 BEAVERCREEK RD
OREGON CITY, OR 97045

Year Built: 1945

Taxpayer Information

Taxpayer: *Suppressed*

Address: *Suppressed*

Reference Information

Parcel Area (acres - approx): 9.7

Parcel Area (sq. ft. - approx): 423,403

Twn/Rng/Sec: 03S 02E 10

Tax Map Reference: 32E10C

Values

Mkt Values as of: 10/10/2012

Land Value (Mkt): $800,000

Building Value (Mkt): $1,500

Exempt Amount: $0

Net Value (Mkt): $801,500

Note: These are Market, NOT Assessed values.

Assessed Value: $224,097

Planning Designations

Zoning: MUC1
- Mixed Use Corridor District

Comprehensive Plan: muc
- Mixed Use - Corridor

Subdivision: NONE

PUD (if known):

Neighborhood Assn: Caufield NA

Urban Renewal District:

Historic District:

Historic Designated Structure? N

In Willamette Greenway? N

In Geologic Hazard? N

In Nat. Res. Overlay District (NROD)? N

In 1996 Floodplain? N

Report generated 12/19/2013 12:57 PM

City of Oregon City
PO Box 3040
625 Center St
Oregon City, OR 97045
(503) 657-0891
www.orcity.org

PRE

Subcat Reach Pond Link

Routing Diagram for BeaverCreek Road.PRE
Prepared by Hewlett-Packard Company, Printed 1/7/2014

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.450	79	50-75% Grass cover, Fair, HSG C (1S)
9.090	90	Fallow, crop residue, Poor, HSG C (1S)
0.050	98	Unconnected roofs, HSG C (1S)
9.590	**90**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
9.590	HSG C	1S
0.000	HSG D	
0.000	Other	
9.590		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.450	0.000	0.000	0.450	50-75% Grass cover, Fair	1S
0.000	0.000	9.090	0.000	0.000	9.090	Fallow, crop residue, Poor	1S
0.000	0.000	0.050	0.000	0.000	0.050	Unconnected roofs	1S
0.000	**0.000**	**9.590**	**0.000**	**0.000**	**9.590**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PRE Runoff Area=9.590 ac 0.52% Impervious Runoff Depth>1.32"
Flow Length=900' Slope=0.0650 '/' Tc=9.8 min CN=89/98 Runoff=3.47 cfs 1.059 af

Total Runoff Area = 9.590 ac Runoff Volume = 1.059 af Average Runoff Depth = 1.32"
99.48% Pervious = 9.540 ac 0.52% Impervious = 0.050 ac

Summary for Subcatchment 1S: PRE

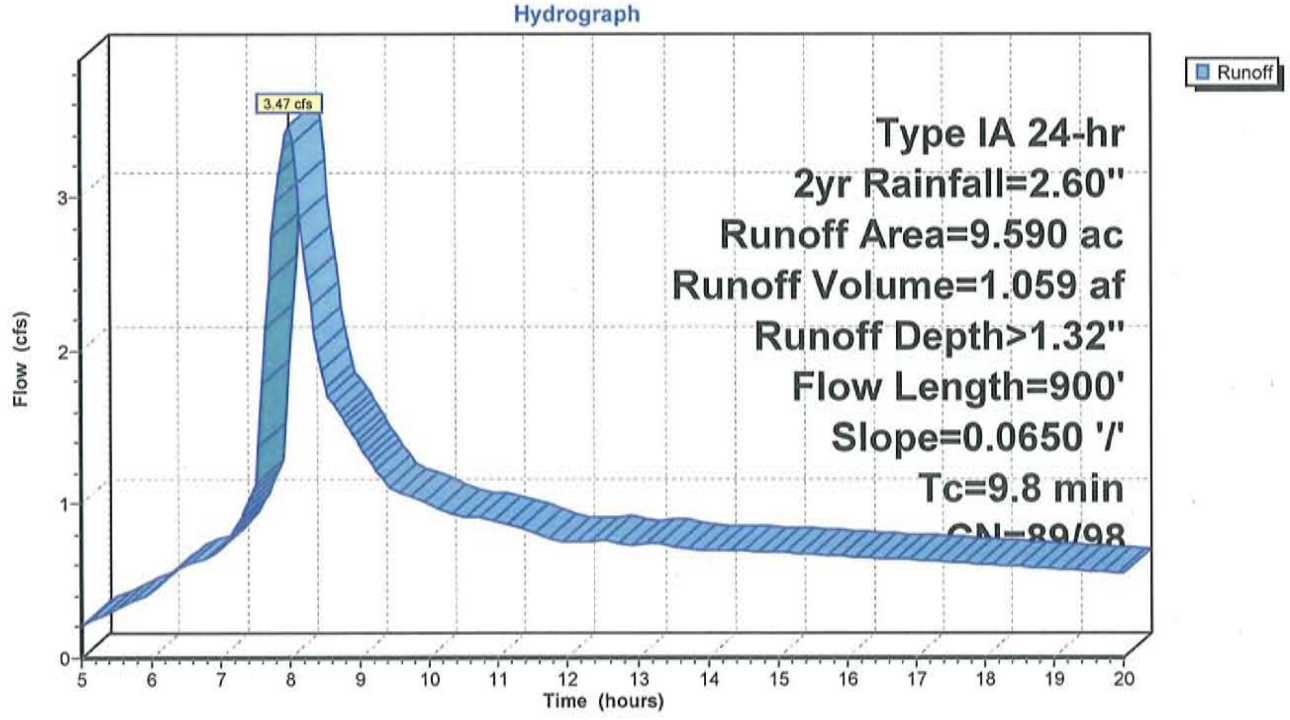
Runoff = 3.47 cfs @ 7.99 hrs, Volume= 1.059 af, Depth> 1.32"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2yr Rainfall=2.60"

Area (ac)	CN	Description
0.050	98	Unconnected roofs, HSG C
0.450	79	50-75% Grass cover, Fair, HSG C
9.090	90	Fallow, crop residue, Poor, HSG C
9.590	90	Weighted Average
9.540	89	99.48% Pervious Area
0.050	98	0.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	300	0.0650	0.74		**Sheet Flow, Grass Field** Fallow n= 0.050 P2= 2.60"
2.8	300	0.0650	1.78		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
0.2	300	0.0650	24.21	242.08	**Channel Flow, Ditch** Area= 10.0 sf Perim= 6.0' r= 1.67' n= 0.022 Earth, clean & straight
9.8	900	Total			

Subcatchment 1S: PRE



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PRE Runoff Area=9.590 ac 0.52% Impervious Runoff Depth>1.71"
Flow Length=900' Slope=0.0650 '/' Tc=9.8 min CN=89/98 Runoff=4.58 cfs 1.365 af

Total Runoff Area = 9.590 ac Runoff Volume = 1.365 af Average Runoff Depth = 1.71"
99.48% Pervious = 9.540 ac 0.52% Impervious = 0.050 ac

Summary for Subcatchment 1S: PRE

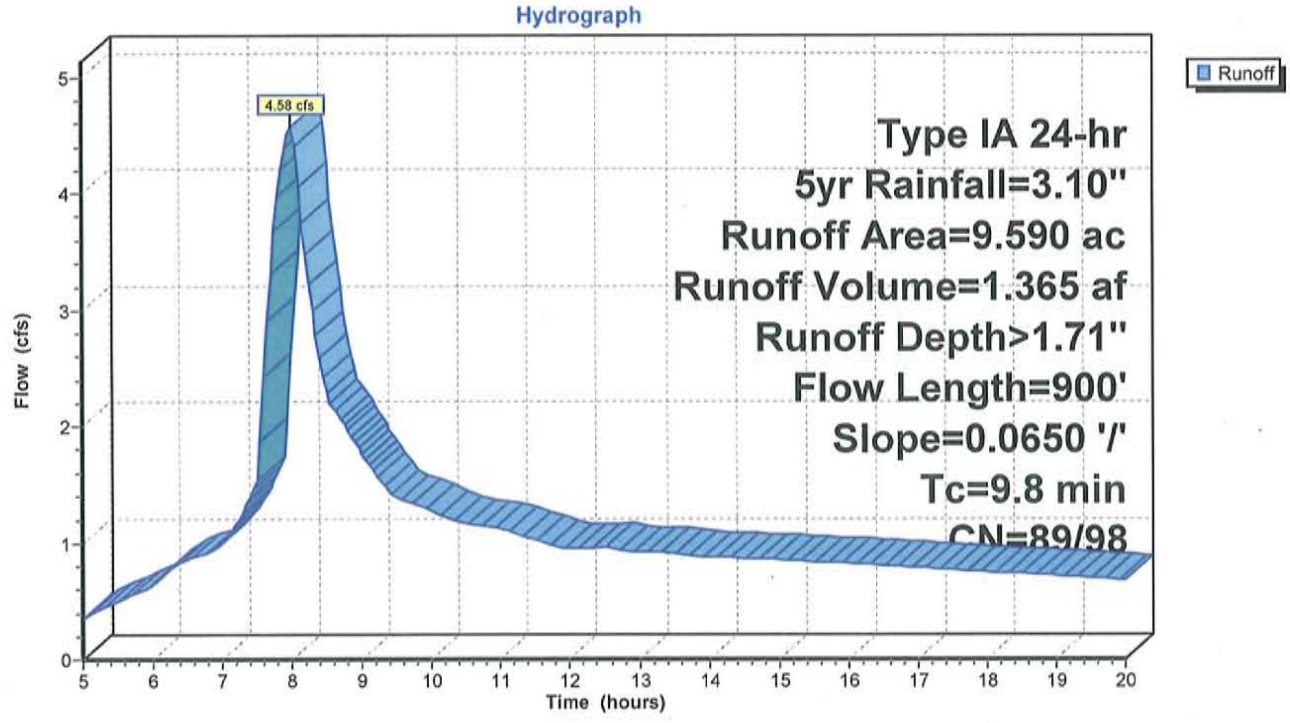
Runoff = 4.58 cfs @ 7.99 hrs, Volume= 1.365 af, Depth> 1.71"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5yr Rainfall=3.10"

Area (ac)	CN	Description
0.050	98	Unconnected roofs, HSG C
0.450	79	50-75% Grass cover, Fair, HSG C
9.090	90	Fallow, crop residue, Poor, HSG C
9.590	90	Weighted Average
9.540	89	99.48% Pervious Area
0.050	98	0.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	300	0.0650	0.74		**Sheet Flow, Grass Field** Fallow n= 0.050 P2= 2.60"
2.8	300	0.0650	1.78		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
0.2	300	0.0650	24.21	242.08	**Channel Flow, Ditch** Area= 10.0 sf Perim= 6.0' r= 1.67' n= 0.022 Earth, clean & straight
9.8	900	Total			

Subcatchment 1S: PRE



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PRE Runoff Area=9.590 ac 0.52% Impervious Runoff Depth>1.94"
Flow Length=900' Slope=0.0650 '/' Tc=9.8 min CN=89/98 Runoff=5.25 cfs 1.551 af

Total Runoff Area = 9.590 ac Runoff Volume = 1.551 af Average Runoff Depth = 1.94"
99.48% Pervious = 9.540 ac 0.52% Impervious = 0.050 ac

Summary for Subcatchment 1S: PRE

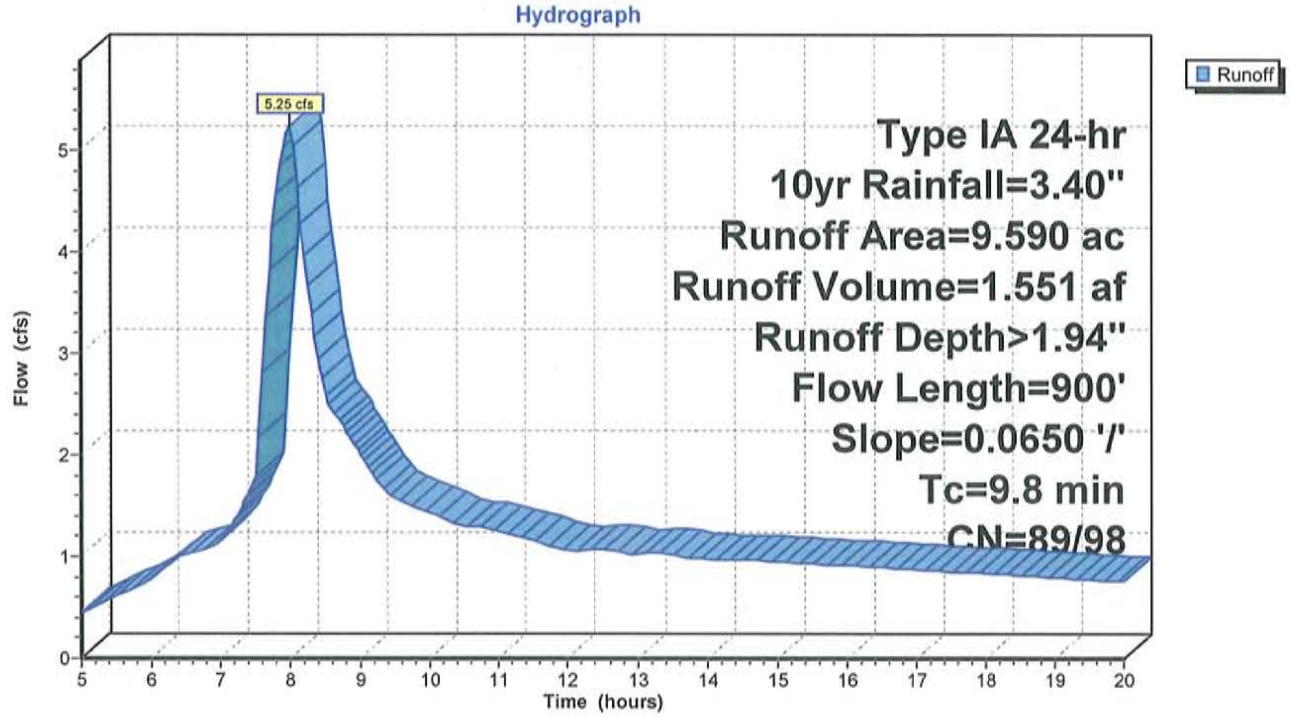
Runoff = 5.25 cfs @ 7.99 hrs, Volume= 1.551 af, Depth> 1.94"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10yr Rainfall=3.40"

Area (ac)	CN	Description
0.050	98	Unconnected roofs, HSG C
0.450	79	50-75% Grass cover, Fair, HSG C
9.090	90	Fallow, crop residue, Poor, HSG C
9.590	90	Weighted Average
9.540	89	99.48% Pervious Area
0.050	98	0.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	300	0.0650	0.74		**Sheet Flow, Grass Field** Fallow n= 0.050 P2= 2.60"
2.8	300	0.0650	1.78		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
0.2	300	0.0650	24.21	242.08	**Channel Flow, Ditch** Area= 10.0 sf Perim= 6.0' r= 1.67' n= 0.022 Earth, clean & straight
9.8	900	Total			

Subcatchment 1S: PRE



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PRE Runoff Area=9.590 ac 0.52% Impervious Runoff Depth>2.41"
Flow Length=900' Slope=0.0650 '/' Tc=9.8 min CN=89/98 Runoff=6.62 cfs 1.927 af

Total Runoff Area = 9.590 ac Runoff Volume = 1.927 af Average Runoff Depth = 2.41"
99.48% Pervious = 9.540 ac 0.52% Impervious = 0.050 ac

Summary for Subcatchment 1S: PRE

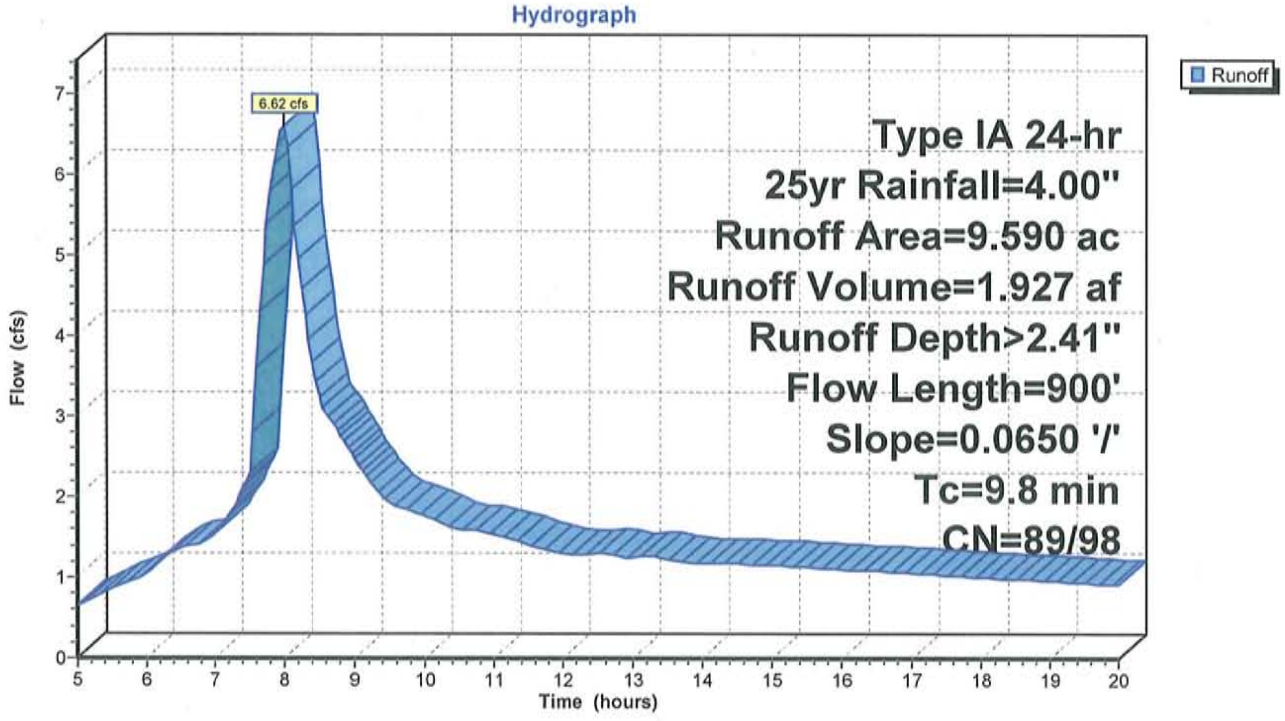
Runoff = 6.62 cfs @ 7.99 hrs, Volume= 1.927 af, Depth> 2.41"

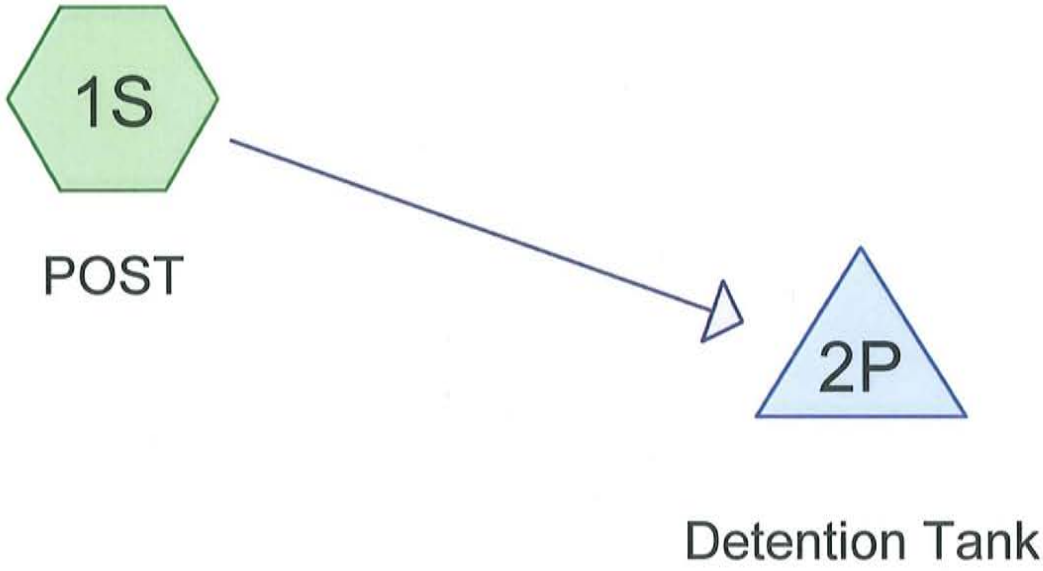
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25yr Rainfall=4.00"

Area (ac)	CN	Description
0.050	98	Unconnected roofs, HSG C
0.450	79	50-75% Grass cover, Fair, HSG C
9.090	90	Fallow, crop residue, Poor, HSG C
9.590	90	Weighted Average
9.540	89	99.48% Pervious Area
0.050	98	0.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	300	0.0650	0.74		**Sheet Flow, Grass Field** Fallow n= 0.050 P2= 2.60"
2.8	300	0.0650	1.78		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
0.2	300	0.0650	24.21	242.08	**Channel Flow, Ditch** Area= 10.0 sf Perim= 6.0' r= 1.67' n= 0.022 Earth, clean & straight
9.8	900	Total			

Subcatchment 1S: PRE





Subcat Reach Pond Link

Routing Diagram for BeaverCreek Road.POST
Prepared by Hewlett-Packard Company, Printed 1/7/2014

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.920	79	50-75% Grass cover, Fair, HSG C (1S)
7.670	98	Paved parking, HSG C (1S)
9.590	**94**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
9.590	HSG C	1S
0.000	HSG D	
0.000	Other	
9.590		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	1.920	0.000	0.000	1.920	50-75% Grass cover, Fair	1S
0.000	0.000	7.670	0.000	0.000	7.670	Paved parking	1S
0.000	**0.000**	**9.590**	**0.000**	**0.000**	**9.590**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1S	0.00	0.00	500.0	0.0600	0.010	12.0	0.0	0.0
2	2P	100.50	98.00	50.0	0.0500	0.010	36.0	0.0	0.0

Time span=1.00-24.00 hrs, dt=0.05 hrs, 461 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: POST Runoff Area=9.590 ac 79.98% Impervious Runoff Depth>2.07"
Flow Length=850' Tc=14.1 min CN=79/98 Runoff=4.43 cfs 1.651 af

Pond 2P: Detention Tank Peak Elev=103.10' Storage=0.089 af Inflow=4.43 cfs 1.651 af
Outflow=3.18 cfs 1.645 af

Total Runoff Area = 9.590 ac Runoff Volume = 1.651 af Average Runoff Depth = 2.07"
20.02% Pervious = 1.920 ac 79.98% Impervious = 7.670 ac

Summary for Subcatchment 1S: POST

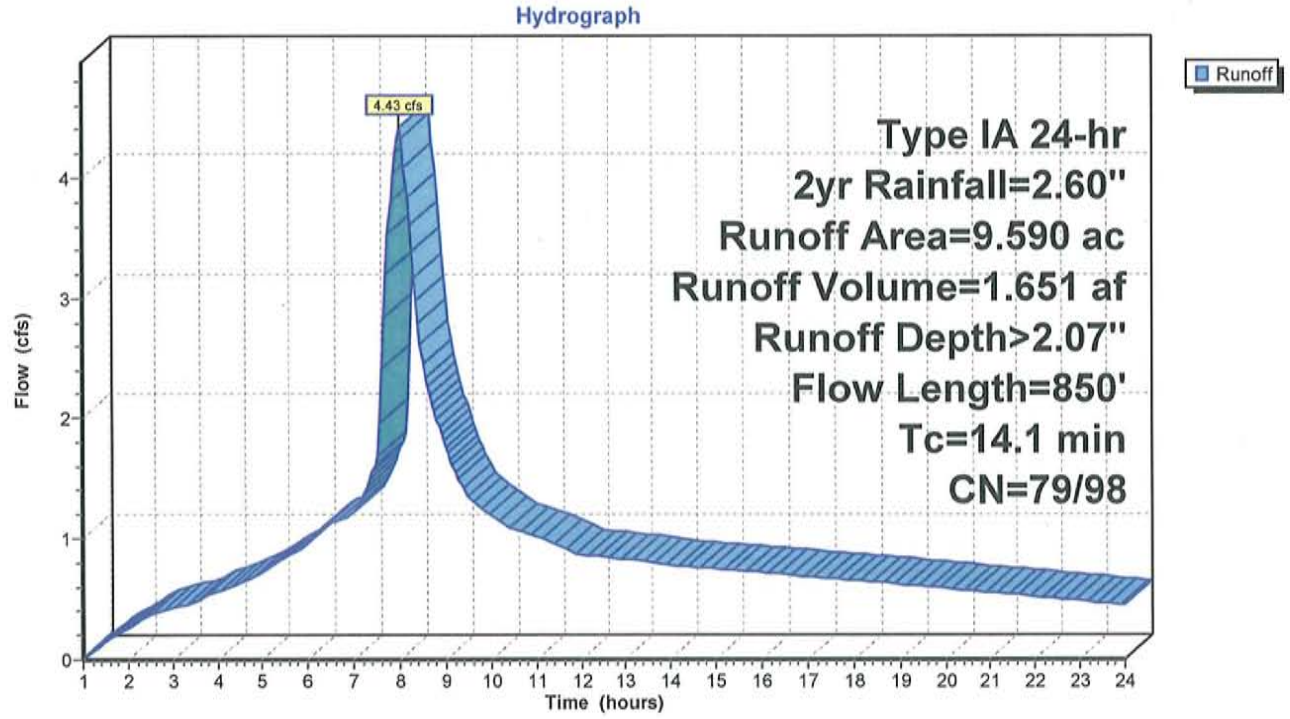
Runoff = 4.43 cfs @ 8.00 hrs, Volume= 1.651 af, Depth> 2.07"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2yr Rainfall=2.60"

Area (ac)	CN	Description
1.920	79	50-75% Grass cover, Fair, HSG C
7.670	98	Paved parking, HSG C
9.590	94	Weighted Average
1.920	79	20.02% Pervious Area
7.670	98	79.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 1S: POST



Summary for Pond 2P: Detention Tank

[82] Warning: Early inflow requires earlier time span

Inflow Area = 9.590 ac, 79.98% Impervious, Inflow Depth > 2.07" for 2yr event
Inflow = 4.43 cfs @ 8.00 hrs, Volume= 1.651 af
Outflow = 3.18 cfs @ 8.30 hrs, Volume= 1.645 af, Atten= 28%, Lag= 18.3 min
Primary = 3.18 cfs @ 8.30 hrs, Volume= 1.645 af

Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 103.10' @ 8.30 hrs Surf.Area= 0.043 ac Storage= 0.089 af

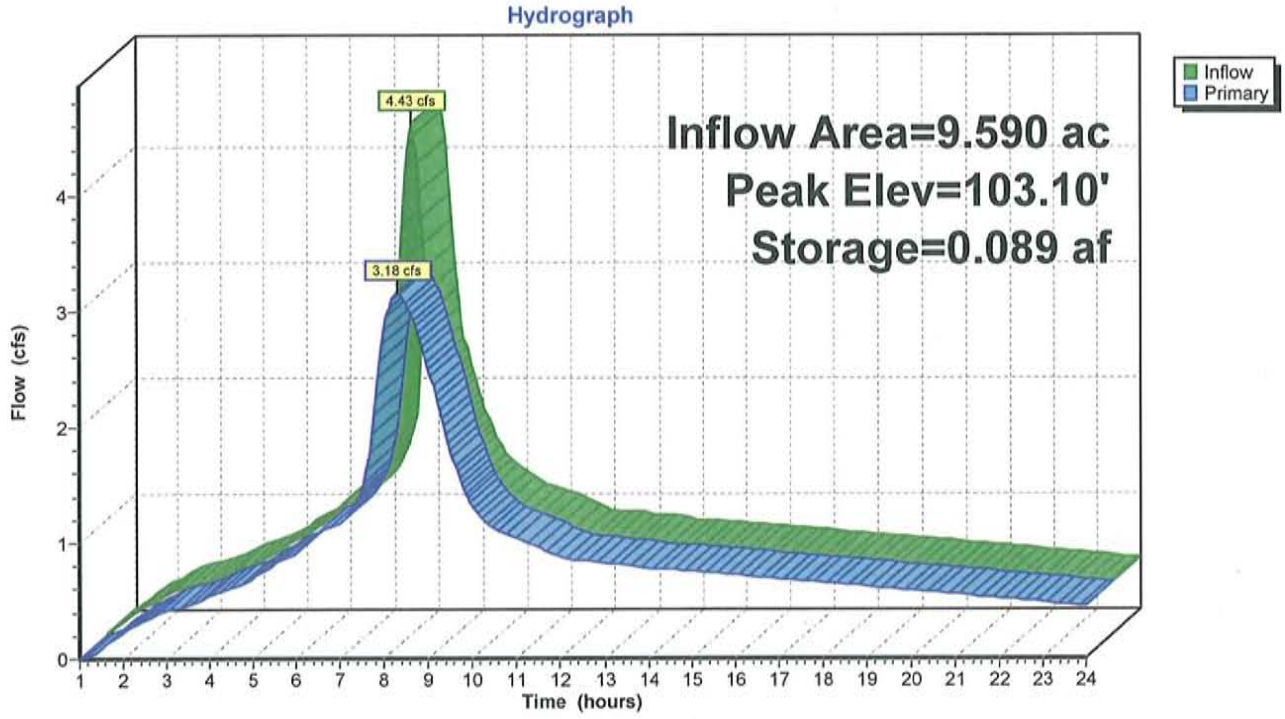
Plug-Flow detention time= 10.7 min calculated for 1.642 af (99% of inflow)
Center-of-Mass det. time= 8.1 min (701.7 - 693.6)

Volume	Invert	Avail.Storage	Storage Description
#1	100.50'	0.169 af	**60.0" Round CMP_Round 60"** x 3 L= 125.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.50'	**36.0" Round CMP_Round 36"** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.50' / 98.00' S= 0.0500 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	100.50'	**9.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	105.00'	**16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.18 cfs @ 8.30 hrs HW=103.10' (Free Discharge)
└─**1=CMP_Round 36"** (Passes 3.18 cfs of 35.79 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 3.18 cfs @ 7.19 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: Detention Tank



Time span=1.00-24.00 hrs, dt=0.05 hrs, 461 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: POST Runoff Area=9.590 ac 79.98% Impervious Runoff Depth>2.53"
Flow Length=850' Tc=14.1 min CN=79/98 Runoff=5.43 cfs 2.024 af

Pond 2P: Detention Tank Peak Elev=103.92' Storage=0.123 af Inflow=5.43 cfs 2.024 af
Outflow=3.71 cfs 2.018 af

Total Runoff Area = 9.590 ac Runoff Volume = 2.024 af Average Runoff Depth = 2.53"
20.02% Pervious = 1.920 ac 79.98% Impervious = 7.670 ac

Summary for Subcatchment 1S: POST

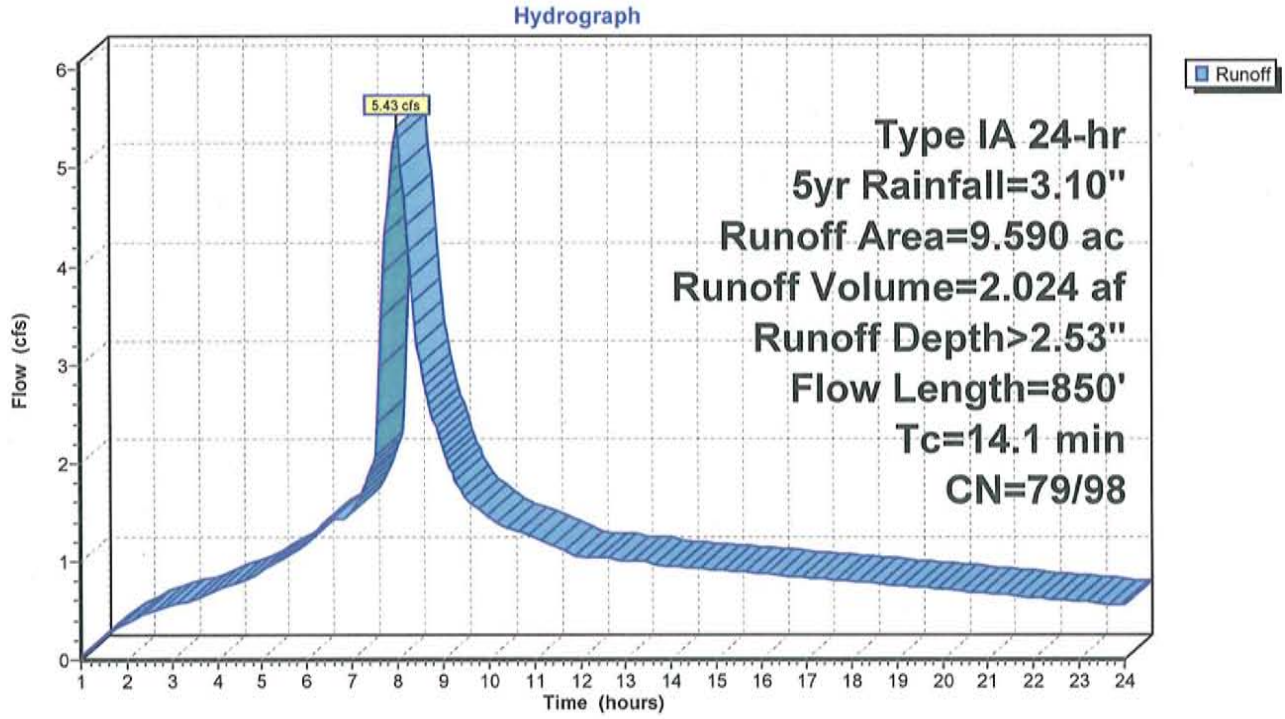
Runoff = 5.43 cfs @ 8.00 hrs, Volume= 2.024 af, Depth> 2.53"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5yr Rainfall=3.10"

Area (ac)	CN	Description
1.920	79	50-75% Grass cover, Fair, HSG C
7.670	98	Paved parking, HSG C
9.590	94	Weighted Average
1.920	79	20.02% Pervious Area
7.670	98	79.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 1S: POST



Summary for Pond 2P: Detention Tank

[82] Warning: Early inflow requires earlier time span

Inflow Area = 9.590 ac, 79.98% Impervious, Inflow Depth > 2.53" for 5yr event
Inflow = 5.43 cfs @ 8.00 hrs, Volume= 2.024 af
Outflow = 3.71 cfs @ 8.34 hrs, Volume= 2.018 af, Atten= 32%, Lag= 20.4 min
Primary = 3.71 cfs @ 8.34 hrs, Volume= 2.018 af

Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 103.92' @ 8.34 hrs Surf.Area= 0.040 ac Storage= 0.123 af

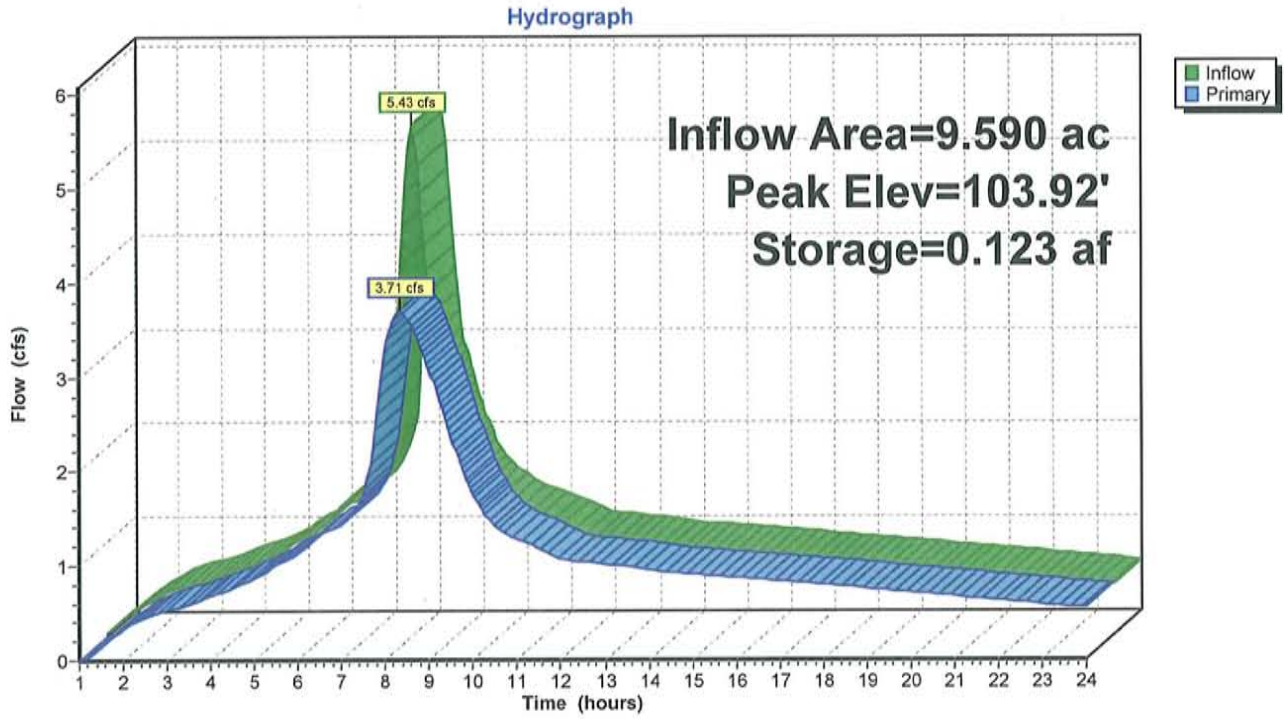
Plug-Flow detention time= 11.7 min calculated for 2.017 af (100% of inflow)
Center-of-Mass det. time= 9.2 min (698.1 - 688.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.50'	0.169 af	**60.0" Round CMP_Round 60"** x 3 L= 125.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.50'	**36.0" Round CMP_Round 36"** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.50' / 98.00' S= 0.0500 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	100.50'	**9.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	105.00'	**16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.71 cfs @ 8.34 hrs HW=103.92' (Free Discharge)
└─**1=CMP_Round 36"** (Passes 3.71 cfs of 47.10 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 3.71 cfs @ 8.40 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: Detention Tank



Time span=1.00-24.00 hrs, dt=0.05 hrs, 461 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: POST Runoff Area=9.590 ac 79.98% Impervious Runoff Depth>2.82"
Flow Length=850' Tc=14.1 min CN=79/98 Runoff=6.03 cfs 2.250 af

Pond 2P: Detention Tank Peak Elev=104.50' Storage=0.145 af Inflow=6.03 cfs 2.250 af
Outflow=4.05 cfs 2.243 af

Total Runoff Area = 9.590 ac Runoff Volume = 2.250 af Average Runoff Depth = 2.82"
20.02% Pervious = 1.920 ac 79.98% Impervious = 7.670 ac

Summary for Subcatchment 1S: POST

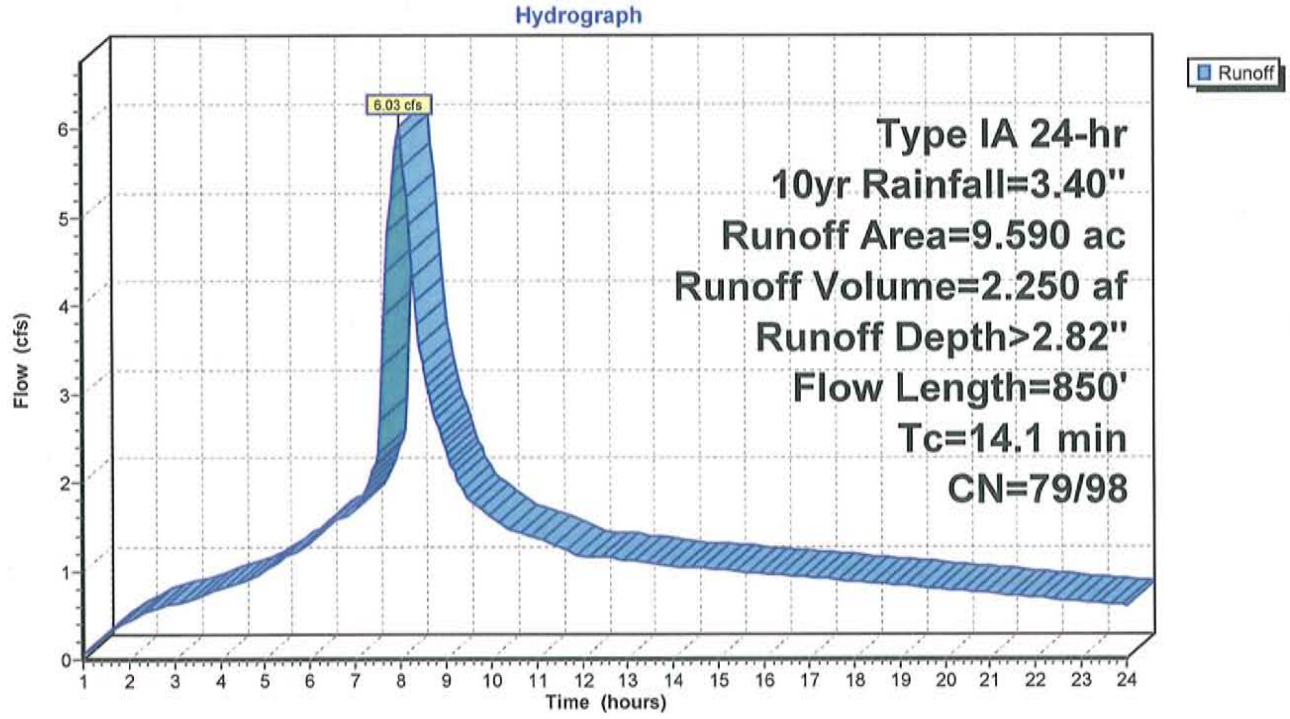
Runoff = 6.03 cfs @ 8.00 hrs, Volume= 2.250 af, Depth> 2.82"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10yr Rainfall=3.40"

Area (ac)	CN	Description
1.920	79	50-75% Grass cover, Fair, HSG C
7.670	98	Paved parking, HSG C
9.590	94	Weighted Average
1.920	79	20.02% Pervious Area
7.670	98	79.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 1S: POST



Summary for Pond 2P: Detention Tank

[82] Warning: Early inflow requires earlier time span

Inflow Area = 9.590 ac, 79.98% Impervious, Inflow Depth > 2.82" for 10yr event
Inflow = 6.03 cfs @ 8.00 hrs, Volume= 2.250 af
Outflow = 4.05 cfs @ 8.35 hrs, Volume= 2.243 af, Atten= 33%, Lag= 21.2 min
Primary = 4.05 cfs @ 8.35 hrs, Volume= 2.243 af

Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 104.50' @ 8.35 hrs Surf.Area= 0.034 ac Storage= 0.145 af

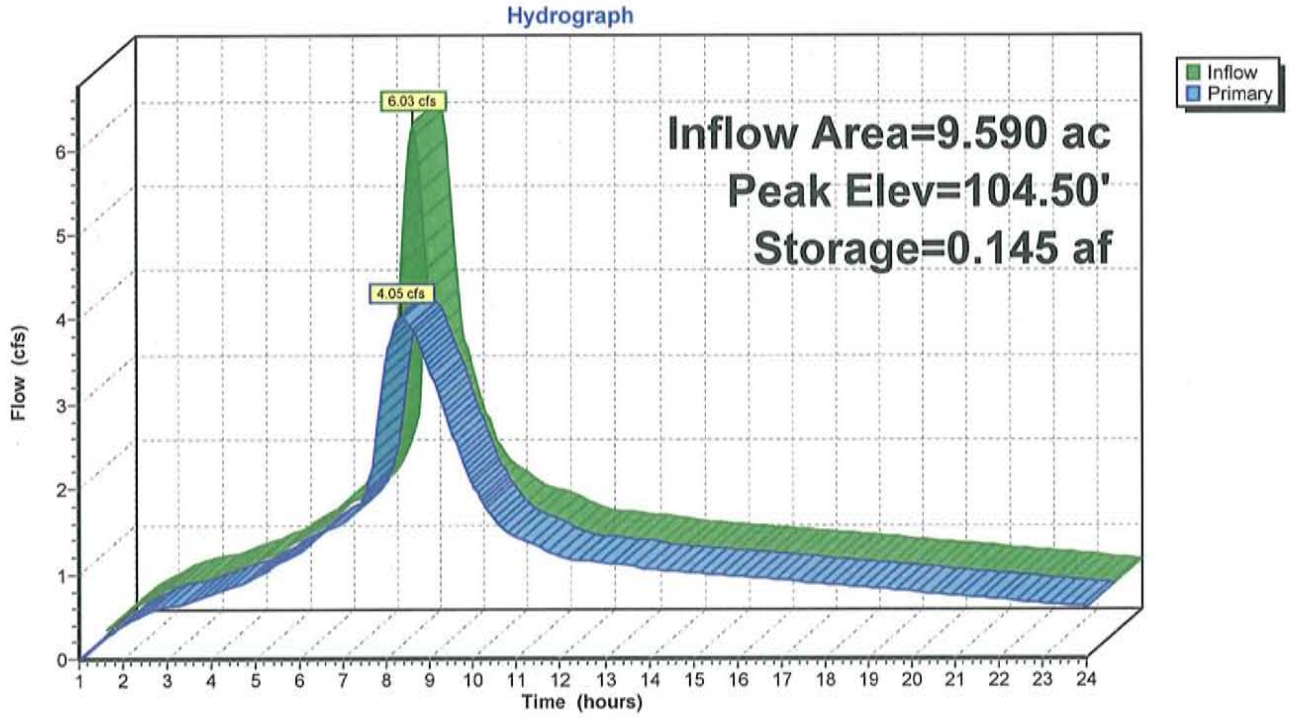
Plug-Flow detention time= 12.4 min calculated for 2.243 af (100% of inflow)
Center-of-Mass det. time= 9.9 min (696.6 - 686.6)

Volume	Invert	Avail.Storage	Storage Description
#1	100.50'	0.169 af	**60.0" Round CMP_Round 60"** x 3 L= 125.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.50'	**36.0" Round CMP_Round 36"** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.50' / 98.00' S= 0.0500 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	100.50'	**9.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	105.00'	**16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.05 cfs @ 8.35 hrs HW=104.50' (Free Discharge)
└─**1=CMP_Round 36"** (Passes 4.05 cfs of 53.79 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 4.05 cfs @ 9.16 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: Detention Tank



Time span=1.00-24.00 hrs, dt=0.05 hrs, 461 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: POST Runoff Area=9.590 ac 79.98% Impervious Runoff Depth>3.39"
Flow Length=850' Tc=14.1 min CN=79/98 Runoff=7.25 cfs 2.706 af

Pond 2P: Detention Tank Peak Elev=105.29' Storage=0.167 af Inflow=7.25 cfs 2.706 af
Outflow=6.55 cfs 2.697 af

Total Runoff Area = 9.590 ac Runoff Volume = 2.706 af Average Runoff Depth = 3.39"
20.02% Pervious = 1.920 ac 79.98% Impervious = 7.670 ac

Summary for Subcatchment 1S: POST

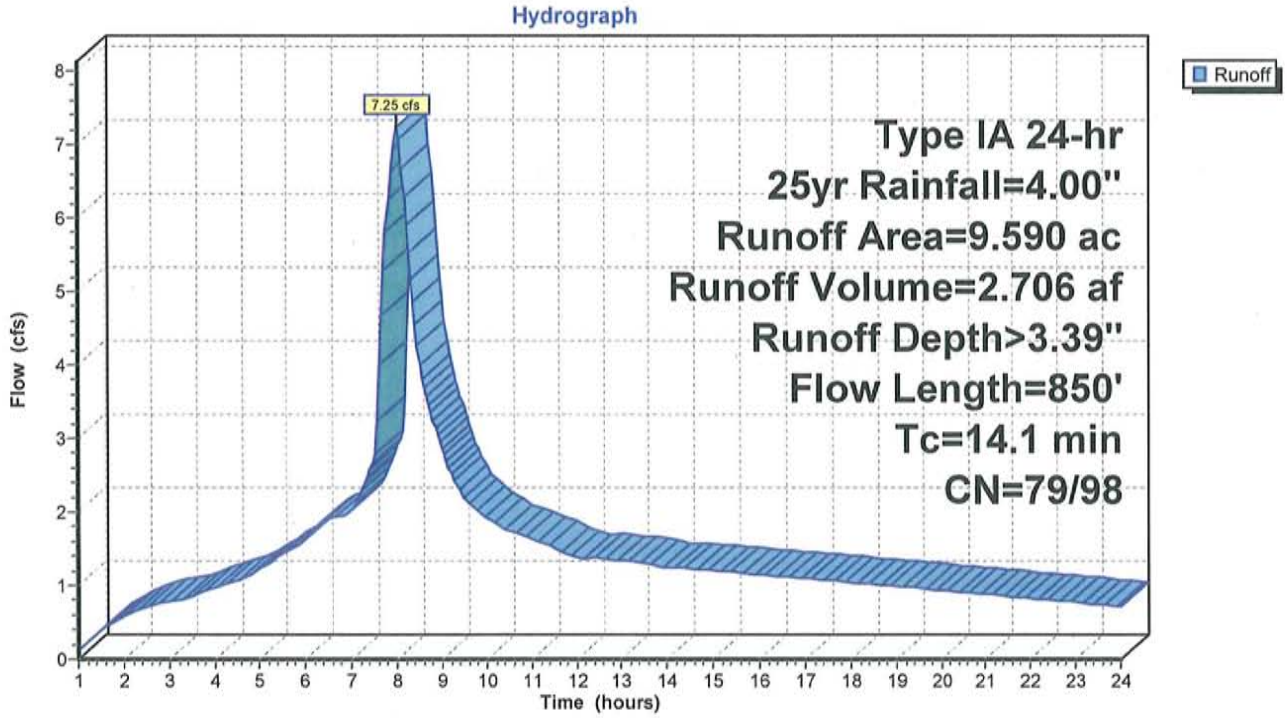
Runoff = 7.25 cfs @ 8.00 hrs, Volume= 2.706 af, Depth> 3.39"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25yr Rainfall=4.00"

Area (ac)	CN	Description
1.920	79	50-75% Grass cover, Fair, HSG C
7.670	98	Paved parking, HSG C
9.590	94	Weighted Average
1.920	79	20.02% Pervious Area
7.670	98	79.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 1S: POST



Summary for Pond 2P: Detention Tank

[82] Warning: Early inflow requires earlier time span

Inflow Area = 9.590 ac, 79.98% Impervious, Inflow Depth > 3.39" for 25yr event
Inflow = 7.25 cfs @ 8.00 hrs, Volume= 2.706 af
Outflow = 6.55 cfs @ 8.16 hrs, Volume= 2.697 af, Atten= 10%, Lag= 9.7 min
Primary = 6.55 cfs @ 8.16 hrs, Volume= 2.697 af

Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 105.29' @ 8.16 hrs Surf.Area= 0.017 ac Storage= 0.167 af

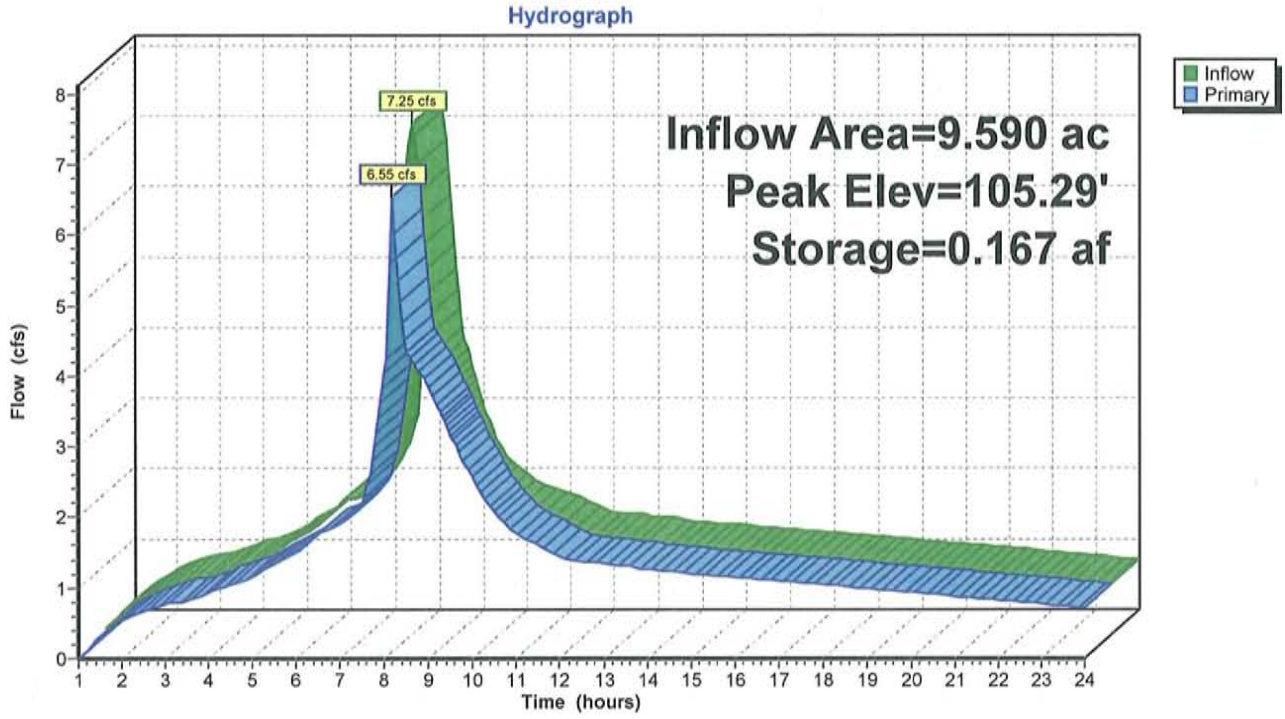
Plug-Flow detention time= 13.2 min calculated for 2.697 af (100% of inflow)
Center-of-Mass det. time= 10.7 min (693.6 - 682.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.50'	0.169 af	**60.0" Round CMP_Round 60"** x 3 L= 125.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.50'	**36.0" Round CMP_Round 36"** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.50' / 98.00' S= 0.0500 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	100.50'	**9.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	105.00'	**16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

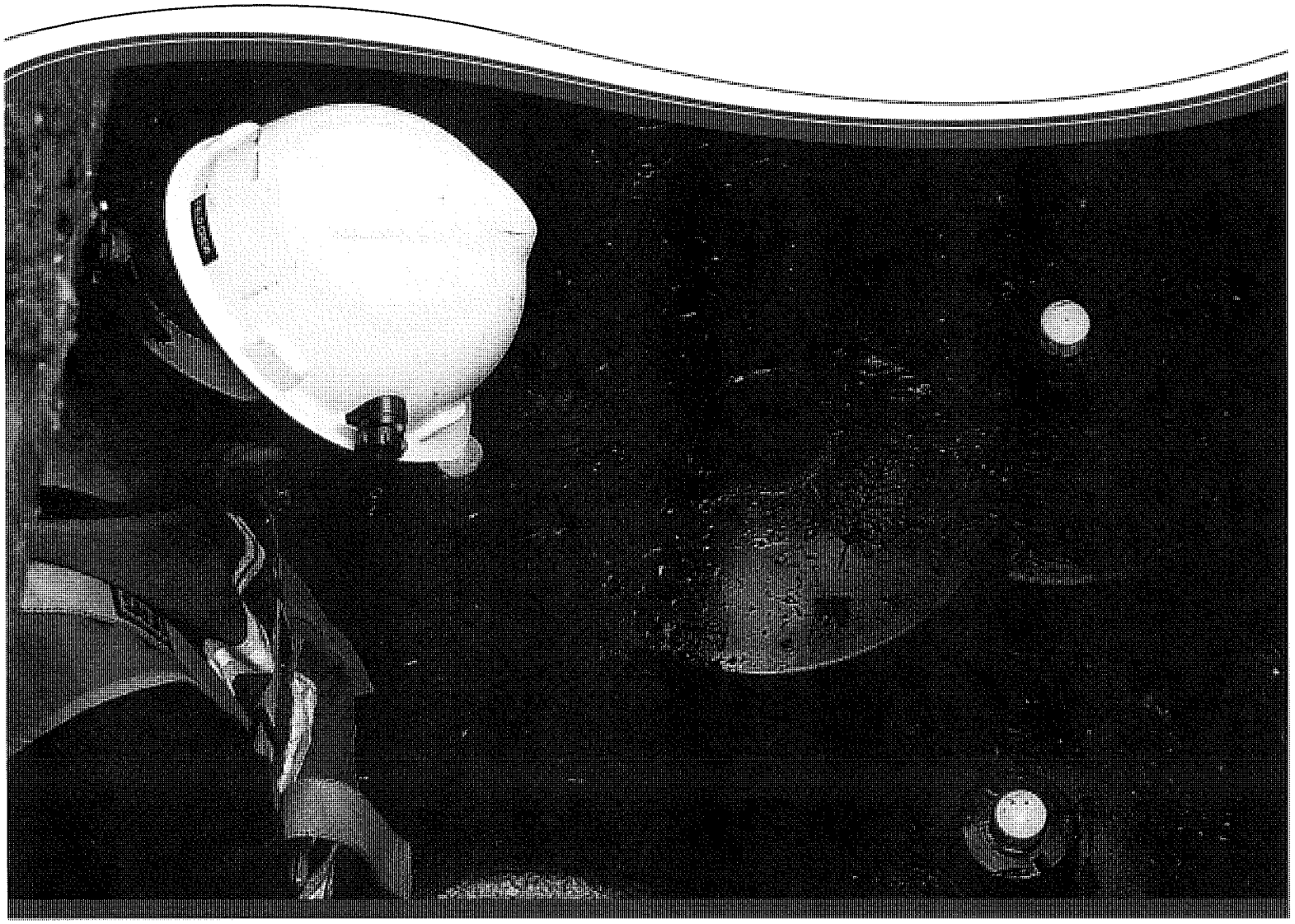
Primary OutFlow Max=6.45 cfs @ 8.16 hrs HW=105.28' (Free Discharge)
└─**1=CMP_Round 36"** (Passes 6.45 cfs of 61.61 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 4.46 cfs @ 10.10 fps)
  └─**3=Orifice/Grate** (Weir Controls 1.99 cfs @ 1.72 fps)

Pond 2P: Detention Tank



CONTECH
CONSTRUCTION PRODUCTS INC.

StormFilter Inspection and Maintenance Procedures



The Stormwater Management StormFilter®

Maintenance Guidelines

The primary purpose of the Stormwater Management StormFilter® is to filter out and prevent pollutants from entering our waterways. Like any effective filtration system, periodically these pollutants must be removed to restore the StormFilter to its full efficiency and effectiveness.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. Maintenance activities may be required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms. It is a good practice to inspect the system after major storm events.

Maintenance Procedures

Although there are likely many effective maintenance options, we believe the following procedure is efficient and can be implemented using common equipment and existing maintenance protocols. A two step procedure is recommended as follows:

1. Inspection

Inspection of the vault interior to determine the need for maintenance.

2. Maintenance

Cartridge replacement

Sediment removal

Inspection and Maintenance Timing

At least one scheduled inspection should take place per year with maintenance following as warranted.

First, an inspection should be done before the winter season. During the inspection the need for maintenance should be determined and, if disposal during maintenance will be required, samples of the accumulated sediments and media should be obtained.

Second, if warranted, a maintenance (replacement of the filter cartridges and removal of accumulated sediments) should be performed during periods of dry weather.

In addition to these two activities, it is important to check the condition of the StormFilter unit after major storms for potential damage caused by high flows and for high sediment accumulation that may be caused by localized erosion in the drainage area. It may be necessary to adjust the inspection/ maintenance schedule depending on the actual operating conditions encountered by the system. In general, inspection activities can be conducted at any time, and maintenance should occur, if warranted, in late summer to early fall when flows into the system are not likely to be present.

Maintenance Frequency

The primary factor controlling timing of maintenance of the StormFilter is sediment loading.

A properly functioning system will remove solids from water by trapping particulates in the porous structure of the filter media inside the cartridges. The flow through the system will naturally decrease as more and more particulates are trapped. Eventually the flow through the cartridges will be low enough to require replacement. It may be possible to extend the usable span of the cartridges by removing sediment from upstream trapping devices on a routine as-needed basis in order to prevent material from being re-suspended and discharged to the StormFilter treatment system.

Site conditions greatly influence maintenance requirements. StormFilter units located in areas with erosion or active construction may need to be inspected and maintained more often than those with fully stabilized surface conditions.

The maintenance frequency may be adjusted as additional monitoring information becomes available during the inspection program. Areas that develop known problems should be inspected more frequently than areas that demonstrate no problems, particularly after major storms. Ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual StormFilter system or site. It is recommended that the site owner develop a database to properly manage StormFilter inspection and maintenance programs.

Prior to the development of the maintenance database, the following maintenance frequencies should be followed:

Inspection

One time per year

After major storms

Maintenance

As needed, based on results of inspection (The average maintenance lifecycle is approximately 1-3 years)

Per Regulatory requirement

In the event of a chemical spill

Frequencies should be updated as required. The recommended initial frequency for inspection is one time per year. StormFilter units should be inspected after major storms.

Sediment removal and cartridge replacement on an as needed basis is recommended unless site conditions warrant.

Once an understanding of site characteristics has been established, maintenance may not be needed for one to three years, but inspection is warranted and recommended annually.

Inspection Procedures

The primary goal of an inspection is to assess the condition of the cartridges relative to the level of visual sediment loading as it relates to decreased treatment capacity. It may be desirable to conduct this inspection during a storm to observe the relative flow through the filter cartridges. If the submerged cartridges are severely plugged, then typically large amounts of sediments will be present and very little flow will be discharged from the drainage pipes. If this is the case, then maintenance is warranted and the cartridges need to be replaced.

Warning: In the case of a spill, the worker should abort inspection activities until the proper guidance is obtained. Notify the local hazard control agency and CONTECH Construction Products immediately.

To conduct an inspection:

Important: Inspection should be performed by a person who is familiar with the operation and configuration of the StormFilter treatment unit.

1. If applicable, set up safety equipment to protect and notify surrounding vehicle and pedestrian traffic.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.

3. Open the access portals to the vault and allow the system vent.
4. Without entering the vault, visually inspect the inside of the unit, and note accumulations of liquids and solids.
5. Be sure to record the level of sediment build-up on the floor of the vault, in the forebay, and on top of the cartridges. If flow is occurring, note the flow of water per drainage pipe. Record all observations. Digital pictures are valuable for historical documentation.
6. Close and fasten the access portals.
7. Remove safety equipment.
8. If appropriate, make notes about the local drainage area relative to ongoing construction, erosion problems, or high loading of other materials to the system.
9. Discuss conditions that suggest maintenance and make decision as to weather or not maintenance is needed.

Maintenance Decision Tree

The need for maintenance is typically based on results of the inspection. The following Maintenance Decision Tree should be used as a general guide. (Other factors, such as Regulatory Requirements, may need to be considered)

1. Sediment loading on the vault floor.
   a. If >4" of accumulated sediment, maintenance is required.
2. Sediment loading on top of the cartridge.
   a. If >1/4" of accumulation, maintenance is required.
3. Submerged cartridges.
   a. If >4" of static water in the cartridge bay for more that 24 hours after end of rain event, maintenance is required.
4. Plugged media.
   a. If pore space between media granules is absent, maintenance is required.
5. Bypass condition.
   a. If inspection is conducted during an average rain fall event and StormFilter remains in bypass condition (water over the internal outlet baffle wall or submerged cartridges), maintenance is required.
6. Hazardous material release.
   a. If hazardous material release (automotive fluids or other) is reported, maintenance is required.
7. Pronounced scum line.
   a. If pronounced scum line (say ≥ 1/4" thick) is present above top cap, maintenance is required.
8. Calendar Lifecycle.
   a. If system has not been maintained for 3 years maintenance is required.

Assumptions

- No rainfall for 24 hours or more
- No upstream detention (at least not draining into StormFilter)
- Structure is online
- Outlet pipe is clear of obstruction
- Construction bypass is plugged

Maintenance

Depending on the configuration of the particular system, maintenance personnel will be required to enter the vault to perform the maintenance.

Important: If vault entry is required, OSHA rules for confined space entry must be followed.

Filter cartridge replacement should occur during dry weather. It may be necessary to plug the filter inlet pipe if base flows is occurring.

Replacement cartridges can be delivered to the site or customers facility. Information concerning how to obtain the replacement cartridges is available from CONTECH Construction Products.

Warning: In the case of a spill, the maintenance personnel should abort maintenance activities until the proper guidance is obtained. Notify the local hazard control agency and CONTECH Construction Products immediately.

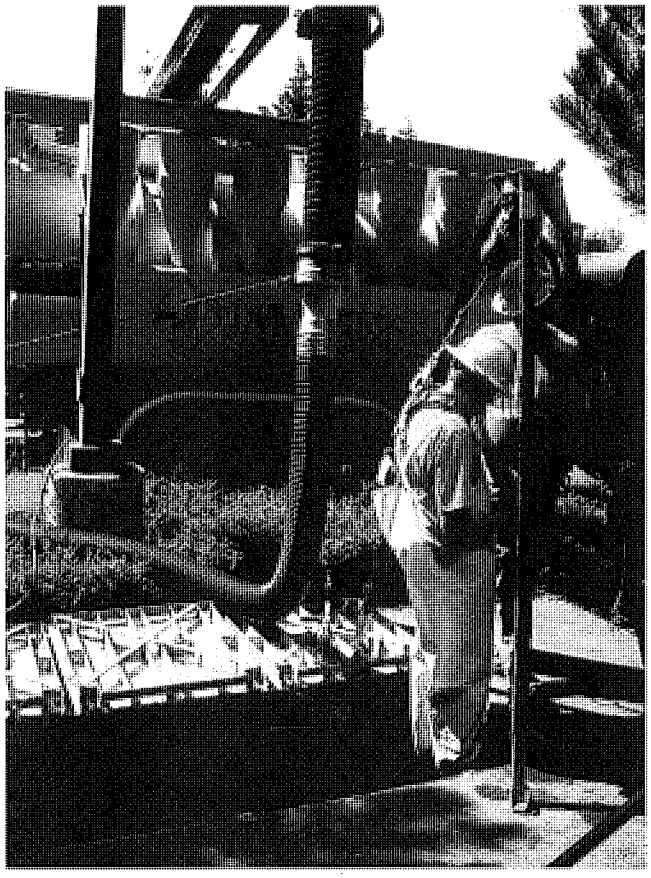
To conduct cartridge replacement and sediment removal maintenance:

1. If applicable, set up safety equipment to protect maintenance personnel and pedestrians from site hazards.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the doors (access portals) to the vault and allow the system to vent.
4. Without entering the vault, give the inside of the unit, including components, a general condition inspection.
5. Make notes about the external and internal condition of the vault. Give particular attention to recording the level of sediment build-up on the floor of the vault, in the forebay, and on top of the internal components.
6. Using appropriate equipment offload the replacement cartridges (up to 150 lbs. each) and set aside.
7. Remove used cartridges from the vault using one of the following methods:

Method 1:

A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Unscrew (counterclockwise rotations) each filter cartridge from the underdrain connector. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

Using appropriate hoisting equipment, attach a cable from the boom, crane, or tripod to the loose cartridge. Contact CONTECH Construction Products for suggested attachment devices.



Important: Note that cartridges containing leaf media (CSF) do not require unscrewing from their connectors. Take care not to damage the manifold connectors. This connector should remain installed in the manifold and could be capped during the maintenance activity to prevent sediments from entering the underdrain manifold.

B. Remove the used cartridges (up to 250 lbs. each) from the vault.

Important: Care must be used to avoid damaging the cartridges during removal and installation. The cost of repairing components damaged during maintenance will be the responsibility of the owner unless CONTECH Construction Products performs the maintenance activities and damage is not related to discharges to the system.

C. Set the used cartridge aside or load onto the hauling truck.

D. Continue steps a through c until all cartridges have been removed.

Method 2:

A. Enter the vault using appropriate confined space protocols.

B. Unscrew the cartridge cap.

C. Remove the cartridge hood screws (3) hood and float.

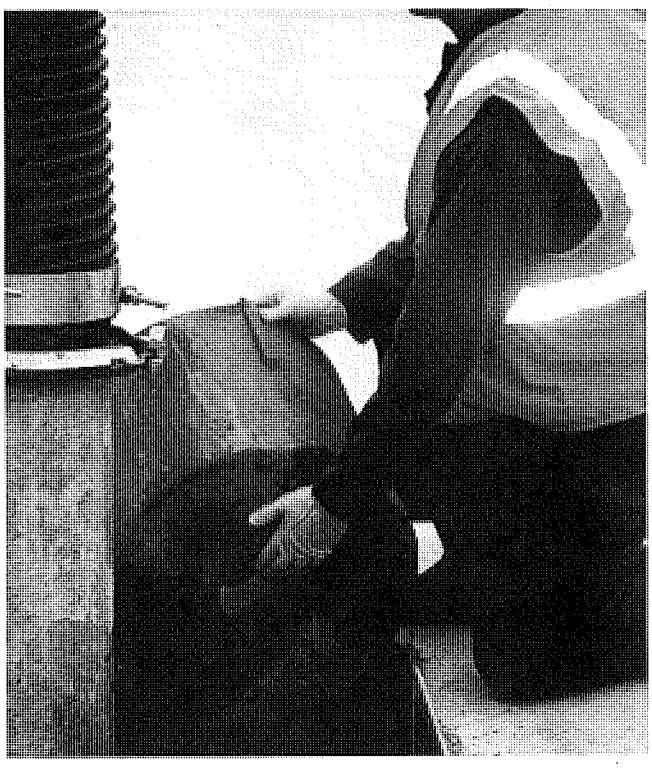
D. At location under structure access, tip the cartridge on its side.

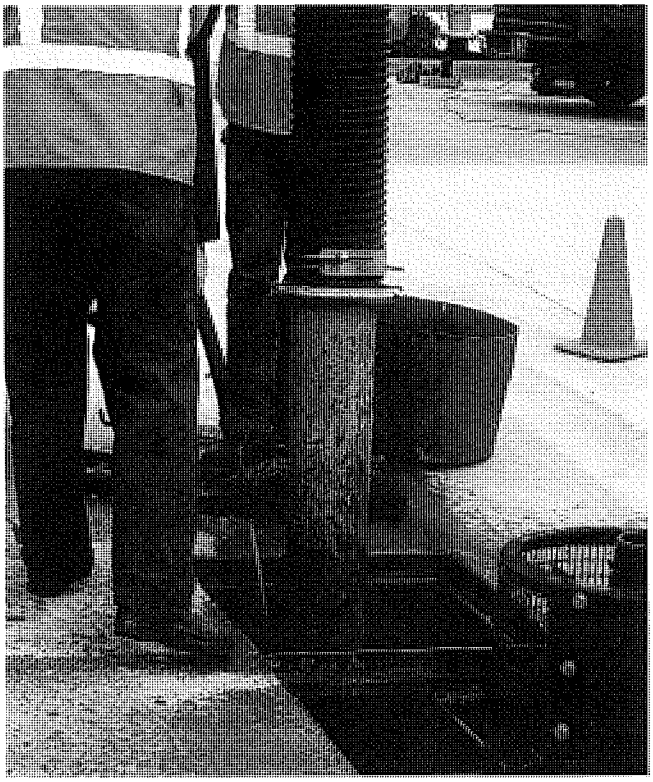
Important: Note that cartridges containing media other than the leaf media require unscrewing from their threaded connectors. Take care not to damage the manifold connectors. This connector should remain installed in the manifold and capped if necessary.

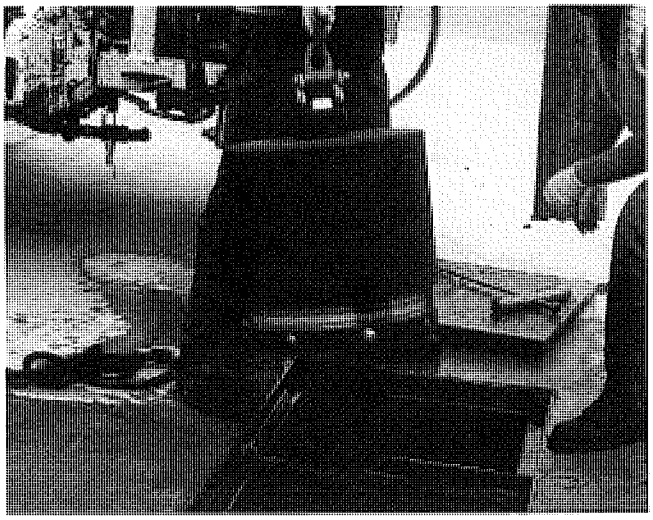
D. Empty the cartridge onto the vault floor. Reassemble the empty cartridge.

E. Set the empty, used cartridge aside or load onto the hauling truck.

F. Continue steps a through e until all cartridges have been removed.







8. Remove accumulated sediment from the floor of the vault and from the forebay. This can most effectively be accomplished by use of a vacuum truck.
9. Once the sediments are removed, assess the condition of the vault and the condition of the connectors. The connectors are short sections of 2-inch schedule 40 PVC, or threaded schedule 80 PVC that should protrude about 1" above the floor of the vault. Lightly wash down the vault interior.
   a. Replace any damaged connectors.
10. Using the vacuum truck boom, crane, or tripod, lower and install the new cartridges. Once again, take care not to damage connections.
11. Close and fasten the door.
12. Remove safety equipment.
13. Finally, dispose of the accumulated materials in accordance with applicable regulations. Make arrangements to return the used empty cartridges to CONTECH Construction Products.

Related Maintenance Activities -

Performed on an as-needed basis

StormFilter units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

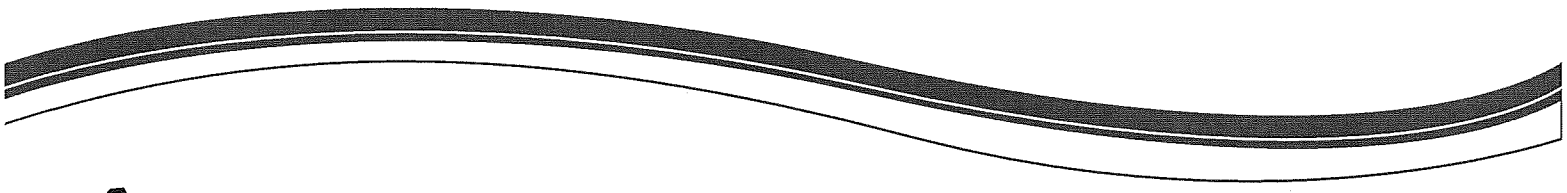
In order for maintenance of the StormFilter to be successful, it is imperative that all other components be properly maintained. The maintenance/repair of upstream facilities should be carried out prior to StormFilter maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads.

Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.



RECYCLED PAPER

CONTECH CONSTRUCTION PRODUCTS INC.
800.338.1122
www.contech-cpi.com

Support

- Drawings and specifications are available at contechstormwater.com.
- Site-specific design support is available from our engineers.

CONTECH Construction Products Inc. provides site solutions for the civil engineering industry. CONTECH's portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products. For information on other CONTECH division offerings, visit contech-cpi.com or call 800.338.1122

Nothing in this catalog should be construed as an expressed warranty or an implied warranty of merchantability or fitness for any particular purpose. See the CONTECH standard quotation or acknowledgement for applicable warranties and other terms and conditions of sale.

Inspection Report

Date: _____ Personnel: _____

Location: _____ System Size: _____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

Sediment Thickness in Forebay: _____ Date: _____

Sediment Depth on Vault Floor: _____

Structural Damage: _____

Estimated Flow from Drainage Pipes (if available): _____

Cartridges Submerged: Yes ☐ No ☐ Depth of Standing Water: _____

StormFilter Maintenance Activities (check off if done and give description)

☐ Trash and Debris Removal: _____

☐ Minor Structural Repairs: _____

☐ Drainage Area Report _____

Excessive Oil Loading: Yes ☐ No ☐ Source: _____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: _____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: _____

Items Needing Further Work: _____

Owners should contact the local public works department and inquire about how the department disposes of their street waste residuals.

Other Comments:

_____

_____

_____

_____

_____

_____

_____

_____

Review the condition reports from the previous inspection visits.

StormFilter Maintenance Report

Date: _____ Personnel: _____

Location: _____ System Size: _____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

List Safety Procedures and Equipment Used: _____

_____

_____

System Observations

Months in Service:

Oil in Forebay: Yes ☐ No ☐

Sediment Depth in Forebay: _____

Sediment Depth on Vault Floor: _____

Structural Damage: _____

Drainage Area Report

Excessive Oil Loading: Yes ☐ No ☐ Source: _____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: _____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: _____

StormFilter Cartridge Replacement Maintenance Activities

Remove Trash and Debris: Yes ☐ No ☐ Details: _____

Replace Cartridges: Yes ☐ No ☐ Details: _____

Sediment Removed: Yes ☐ No ☐ Details: _____

Quantity of Sediment Removed (estimate?):

Minor Structural Repairs: Yes ☐ No ☐ Details: _____

Residuals (debris, sediment) Disposal Methods: _____

Notes:

_____

_____

_____

_____

_____

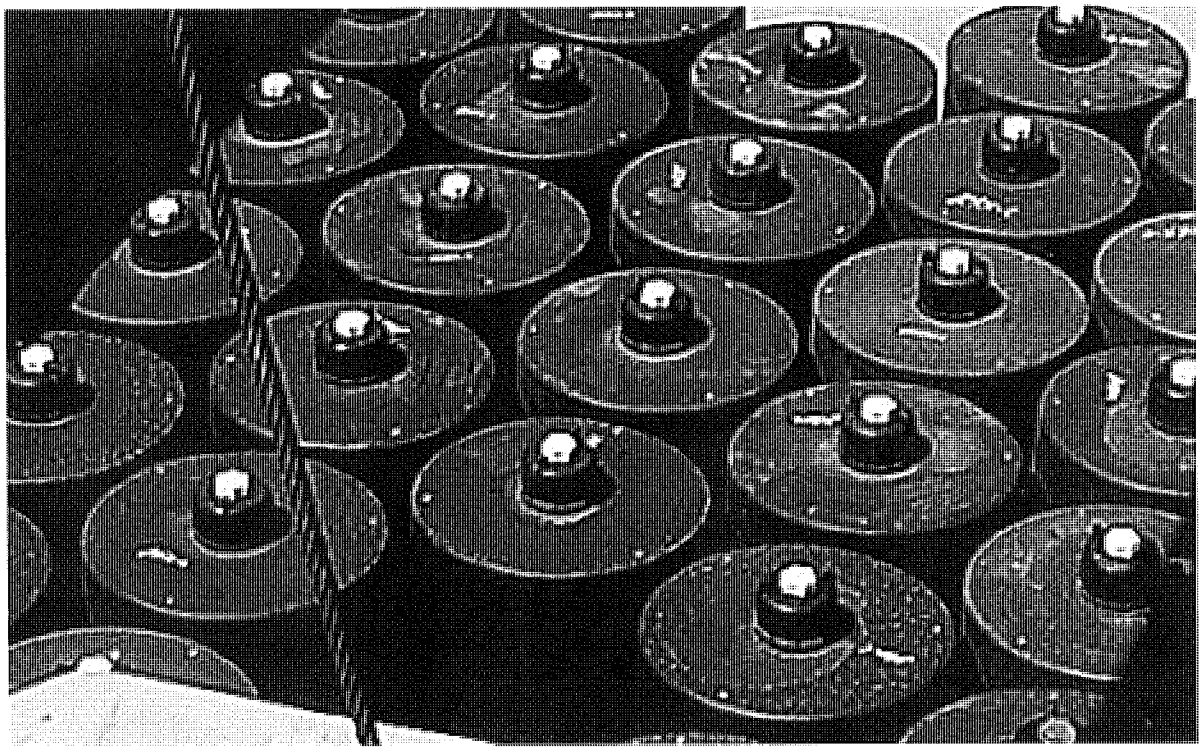
_____

_____

CONTECH®
CONSTRUCTION PRODUCTS INC.

StormFilter

Configuration Guide



The Stormwater Management
StormFilter®

The Stormwater Management StormFilter®

The Stormwater Management StormFilter® (StormFilter) is a passive, flow-through, stormwater filtration system. The system is comprised of one or more structures that house rechargeable, media-filled cartridges which trap particulates and adsorb materials such as dissolved metals, hydrocarbons, and nutrients in polluted runoff.

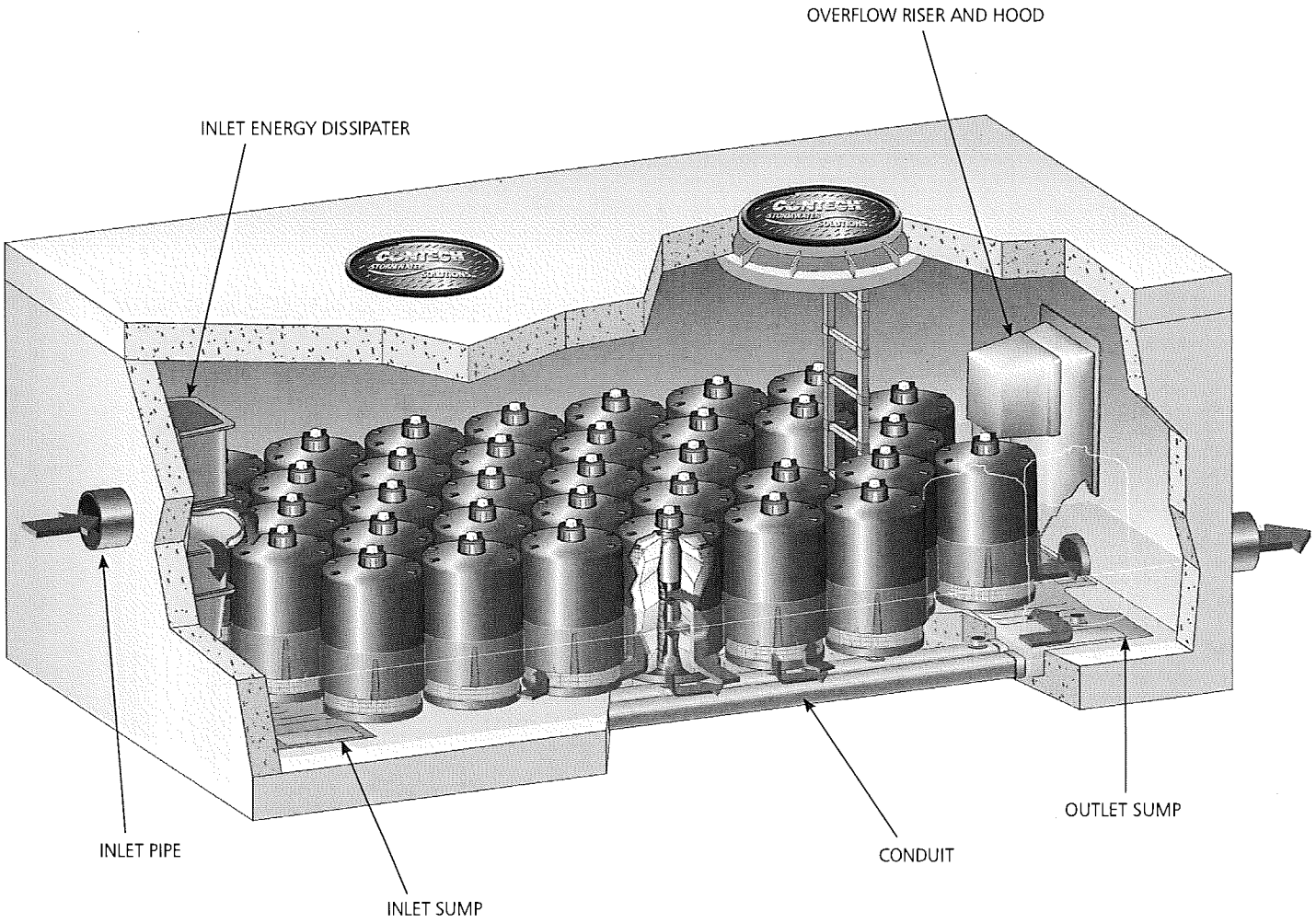
The StormFilter system comes in a variety of configurations and sizes to meet any site need. A variety of filter media is available and can be customized for each site to remove the desired pollutants.

Basic Design

The StormFilter is sized to treat the peak flow of a water quality design storm. The peak flow or WQv is determined from calculations based on the contributing watershed hydrology and from a design storm magnitude set by the local stormwater management agency. The StormFilter system is modular and each unit is designed with the number of cartridges required to meet the peak design flow rate, WQv or cap.

The flow rate through each filter cartridge is set to meet the jurisdictional performance requirements, allowing control over the amount of contact time between the influent and the filter media. The maximum flow rate through each cartridge can be adjusted, between 0.26 gpm/ft² and 2 gpm/ft² of surface area, using a calibrated restrictor disc at the base of each filter cartridge. Adjustments to the cartridge flow rate will affect the number of cartridges required to treat the peak flow or WQv.

Please contact your local CONTECH representative for site-specific design assistance.



Basic Operation

Priming System Function

The system is designed to siphon stormwater runoff through the StormFilter cartridge. Stormwater enters a StormFilter cartridge, percolates horizontally through the cartridge's filter media and collects in the center tube where the float valve is in a closed (downward) position.

As water passes through the filter media and into the cartridge's center tube, the air in the cartridge is displaced by the water and purged from beneath the filter hood through the one-way check valve located in the cap. Once the center tube is filled with water, there is enough buoyant force to open the float valve and allow the treated water in the center tube to flow into the under-drain manifold. This causes the check valve to close, initiating a siphon that draws polluted water throughout the full surface area and volume of the filter. Thus, the entire filter cartridge is used to filter water throughout the duration of the storm, regardless of the water surface elevation in the unit. This siphon continues until the water surface elevation drops to the elevation of the hood's scrubbing regulators, and the float returns to a closed position. Utilizing the hydraulic potential in the cartridge, the scrubbing regulators cause the filter surface to be clean of attached sediments thus extending the filter's operational life.

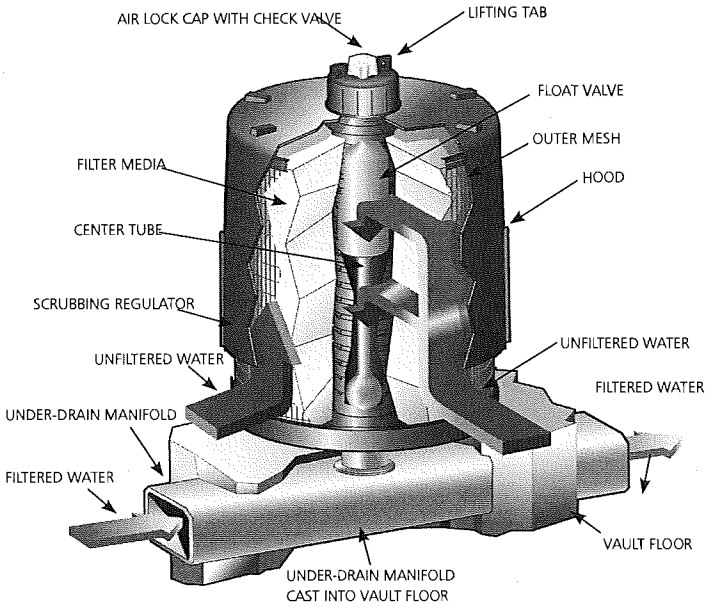
Flow and Valve Control

The filtration rate through a typical StormFilter cartridge can be adjusted so that it has a maximum flow rate of 2 gpm/ft² at the design driving head. The flow rate is individually controlled for each cartridge by a restrictor disc located at the connection point between the cartridge and the under-drain manifold. Consisting of a simple orifice disc of a specific diameter, the flow rate through the cartridges can be adjusted to a level that coincides with your treatment requirements by using a disc with the appropriate orifice diameter.

A reduction in flow rate affects the performance of the StormFilter system with regards to both sediment and soluble pollutants. For solids, Stokes' Law predicts the movement of sediment in a fluid and it has been proven that a reduction in the flow velocity through the system will facilitate increased settling and capture of sediments. In addition, some media types have the ability to remove soluble pollutants through chemical processes, like ion exchange. A reduction in the flow velocity through the StormFilter cartridge will increase the contact time between the stormwater and the media, thereby increasing the removal efficiency by increasing the time for a chemical process to take place.

Media type can be changed, but flow rate adjustment requires engineering consultation to ensure hydraulic demands are satisfied.

Through routine maintenance, a media filtration system can adjust the media type to target or update the system to treating specific pollutants, new TMDLs, or changing pollutants of concern. The media change out can provide a long-term solution to changing regulatory requirements.



StormFilter Configurations

The StormFilter technology can be configured to meet your unique site requirements.

Downstream Treatment Configurations

Conventional stormwater treatment involves collecting, conveying and treating stormwater runoff with an end of pipe treatment system before discharging off-site. StormFilter configurations suitable for these applications are listed below and can be engineered to treat a wide range of flows.

Vault/Manhole

The Vault/Manhole consists of one or more precast concrete structures ranging from 48" manholes to 8' x 24' vaults. The largest unit treats water quality design flows up to 3.75 cfs, and can be placed in series or in parallel to treat higher flows if needed.

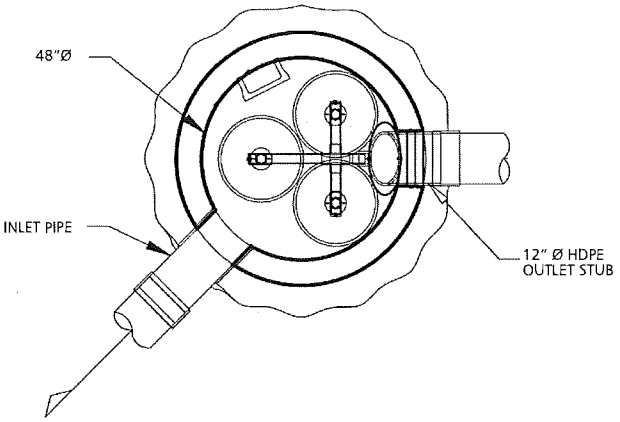
A Vault/Manhole configuration can be installed online or offline from storm system, where the unit has internal overflow bypass. These systems can also be installed offline, where high flows are bypassed around the treatment system and there is no internal overflow. However, if detention, pretreatment, or bypassing is required, it can be installed offline of the storm system.

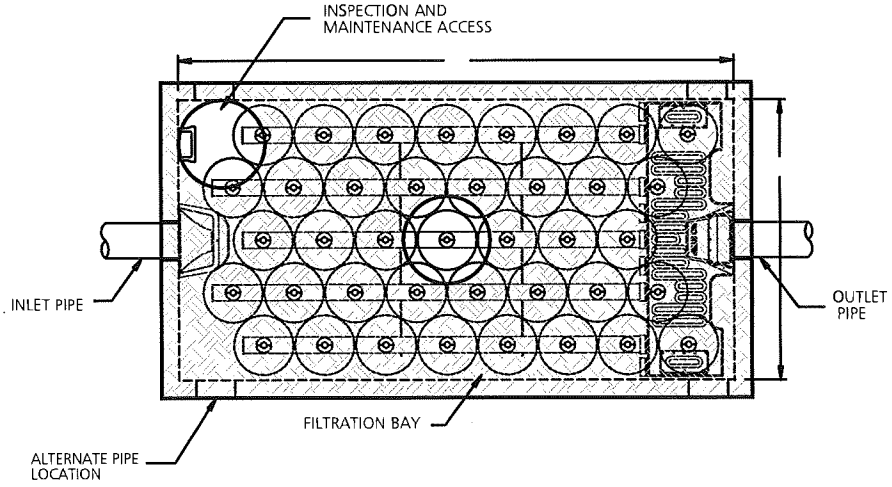
Basic Operation

Vault/Manhole systems are housed in either a vault or manhole. Stormwater first enters the structure through the inlet pipe where it is directed through the energy dissipator. This gently spreads the flow to minimize re-suspension of previously captured pollutants.

Once in the filtration area, the stormwater begins to pond and percolate horizontally through the media contained in the filter cartridges. After passing through the media, treated water that has collected in the cartridge center tube is directed into the outlet sump by an under-drain manifold. The treated water in the outlet sump is then discharged through the outlet pipe.

Precast StormFilter systems have an internal bypass capability from 1.0 cfs to 2.0 cfs, depending upon the size of the system. If peaks flows to the system exceed 2.0 cfs, an offline high flow bypass is needed.





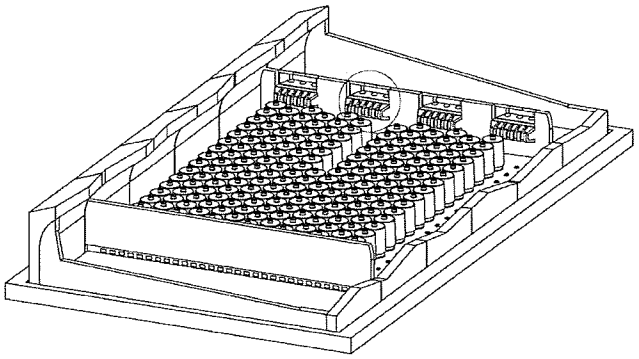
Vault/Manhole StormFilter

High Flow StormFilter

High Flow StormFilter systems can be designed within a variety of structures to meet local requirements and streamline installation. These systems are designed for large sites and large flows. Too big for standard precast structures, they are usually built from precast components that are assembled on site. The High Flow StormFilter is available in several configurations: CON/SPAN®, Panel Vaults, Box Culverts, or Cast-In-Place.

Basic Operation

The High Flow StormFilter design has the same basic configuration and components as the Precast StormFilter but operates on a larger scale.



High Flow StormFilter

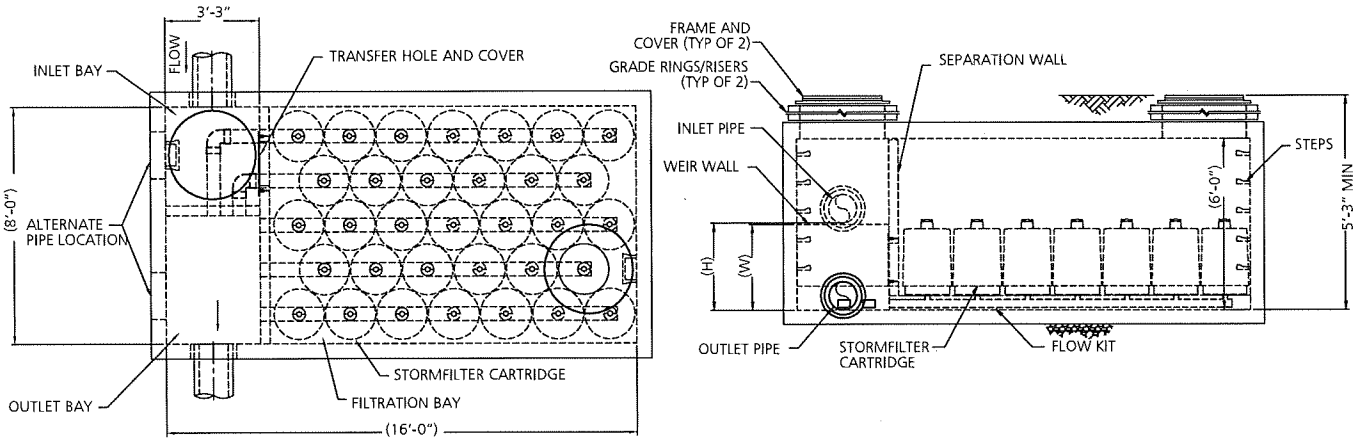
Peak Diversion StormFilter

The Peak Diversion StormFilter includes a treatment chamber and offline by-pass capability in one precast vault. Sizes range from 8'x11" to 8'x24" in most areas. Larger units can treat up to 2.5 cfs depending on cartridge height and the approved flow rate of regulatory jurisdiction. The integrated off-line bypass eliminates upstream flow splitters, downstream junction structures, and additional piping to save space and reduce the overall foot print. This lowers materials and installation cost while reducing potential conflicts with right of way (ROW) boundaries and utilities.

Basic Operation

Stormwater enters the structure through one or two inlet pipes into the inlet bay and low flows are directed to the filtration bay through a transfer opening. Once in the filtration area, the stormwater begins to pond and percolate horizontally through the media contained in the filter cartridges. After passing through the media, treated water that has collected in the cartridge center tube is directed into the outlet bay by an under-drain manifold. The treated water in the outlet sump is then discharged through the outlet pipe.

During large storm events greater than the treatment capacity, peak flows are diverted across the overflow weir directly to the outlet. Even during high flows the cartridges are still operating and water is entering the filtration bay from the inlet bay. This continuous flow into the filter bay helps ensure pollutants can not be washed out during high flow events.



Peak Diversion StormFilter

Volume StormFilter

The Volume StormFilter is designed to meet volume-based regulations where a specific water quality volume (WQv) must be captured and treated. In addition to the treatment, the structure can be sized to capture all or a portion of the WQv.

Restrictor discs inside each cartridge can be used to control the discharge rate from the system. The size of the disc is calibrated to provide the design filtration rate at a live storage depth. Because of these discs (and the airlock cap with a one way vent) water can be impounded above the cartridges in the treatment bay.

Structures range in size from a 48" manhole to CON/SPAN sections with a 24' x 10' cross section built to length. In many cases smaller structures are combined with outboard storage, such as pipe, to provide the WQv storage.

The Volume StormFilter can be designed with or without an internal bypass. If peak flows to the system exceed the internal bypass, or external bypass. If peak flows to the system exceed the internal bypass, or external bypass is required, a high flow bypass is needed. The system can also be installed online or offline and uses a traffic-bearing lid.

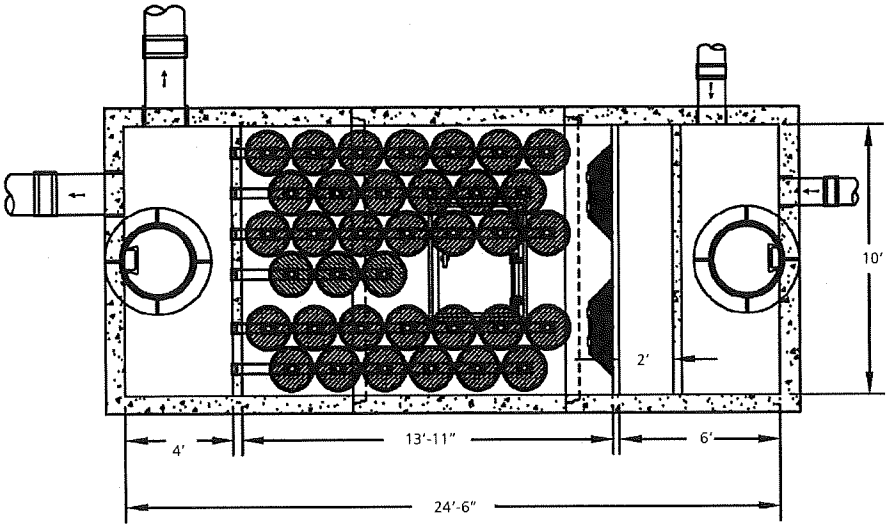
Basic Operation

The Volume StormFilter is typically configured in one of two ways.

A three bay system that incorporates internal storage for the WQv and includes: the storage bay, the filtration bay, and the outlet bay. Water first enters the storage bay (a portion of which includes dead storage) which facilitates pretreatment (gravity separation) and storage of the WQv. The stormwater is then directed into the filtration bay for full treatment and additional storage. The storage bay can be designed with a baffle to trap floatables, oils, and surface scum. Cartridges in the filtration bay treat the stormwater and control the discharge rate. Once in the filtration bay, the stormwater percolates horizontally through the media contained in the filter cartridges. After passing through the cartridge, treated water is directed to the outlet bay by an under-drain manifold where it is discharged through an outlet pipe.

A two bay, precast vault bases system similar to the Vault StormFilter where pretreatment and live storage are provided upstream.

Providing WQv storage in an outboard storage facility such as storage pipe provides the versatility to meet most footprint and elevation requirements.



Volume StormFilter

Upstream Treatment Configurations

Low Impact Design (LID) involves managing runoff close to the source using small, decentralized system. The following suite of StormFilter configurations are easily incorporated on sites where LID site design is recommended. These low-cost, lowdrop, point-of-entry systems also work well when you have a compact drainage area.

CatchBasin StormFilter

The CatchBasin StormFilter (CBSF) consists of a multi-chamber steel, concrete, or plastic catch basin unit that contains up to four StormFilter cartridges. The steel CBSF is offered both as a standard and as a deep unit.

The CBSF is installed flush with the finished grade and is applicable for small drainage areas from roadways and parking lots, and retrofit applications. It can also be fitted with an inlet pipe for roof leaders or similar applications.

The CBSF unit treats water quality design flows up to 0.20 cfs, coupled with an internal weir overflow capacity of 1.0 cfs for the standard steel and concrete units and 1.8 cfs for the deep steel units. Non-traffic rated plastic CBSF units have an internal weir overflow capacity of 0.5 cfs.

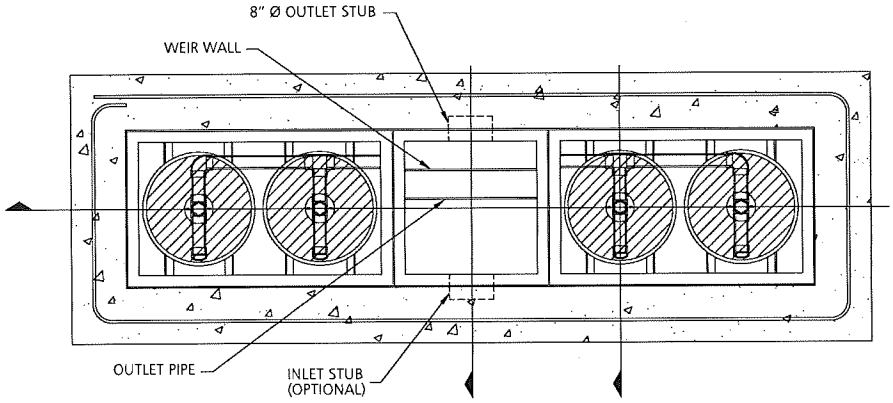
Basic Operation

The CBSF acts as the primary receiver of runoff, similar to a standard, grated catch basin. The steel and concrete CBSF units each have an H-20 rated, traffic-bearing lid that allows the filter to be installed in parking lots and take up no land area. Plastic CBSF units can be used in landscaped areas and for other non-traffic bearing applications.

The CBSF consists of a sumped inlet chamber and cartridge chamber(s). Runoff enters the sumped inlet chamber either by sheet flow from a paved surface or from an inlet pipe discharging directly to the unit. The inlet chamber's internal baffle traps debris and floating oil, and houses an overflow weir. Heavier solids settle into the deep sump, while lighter solids and soluble pollutants are directed under the baffle and into the cartridge chamber through a port between the baffle and the overflow weir. Once in the cartridge chamber, polluted water ponds and percolates horizontally through the media in the filter cartridges. Treated water collects in the cartridge's center tube from where it is directed by an under-drain manifold to the outlet pipe on the downstream side of the overflow weir and discharged.

When flows into the CBSF exceed the water quality design value, excess water spills over the overflow weir, bypassing the cartridge bay, and discharges to the outlet pipe.

The CBSF is particularly useful where small flows are being treated or for sites that are flat and have little available hydraulic head to spare. The unit is ideal for applications in which standard catch basins are to be used. Both water quality and catchment issues can be resolved with the use of the CBSF.



CatchBasin StormFilter

Curb Inlet StormFilter

The Curb Inlet StormFilter consists of a precast concrete vault ranging from 6'x8' to 8'x16' in size. These units can treat water quality design flows up to 1.2 cfs. The system is installed online and includes an internal offline overflow bypass around the filtration chamber. The internal bypass capability is based on depth of the structure. The standard bypass capacity is 15 cfs but is larger for deeper units. A traffic-bearing lid is placed underneath the median or sidewalk adjacent to the roadway.

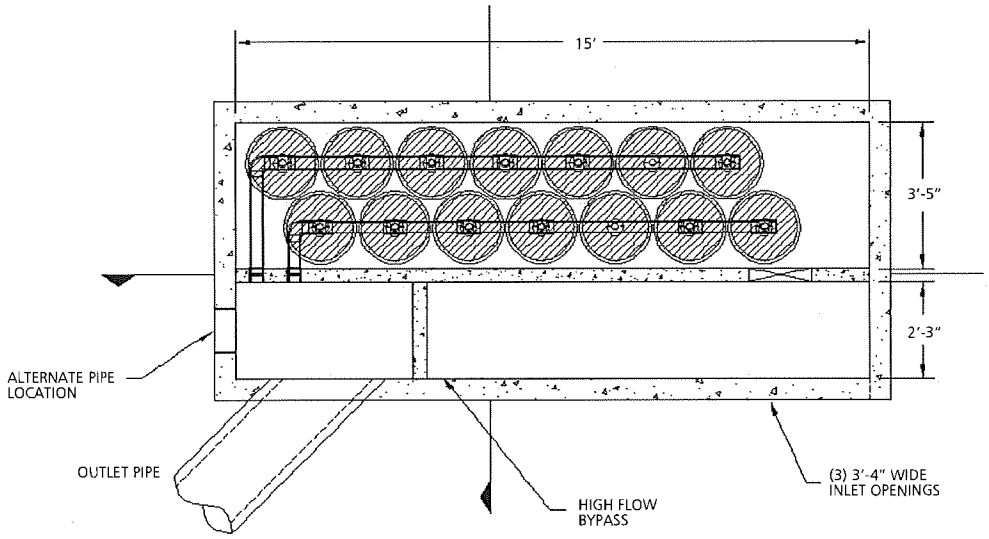
Basic Operation

The Curb Inlet StormFilter is composed of three bays: the inlet bay, the filtration bay, and the outlet bay. Stormwater enters the inlet bay through the curb inlet opening. The design flow is directed through a transfer opening to the filtration bay for full treatment.

Once in the filtration bay, the stormwater percolates horizontally through the media in the filter cartridges to the center tube. Treated water in the cartridge center tube is directed into the outlet bay by an under-drain manifold and discharged through the outlet pipe. Outlet pipes can be placed parallel, perpendicular, or up to 45° to the roadway. Overflow is directed over a weir wall between the inlet bay and the outlet bay, bypassing the filtration bay leaving accumulated pollutants undisturbed.

Curb Inlet Openings

Every Curb Inlet StormFilter is designed to meet local regulations governing the geometry of the curb inlet. This can be accomplished in two ways. One way is with an integrated face plate – the vault lid includes the face plate which is tied into the curb. Another way is with a cast-in-place face plate – the entire face plate is constructed by the contractor pouring the curb. Curb inlet openings can be 4', 7', or 10' in length.



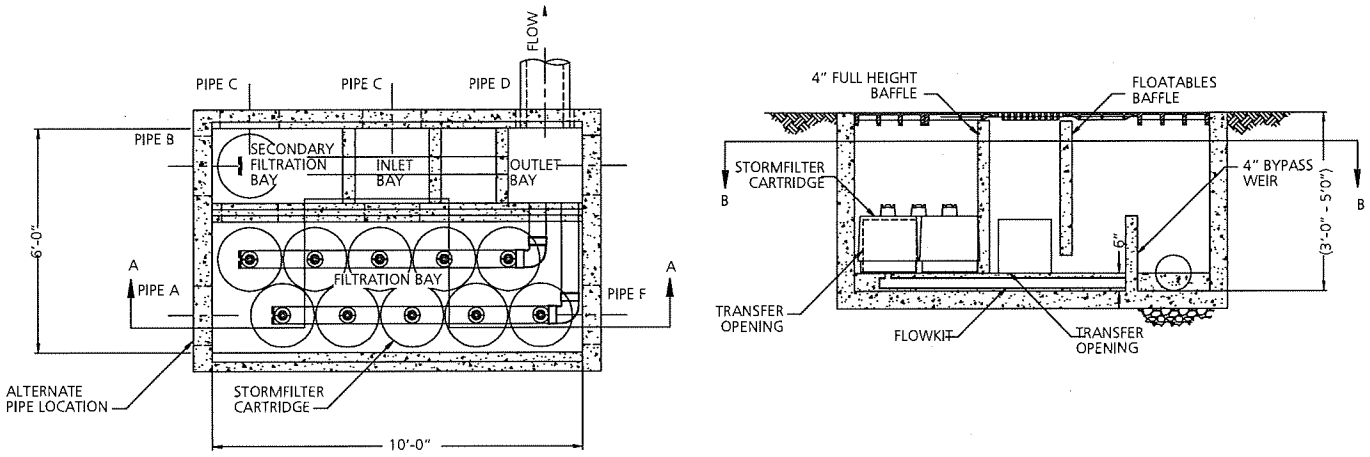
Curb Inlet StormFilter

Linear Grate StormFilter

The Linear Grate StormFilter is a precast vault that acts as the primary receiver of runoff, similar to a standard grated catch basin. The unit has H-20 rated traffic bearing lids that allow the filter to be installed under parking lots. The system consists of an inlet bay, filtration bay, and an outlet bay. Providing treatment as it enters the conveyance system reduces the overall head loss because the vertical drop from the finished grade into the conveyance system is also used to provide hydraulic pressure on the filter cartridges.

Basic Operation

Runoff enters the inlet bay by sheet flow from a paved surface or from an inlet pipe discharging directly to the unit. The inlet bay's internal baffle traps debris and floating oil and denser pollutants are directed into the filtration bay. Once in the cartridge chamber, polluted water ponds and percolates through a radial media filter cartridge. Treated water collects in the cartridge's center tube where it is directed by an underdrain manifold to the outlet pipe on the downstream side of the overflow weir. When flow rates exceed the water quality design value, excess water spills across the overflow weir, bypassing the cartridge bay and proceed directly to the outlet pipe. The integrated offline bypass ensures pollutants captured in the filtration bay are not washed downstream during peak flow events.



Linear Grate StormFilter

Grated Inlet Openings

The number of inlet grates and the size of the inlet bay are designed to capture the peak flow rates from the drainage area. The remaining area is devoted to the filtration bay and the outlet bay which are covered with removable plates for access during maintenance. The entire inlet bay, filtration bay, and outlet bay can be opened at one time allowing full access. In many cases, due to the shallow nature of the design, confined space entry is not required for maintenance.

Linear StormFilter

The Linear StormFilter consists of one or two precast concrete channels that are 10' or 20' in length and 2' 9" in width.

The Linear StormFilter is installed flush with the finished grade, functioning similar to a catch basin or trench drain. The top of the unit has either covers or doors for easy access. The Linear StormFilter is typically installed online like the precast StormFilter.

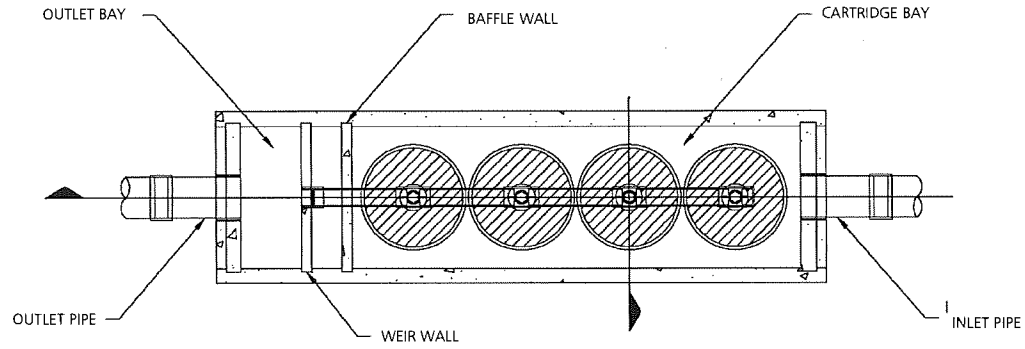
The Linear StormFilter unit treats water quality design flows up to 0.27 cfs.

Basic Operation

The Linear StormFilter can be installed either as the primary receiver of runoff, similar to a grated catch basin, or with an inlet stub and doors to receive runoff collected upstream.

The system is equipped with an internal overflow weir to ensure that there is no local flooding for storm events in excess of the design treatment flow. Maintenance costs for the unit are typically less because there are no confined space entry requirements, and access is quick and easy.

The Linear StormFilter is particularly useful where small flows are being treated or where the site is very flat and there is little available hydraulic head to spare.



Linear StormFilter

Infiltration Configuration

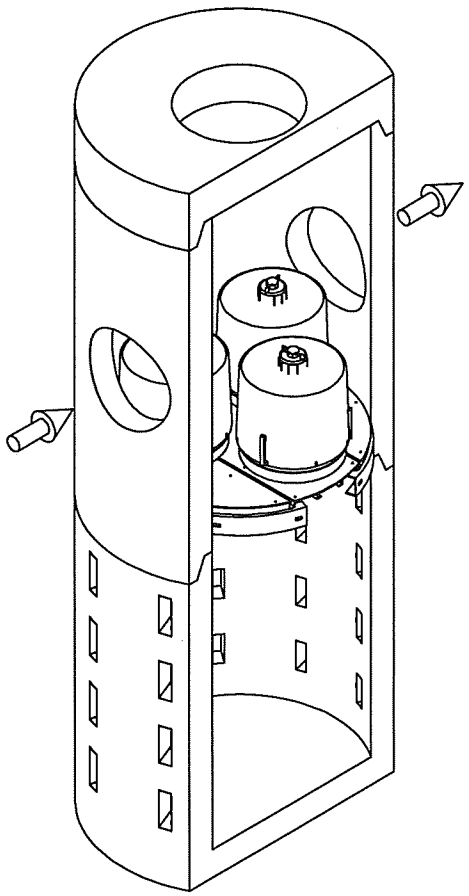
Dry Well StormFilter

The Dry Well StormFilter provides treatment, infiltration and groundwater protection in a single structure. The system is designed to treat conveyed flow or sheet flow from small drainages. Multiple units can be installed to treat any size site. Because it provides treatment and infiltration in a single unit, the total number of structures and the amount of pipe required for the stormwater system are reduced.

The Dry Well StormFilter system is available in 48", 60" and 72-" pre-cast manhole top sections that are designed to be stacked on top of dry well infiltration risers. The StormFilter portion of the unit arrives fully assembled and ready to install, including an integrated concrete deck for the StormFilter cartridges. The system can also be retrofitted into existing 48" manhole dry wells.

Basic Operation

Stormwater enters the dry well unit through one or more entry pipes or channels at its top. It then percolates through the media in the StormFilter cartridge to the center tube. Treated water in the cartridge center tube is discharged to the infiltration section below, and then infiltrates into the surrounding soils through a number of small exit openings at the sides and bottom.



DryWell StormFilter

Roof Runoff Treatment Configuration

Downspout StormFilter

The Downspout StormFilter is an aboveground configuration that can be easily integrated into existing gutter systems to eliminate pollution from rooftop runoff. It typically occupies 2.5' x 5' footprint, and can fit most downspout configurations and sizes. Each unit holds two StormFilter cartridges, and single- and dual-stage options are available. It treats up to 14,000 square feet of rooftop area per dual-cartridge system.

StormFilter Cartridges

There are three cartridge heights available for StormFilter systems: 27", 18", and Low Drop. The most economical is the 27" tall cartridge. It can treat the highest flow rate per cartridge, which creates the smallest system with the lowest installed cost. The 27" cartridge requires 3.05' of driving head to operate. For sites with less driving head available, the 18" cartridge is the next best option. Lower flow rates per cartridge increase the footprint of the overall system but only 2.3' of driving head is required. For sites with very limited drop, the Low Drop cartridge only requires 1.8" of driving head.

Cartridge Flow Rates

Cartridge Type	Hydraulic Drop	Treatment Capacity (gpm)	
		1 gpm/ft2	2 gpm/ft2
StormFilter 27"	3.05'	11.25	22.5
StormFilter 18"	2.30'	7.5	15
StormFilter Low Drop	1.80'	5	10

StormFilter Media

The removal of site-specific pollutants can be maximized with the variety of filtration media available. In many cases, different media types can be combined so as to target a wide spectrum of pollutants. This ability to combine and use various media types allows the system to be easily adjusted to meet ever-changing site conditions and increasingly stringent regulatory requirements.

PhosphoSorb™

PhosphoSorb, a lightweight media comprised of Perlite (a heat-expanded volcanic rock) and activated alumina, removes total phosphorus (TP) by absorbing dissolved-P and filtering particulate-P simultaneously. The Perlite provides the capability to remove suspended solids while the activated alumina absorbs soluble phosphorus absorption.

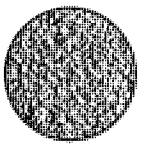
PhosphoSorb is composed of a slightly finer gradation than the field proven ZPG™ (Zeolite, Perlite, Granular Activated Carbon) media and will provide equivalent - or even better - removal of suspended solids. Initial field tests have indicated an increase in the TSS removal efficiency up to 10% over the field-proven ZPG media. The StormFilter with ZPG media has already received a General Use Level Designation for basic treatment in the State of Washington.

Perlite

Perlite is a natural, volcanic ash, similar in composition to glass and similar in appearance to pumice. To use perlite as a filter medium, it must first go through a heating process to yield a lightweight, multicellular, expanded form. This expanded form has a coarse texture, very low-density, high surface area, and stable, inert chemistry, all of which make perlite an excellent physical filtration medium.

Perlite has proven to be our media of choice for sediment and oil removal. The multicellular nature of expanded perlite is the key to its excellent ability to trap sediments and adsorb oil. The coarse texture of the expanded perlite creates a bed of material with a very high porosity, which allows perlite to have the highest sediment and oil storage capacity of all of the available media options.

Zeolite

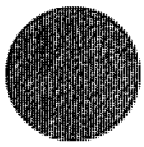


The term zeolite defines a family of both natural and synthetic, hydrous aluminosilicate materials with a highly porous mineral matrix that holds light, alkali metal cations (ideally sodium ions).

Zeolite has the ability to use a cation exchange reaction that removes other cations such as zinc, copper, lead, and ammonia from water. In the cation exchange reaction, the light metal cations in the zeolite matrix are displaced by the heavier metal cations, such as copper, in the water.

The zeolite used in our system is clinoptilolite, which has a cation exchange capacity (CEC) of approximately 100 to 220 meq/100 g. Clinoptilolite has inert characteristics that make it an excellent metals removal media option when CSF media cannot be used. It can be combined with other media such as GAC and perlite when metals are not of exclusive concern.

CSF® Leaf Media



CSF Leaf Media is a patented filtration media composed of composted deciduous leaves originating from the City of Portland, Oregon. CONTECH Stormwater Solutions purchases the mature, stable, deciduous leaf compost and then processes it into an odorless, pelletized compost product with physical and chemical characteristics desirable for stormwater filtration.

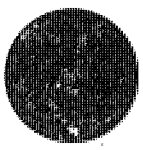
The patented compost process creates a material with excellent flow-through characteristics and stability in water. Not only do CSF Leaf Media consist of 100% recycled, all natural materials, but it also provides good removal of sediments and excellent removal of a wide range of toxic contaminants.

CSF Leaf Media provides the multitude of beneficial water treatment properties typical of soil in a form that is compatible with the compact, modular, media-based design of the StormFilter system. In addition to the physical filtration provided by the granular nature of the CSF Leaf Media, the complex chemistry of the compost also provides chemical filtration as well.

Sediment and total nutrients are removed through physical filtration. Oil, complexed metals, and anthropogenic organic contaminants such as herbicides and pesticides are removed through adsorption, the physical partitioning of organic compounds, such as pesticides, to carbon-rich materials, such as the compost.

Soluble metals are removed by cation exchange, as well as by complexation of metal ions to the organic chelating agents present in compost. CSF Leaf Media is an excellent, cost-effective, all-purpose media that epitomizes the potential value of recycled materials.

GAC



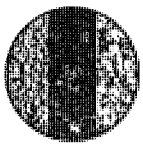
GAC (Granular Activated Carbon) is a widely accepted water filtration media used for the removal of organic compounds. It consists of pure carbon (originating from coal or charcoal) whose micro-porous structure has been enhanced through steam or acid "activation."

The high carbon content and porous nature of GAC accounts for its excellent ability to remove organic compounds through adsorption. Since adsorption is the physical partitioning of organic compounds to high carbon surfaces, the "activation" of the carbon (which creates GAC) endows it with an enormous surface area upon which adsorption can take place.

In situations where anthropogenic organic contaminants are of exclusive concern, GAC media provide the highest level of stormwater treatment compared to other available media options. However, because it is not very often the case that anthropogenic organic contaminants are of exclusive concern, GAC is usually combined with another media such as perlite or zeolite for the treatment of additional contaminants.

Combination of GAC with perlite constitutes the most cost-effective configuration, as the effectiveness of GAC is drastically reduced if it is coated with high concentrations of heavy oil or sediment, which can restrict access via surface pores to the interior of the GAC granules.

ZPG™ (Zeolite, Perlite, GAC blend)



This proprietary blend of zeolite, perlite, and granular activated carbon media is used to provide an alternative for CSF media for installations where leaf media cannot be used.

Laboratory and Field Testing

The StormFilter system is designed to meet the most stringent regulatory requirements. The field-proven performance of the StormFilter has led to hundreds of regulatory agency approvals nationwide as a standalone BMP.

The Stormwater Management StormFilter® is the first manufactured BMP to receive stand-alone approval through field testing and satisfying the total suspended solids treatment requirements in Washington and New Jersey.

Log on to www.contechstormwater.com/stormfilter to view the following reports in full.

Field Monitoring Reports

Field Proven Performance of the StormFilter using the Technology Assessment Protocol - Ecology (TAPE) and Technology Acceptance Reciprocity Partnership (TARP) Tier II Protocol

1. Washington
   a. Washington State Department of Ecology General Use Level Designation for Basic Treatment
   b. Technical Evaluator Engineering Report (TEER). Gary Minton, Ph.D., P.E.
2. New Jersey
   a. New Jersey State Department of Environmental Protection Final Certification
   b. New Jersey Corporation for Advanced Technology (NJCAT) Field Verification Report

Laboratory Reports

Total Suspended Solids (TSS) Removal Using Different Particle Size Distributions with the Stormwater Management StormFilter.

Influences on TSS removal efficiency

Influence of analytical method, data summarization method, and particle size on total suspended solids (TSS) removal efficiency of the StormFilter

StormFilter removal efficiency with coarse/fine perlite media

Evaluation of the removal of silt loam TSS using coarse/fine perlite at 28 L/min (7.5 gpm).

StormFilter removal efficiency with ZPG media

Evaluation of the removal of SIL-CO-SIL 106 using ZPG media at 28 L/min (7.5 gpm)

StormFilter removal efficiency with coarse perlite

Evaluation of the removal of sandy loam TSS using coarse perlite at 57 L/min (15 gpm)

Support

- Drawings and specifications are available at contechstormwater.com.
- Site-specific design support is available from CONTECH Stormwater Design Engineers.

CONTECH Construction Products Inc. provides site solutions for the civil engineering industry. CONTECH's portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products. For information on other CONTECH division offerings, visit contech-cpi.com or call 800.338.1122

The product(s) described may be protected by one or more of the following US patents: 5,322,629; 5,624,576; 5,707,527; 5,759,415; 5,788,848; 5,985,157; 6,027,639; 6,350,374; 6,406,218; 6,641,720; 6,511,595; 6,649,048; 6,991,114; 6,998,038; 7,186,058; 7,296,692; 7,297,266; related foreign patents or other patents pending.

CONTECH CONSTRUCTION PRODUCTS INC.

RECYCLED PAPER

After recording return to:

_____
_____
_____
_____

MAINTENANCE COVENANT AND ACCESS EASEMENT

THIS MAINTENANCE COVENANT AND ACCESS EASEMENT ("Agreement") is made this ____ day of _____, 1999, between _____, a _____ ("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 _____ (the "Development").

B. The City's Community Development Department ("CDD") has approved construction plans submitted by Developer for the Development. The Development contains on-site stormwater facilities as described in the approved construction plans (together with any other stormwater facilities that may hereafter be constructed on the Development, the "Stormwater Facilities").

C. To protect future lot owners in the Development, owners of neighboring property, and their property, CDD has required that Developer enter into this Agreement as a condition to CDD's approval of construction plans and the final plat for the Development.

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 CDD or the City and including the City's Stormwater and Grading Design Standards). Developer shall notify CDD 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.

2. **Failure to Perform Covenant; Easement.** If the City determines that Developer is not in compliance with the covenant described in Section 1, except in the case of emergency, the City or its designee shall give the Developer Designee 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, Developer hereby grants to the City, CDD, their employees, independent contractors and designees the right to enter the Development to perform any and all work required to bring the Stormwater Facilities into compliance with Section 1.

If the City determines that Developer is not in compliance with the covenant in Section 1 and determines that there exists or will likely exist an emergency on or about the Development with respect to the Stormwater Facilities, Developer hereby grants to the City, CDD, their employees, independent contractors and designees the right to enter the Development to perform any and all work required to bring the Stormwater Facilities into compliance with Section 1, and in such case the City shall use reasonable efforts to notify the Developer Designee prior to entering the Development. Notwithstanding the above, the work performed may consist only of cleaning and repairing the Stormwater Facilities to their original condition and standards.

Developer hereby grants the City, CDD, their employees, independent contractors and designees a nonexclusive easement for ingress and egress over, across and under the Development for the purposes described above in this Section 2 and from time to time at the City's sole discretion to inspect, sample, and monitor components of the Stormwater Facilities and discharges therefrom.

DEVELOPER, FOR ITSELF AND ITS SUCCESSORS AND ASSIGNS (INCLUDING ALL OWNERS OF LOTS IN THE DEVELOPMENT), AGREES THAT NONE OF THE CITY, CDD, THEIR EMPLOYEES, INDEPENDENT CONTRACTORS AND/OR DESIGNEES SHALL HAVE ANY OBLIGATION TO EXERCISE THEIR RIGHTS UNDER THIS SECTION 2 OR TO PERFORM ANY MAINTENANCE OR REPAIR OF THE STORMWATER FACILITIES, AND THAT NONE OF THEM 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.

3. **Reimbursement**. If the City exercises its right to enter the Development pursuant to Section 2 (to include inspection, sampling, and monitoring), 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 a per annum rate equal to the prime rate of U.S. Bank (or its successor) plus five percent (5%). 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 this Section 3.

4. **Indemnification**. Developer agrees to indemnify, defend (with legal counsel reasonably acceptable to the City), and hold harmless the City, CDD, their 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, CDD, or their employees, independent contractors or designees of their rights under Section 2.

5. **Run with the Land**. The parties' rights and obligations contained herein shall run with the land and inure to the benefit of, and shall be binding upon, the City and Developer and their respective successors and assigns (including, without limitation, subsequent owners of lots in the Development and any homeowner's association owning common areas in the Development).

6. **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.

7. **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.

8. **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.

DEVELOPER:

_____

By: _____
Its: _____

THE CITY:

CITY OF OREGON CITY

By: _____
Title: _____

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 _____

STATE OF OREGON)
) ss.
County of Clackamas)

This instrument was acknowledged before me on _____ by _____.

_____
Notary Public for _____
My Commission Expires _____

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Clackamas County Area, Oregon

Beavercreek Live/Work

January 7, 2014

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface.....2
How Soil Surveys Are Made.....5
Soil Map.....7
Soil Map.....8
Legend.....9
Map Unit Legend.....10
Map Unit Descriptions.....10
Clackamas County Area, Oregon.....12
45B—Jory silty clay loam, 2 to 8 percent slopes.....12
References.....13
Glossary.....15

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:2,180 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 30 60 120 180

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 7, Aug 20, 2012

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 8, 2010—Sep 4, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Clackamas County Area, Oregon (OR610)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
45B	Jory silty clay loam, 2 to 8 percent slopes	11.0	100.0%
Totals for Area of Interest		**11.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Clackamas County Area, Oregon

45B—Jory silty clay loam, 2 to 8 percent slopes

Map Unit Setting

Elevation: 250 to 1,200 feet
Mean annual precipitation: 50 to 60 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Jory and similar soils: 90 percent

Description of Jory

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.1 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability classification (irrigated): 2e
Land capability (nonirrigated): 2e
Hydrologic Soil Group: C

Typical profile

0 to 13 inches: Silty clay loam
13 to 60 inches: Silty clay

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://soils.usda.gov/

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://soils.usda.gov/

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://soils.usda.gov/

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.glti.nrcs.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://soils.usda.gov/

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

Oregon City Live/Work

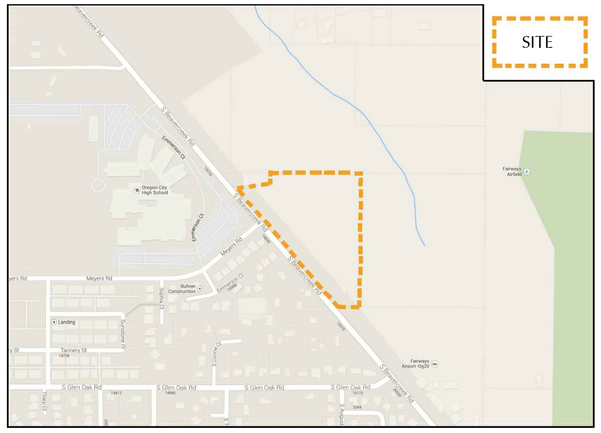
A 183-Unit Live/Work Apartment and Townhome Development

Oregon City, Oregon

Evergreen Housing Development Group

PROJECT TEAM

Owner/Developer	Evergreen Housing Development Group 600 University Street, Suite 1708 Seattle, WA 986101 (206) 535-6248
Architect:	Milbrandt Architects, P.C. 25 Central Way Suite 210 Kirkland, WA 98033 (425) 454-7130
Civil Engineer:	Pace Engineering 5000 Meadows Road Lake Oswego, OR 97035 (503) 597-3222
Landscape Architect:	Shapiro Didway Landscape Architects 1204 SE Water Avenue Portland, OR 97214 (503) 232-0520



VICINITY MAP
N.I.S.

LIST OF DRAWINGS

Cover	Cover Sheet	
A1	Architectural Site Plan	
A2	Typical Apartment Building	First Floor Plan
A3	Typical Apartment Building	Upper Floor Plan
A4	6-Plex Townhome Building	Floor Plans
A5	4-Plex Townhome Building	Floor Plans
A6	3-Plex Townhome Buildings	Floor Plans
A7	Building C1	Floor Plans
A8	Community Center	Floor Plans
E1	Typical Apartment Building	Exterior Elevations
E2	Typical Apartment Building	Exterior Elevations
E3	6-Plex Townhome Building	Exterior Elevations
E4	4-Plex Townhome Building	Exterior Elevations
E5	3-Plex Townhome Buildings	Exterior Elevations
E6	Building C1	Exterior Elevations
E7	Building C1	Exterior Elevations
E8	Community Center	Exterior Elevations
C1	Site Plan	
C2	Grading Plan	
C3	Storm Drainage Plan	
C4	Water and Sewer Plan	
L101	Landscape Plan - Section 1	
L102	Landscape Plan - Section 2	
L103	Landscape Plan - Section 3	
L201	Landscape Details	

Parking Calculation

Unit Type	Quantity	Min. Parking Ratio	Max. Parking Ratio	Min. Stalls	Max. Stalls
Studio Live/Work Stacked Flat Units	11	1	1.5	11	16.5
1-Bed/1-Bath Stacked Flat Units	58	1.25	2	72.5	116
2-Bed/2-Bath Live/Work Stacked Flat Units	15	1.5	2	22.5	30
2-Bed/2-Bath Stacked Flat Units	47	1.5	2	70.5	94
3-Bed/2-Bath Stacked Flat Units	10	1.75	2.5	17.5	25
5-Bed/5-Bath Stacked Flat Units	6	3	5	18	30
Total Stacked Flat Apartment Units	147			212	311.5
3-Bed/2-Bath Live/Work Towhomes	36	1.75	2.5	63	90
				min	max
Total Units on Site	183		total parking	275	401.5

H: \12-39\PRESENTATION\COVER.DWG

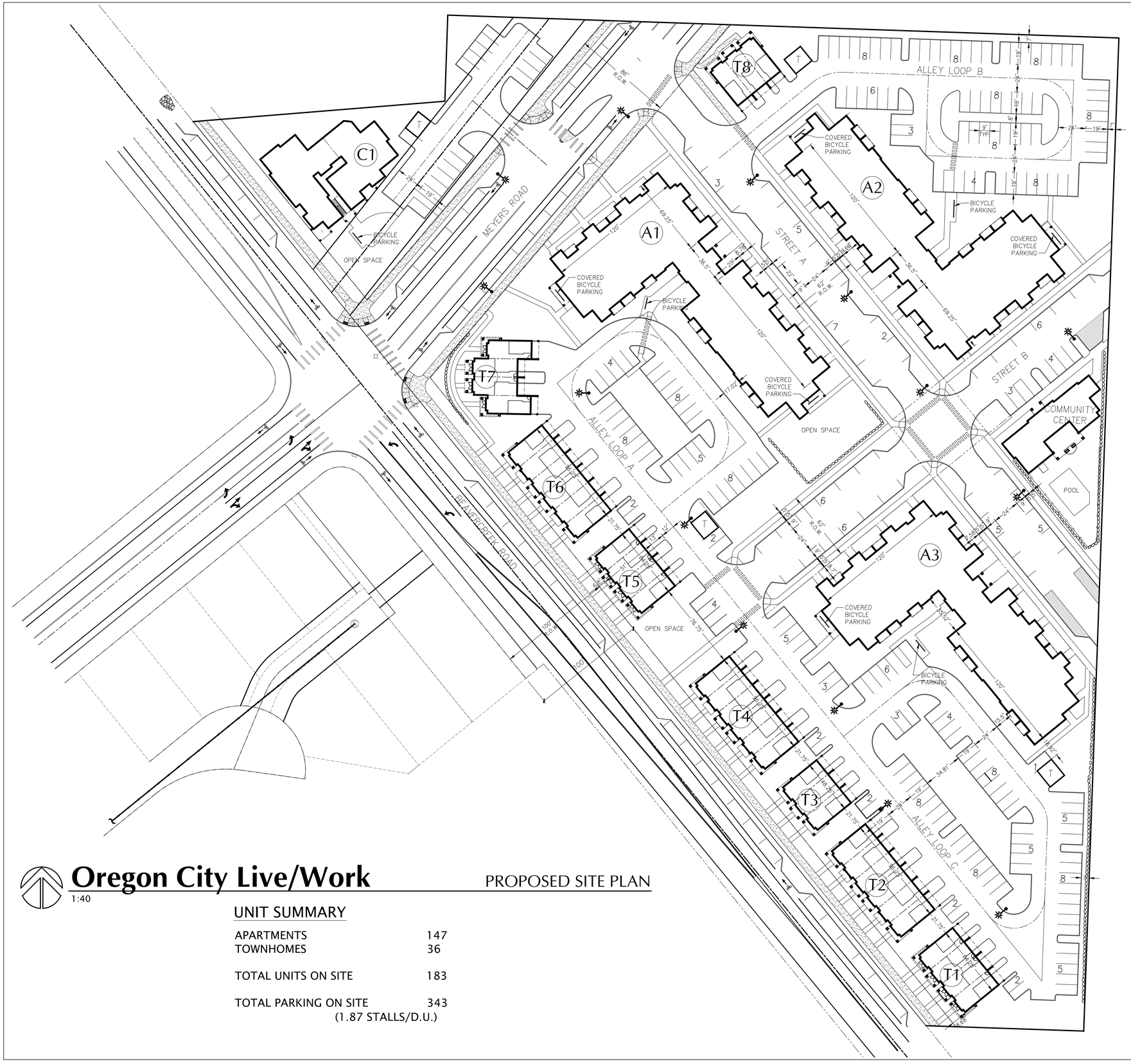
Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work
A Live/Work Apartment and Townhome Community
Oregon City, Oregon
Evergreen Housing Development Group

Cover Sheet

Scale:	Drawn By:	Date:	Date Plotted:
NTS	APT	01-14-14	1-13-14

Sheet No.: **COVER**
Job No.: **12-39**



Oregon City Live/Work

1:40

PROPOSED SITE PLAN

UNIT SUMMARY

APARTMENTS	147
TOWNHOMES	36
TOTAL UNITS ON SITE	183
TOTAL PARKING ON SITE	343
(1.87 STALLS/D.U.)	

SITE BREAKDOWN

BLOCK A1

PROPOSED APARTMENT UNITS (GROUND FLOOR LIVE/WORK UNITS)	48
PROPOSED LIVE/WORK TOWNHOME UNITS	14
TOTAL UNITS BLOCK A1	62

PROPOSED PARKING	
OPEN STALLS	48
GARAGES	14
APRONS	13
ASSIGNABLE PARKING: 75 (1.21/D.U.)	
ON-STREET PARALLEL	24
TOTAL AVAILABLE: PARKING	99 (1.60/D.U.)

BLOCK A2

PROPOSED APARTMENT UNITS (GROUND FLOOR LIVE/WORK UNITS)	48
PROPOSED LIVE/WORK TOWNHOME UNITS	3
TOTAL UNITS BLOCK A1	51

PROPOSED PARKING	
OPEN STALLS	69
GARAGES	3
APRONS	0
ASSIGNABLE PARKING: 72 (1.41/D.U.)	
ON-STREET PARALLEL	13
TOTAL AVAILABLE: PARKING	85 (1.67/D.U.)

BLOCK A3

PROPOSED APARTMENT UNITS (GROUND FLOOR LIVE/WORK UNITS)	45
PROPOSED LIVE/WORK TOWNHOME UNITS	19
TOTAL UNITS BLOCK A1	64

PROPOSED PARKING	
OPEN STALLS	72
GARAGES	19
APRONS	19
ASSIGNABLE PARKING: 110 (1.72/D.U.)	
ON-STREET PARALLEL	11
TOTAL AVAILABLE: PARKING	121 (1.89/D.U.)

COMMUNITY CENTER

ON-STREET HEAD-IN PARKING	7
ON-STREET PARALLEL	5
TOTAL AVAILABLE:	12

BLOCK C1

PROPOSED APARTMENT UNITS (5-BED UNITS)	6

PROPOSED PARKING	
OPEN STALLS	17
ASSIGNABLE PARKING:	17 (2.83/D.U.)
ON-STREET PARALLEL	9
TOTAL AVAILABLE: PARKING	26 (4.33/D.U.)

Milbrandt Architects
25 Central Way, Suite 210
Kirkland, Washington 98033
P: 425.454.7130 F: 425.658.1208
Web: www.milbrandtarch.com

No.	Date

Site Plan

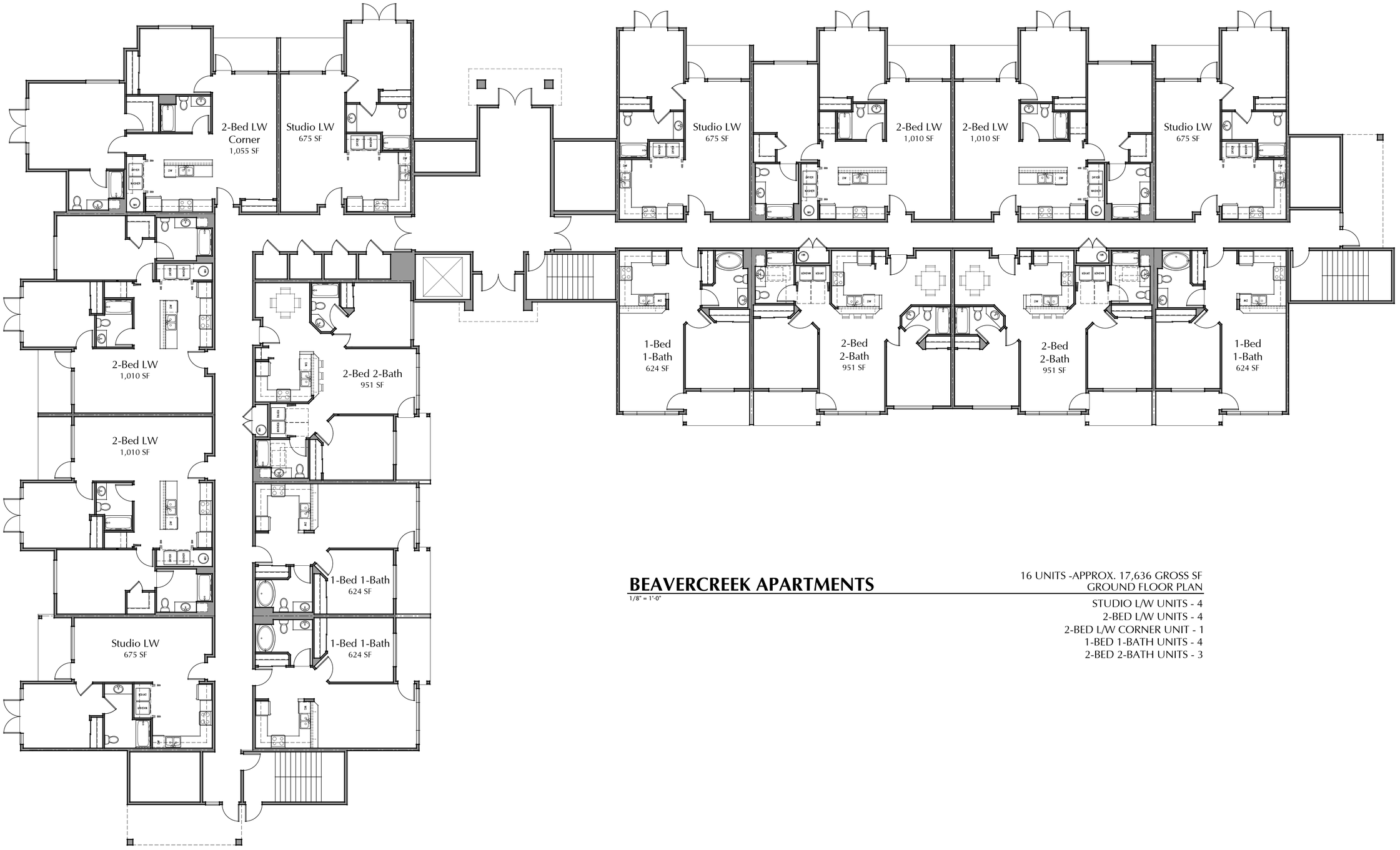
Scale: 1 : 40
Drawn By: APT
Date:
Date Plotted: 1-13-14

Oregon City Live/Work
A Live/Work Apartment and Townhome Development
Oregon City, Oregon
Evergreen Housing Development Group

Job No.: 12-39
Sheet No.: A1

Sheet Order: A B U F R E S D BE

LAYOUT1 - SITE PLAN.DWG



BEAVERCREEK APARTMENTS

1/8" = 1'-0"

16 UNITS -APPROX. 17,636 GROSS SF
GROUND FLOOR PLAN

STUDIO L/W UNITS - 4
2-BED L/W UNITS - 4
2-BED L/W CORNER UNIT - 1
1-BED 1-BATH UNITS - 4
2-BED 2-BATH UNITS - 3

H:\1239\APARTMETN_BUILDING.DWG

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community
Oregon City, Oregon

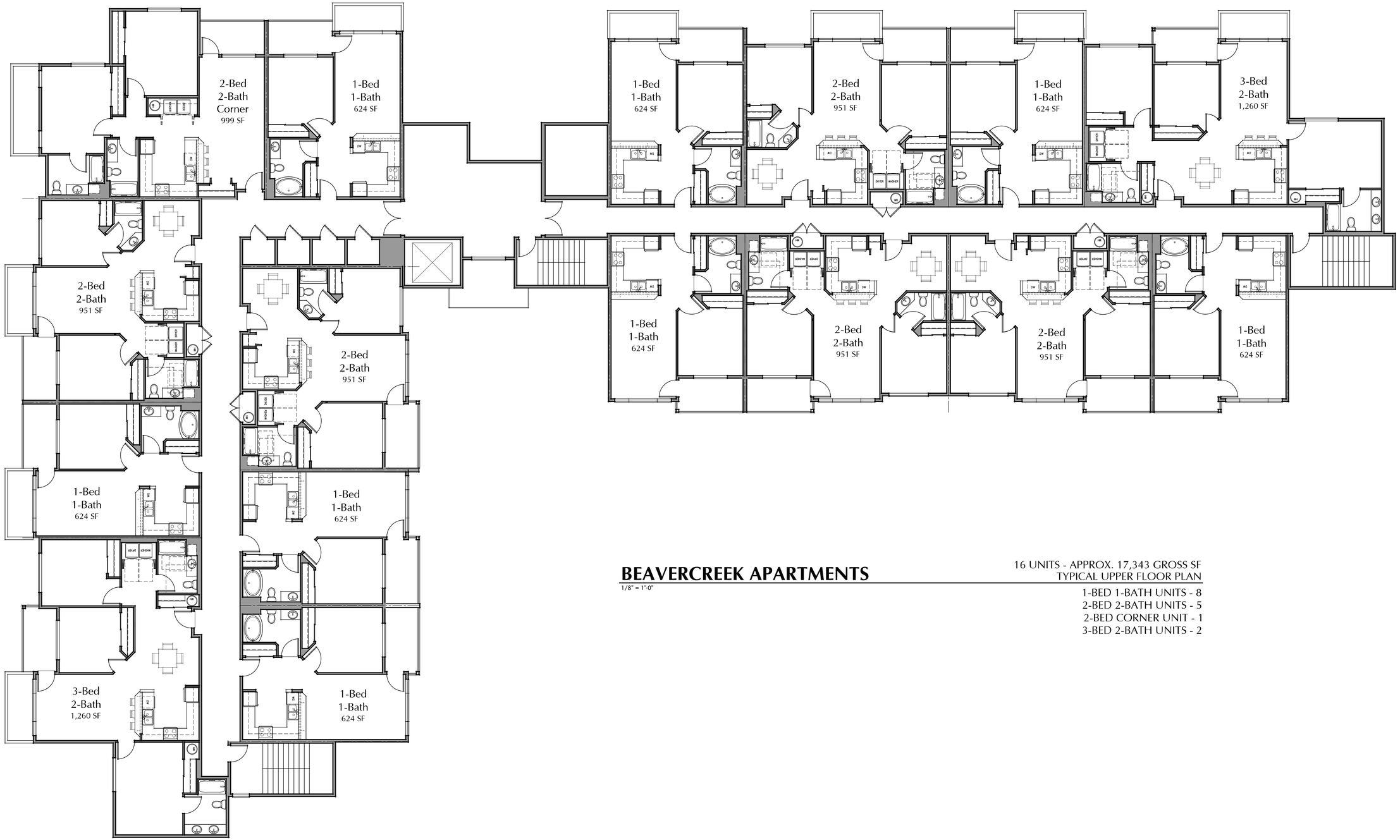
Evergreen Housing Development Group

Typical Apartment Building
First Floor Plan

Scale:	Drawn By:	Date:	Date Plotted:
1/8" = 1'-0"	APT	01-14-14	1-13-14

Sheet No.: **A2**

Job No.: **12-39**



BEAVERCREEK APARTMENTS

1/8" = 1'-0"

16 UNITS - APPROX. 17,343 GROSS SF
TYPICAL UPPER FLOOR PLAN

1-BED 1-BATH UNITS - 8
2-BED 2-BATH UNITS - 5
2-BED CORNER UNIT - 1
3-BED 2-BATH UNITS - 2

H:\12.39\APARTMETN_BUILDING.DWG

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community
Oregon City, Oregon

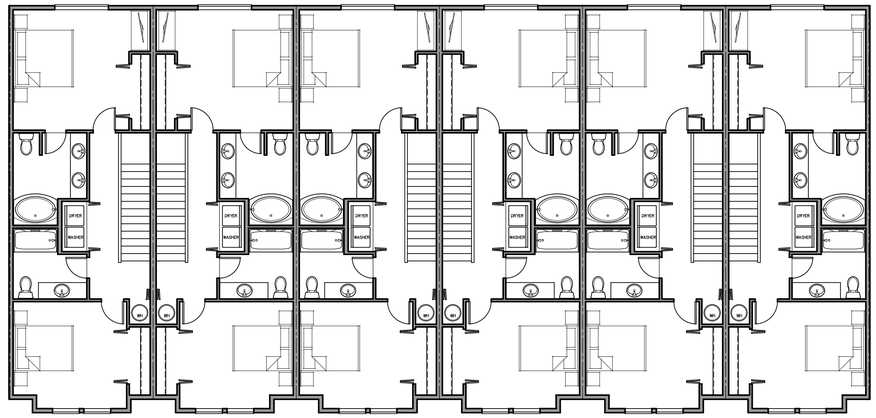
Evergreen Housing Development Group

Typical Apartment Building
Upper Floor Plans

Scale:	Drawn By:	Date:	Date Plotted:
1/8" = 1'-0"	APT	01-14-14	1-13-14

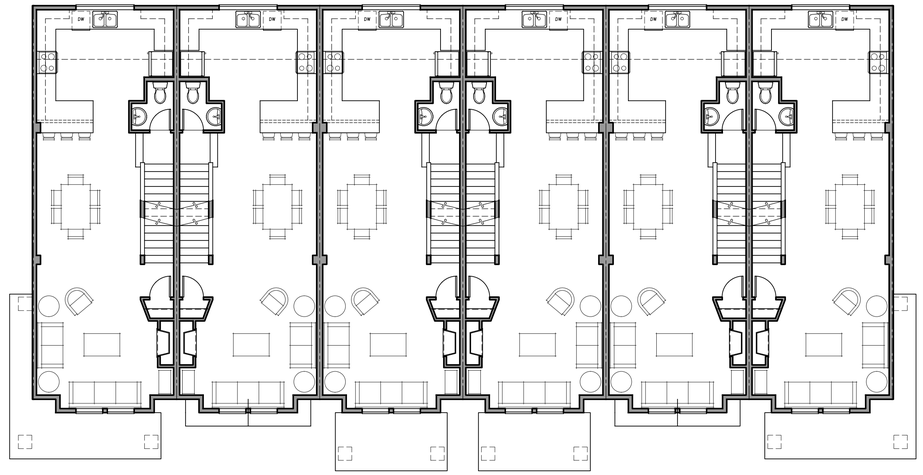
Sheet No.: **A3**

Job No.: **12-39**



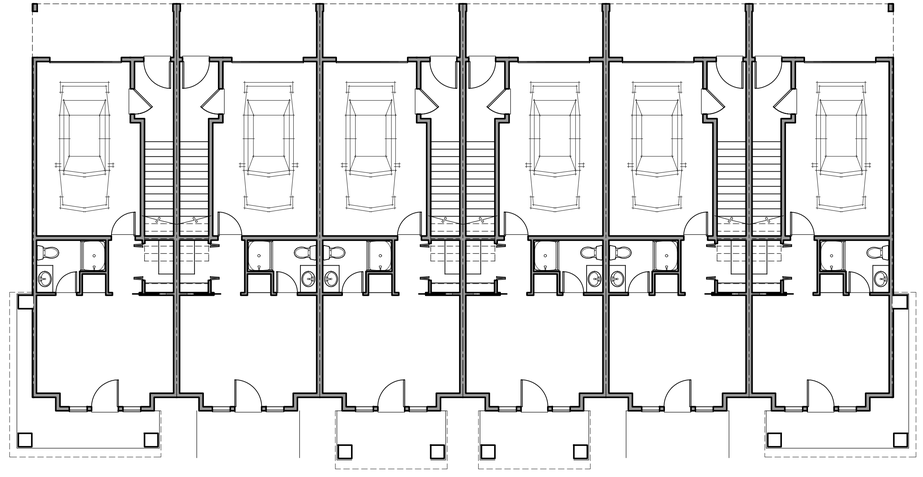
6-PLEX TOWNHOME — UPPER LEVEL PLAN

1/8" = 1'-0"



6-PLEX TOWNHOME — MIDDLE LEVEL PLAN

1/8" = 1'-0"



6-PLEX TOWNHOME — LOWER LEVEL PLAN

1/8" = 1'-0"

H:\1239\6-PLEX TOWNHOME.DWG

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community

Oregon City, Oregon

Evergreen Housing Development Group

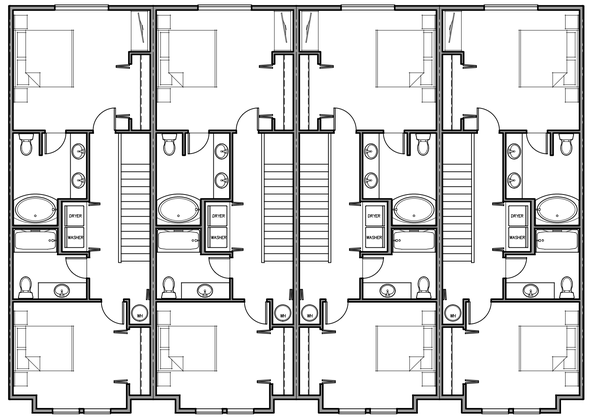
6-Plex Townhome Building

Floor Plans

Scale:	Drawn By:	Date:	Date Plotted:
1/8" = 1'-0"	APT	01-14-14	1-13-14

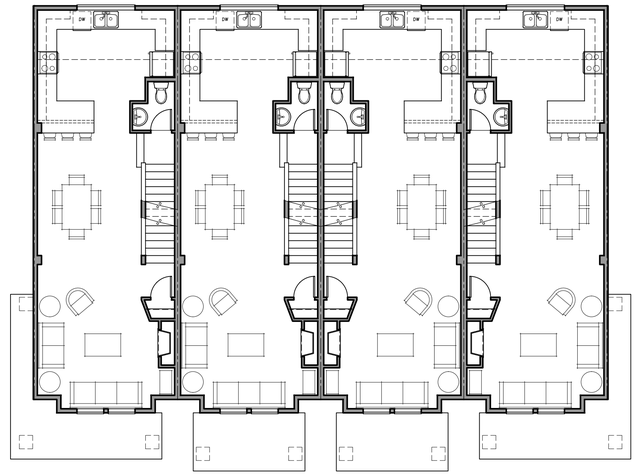
Sheet No.: **A4**

Job No.: **12-39**



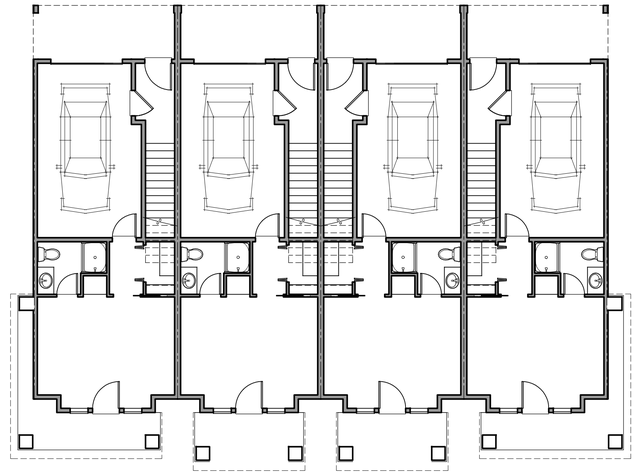
4-PLEX TOWNHOME — UPPER LEVEL PLAN

1/8" = 1'-0"



4-PLEX TOWNHOME — MIDDLE LEVEL PLAN

1/8" = 1'-0"



4-PLEX TOWNHOME — LOWER LEVEL PLAN

1/8" = 1'-0"

H:\1239\6-PLEX_TOWNHOME.DWG

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community

Oregon City, Oregon

Evergreen Housing Development Group

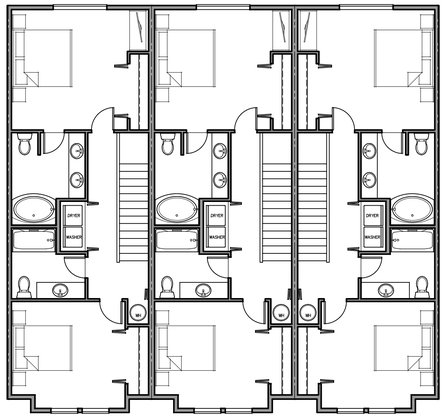
4-Plex Townhome Building

Floor Plans

Scale:	Drawn By:	Date:	Date Plotted:
1/8" = 1'-0"	APT	01-14-14	1-13-14

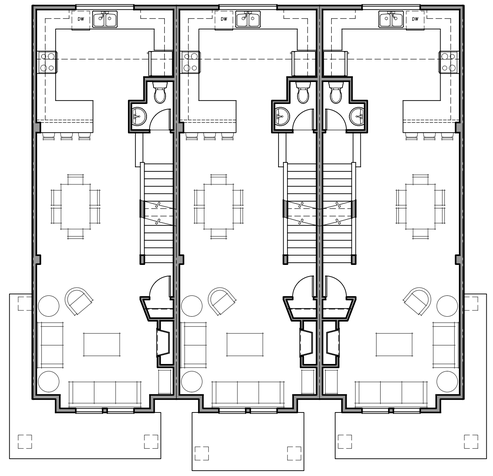
Sheet No.: A5

Job No.: 12-39



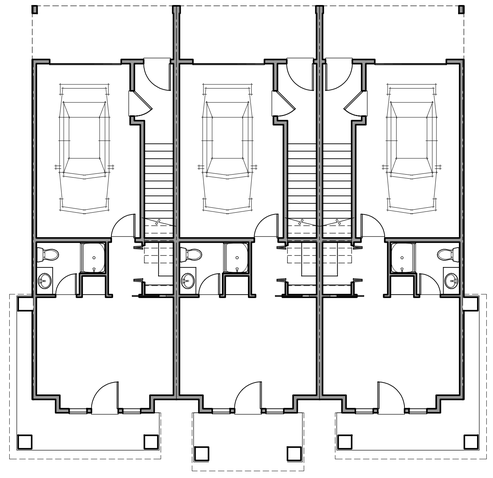
3-PLEX TOWNHOME UPPER LEVEL PLAN

1/8" = 1'-0"



3-PLEX TOWNHOME MIDDLE LEVEL PLAN

1/8" = 1'-0"



3-PLEX TOWNHOME LOWER LEVEL PLAN

1/8" = 1'-0"

H:\1239\6-PLEX TOWNHOME.DWG

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community

Oregon City, Oregon

Evergreen Housing Development Group

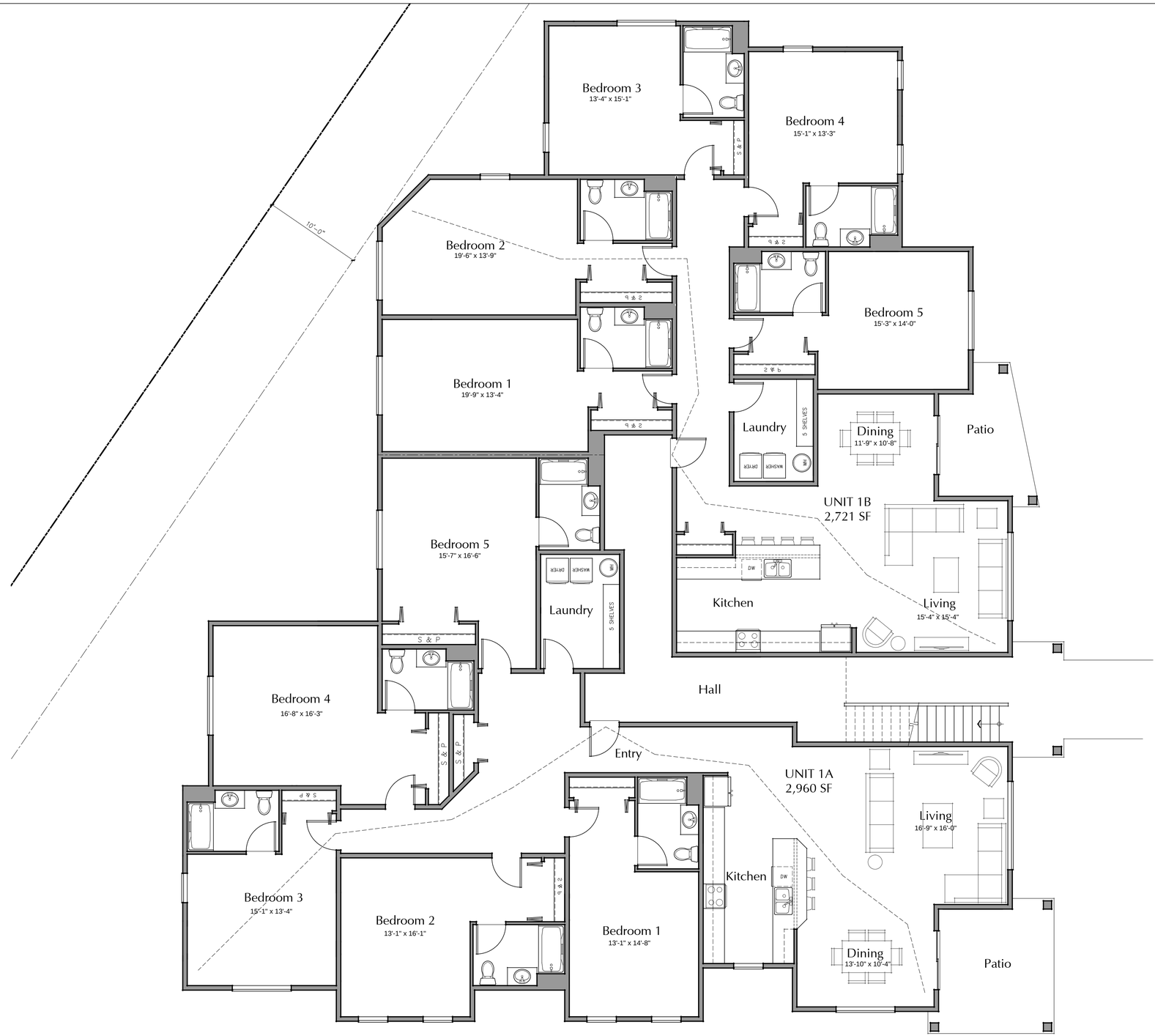
3-Plex Townhome Building

Floor Plans

Scale:	Drawn By:	Date:	Date Plotted:
1/8" = 1'-0"	APT	01-14-14	1-13-14

Sheet No.: **A6**

Job No.: 12-39



BUILDING C1

3/16" = 1'-0"

LOWER LEVEL PLAN

H: \12.39\GROUP UNIT.DWG

Milbrandt Architects, Inc., P.S.

25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community

Oregon City, Oregon

Evergreen Housing Development Group

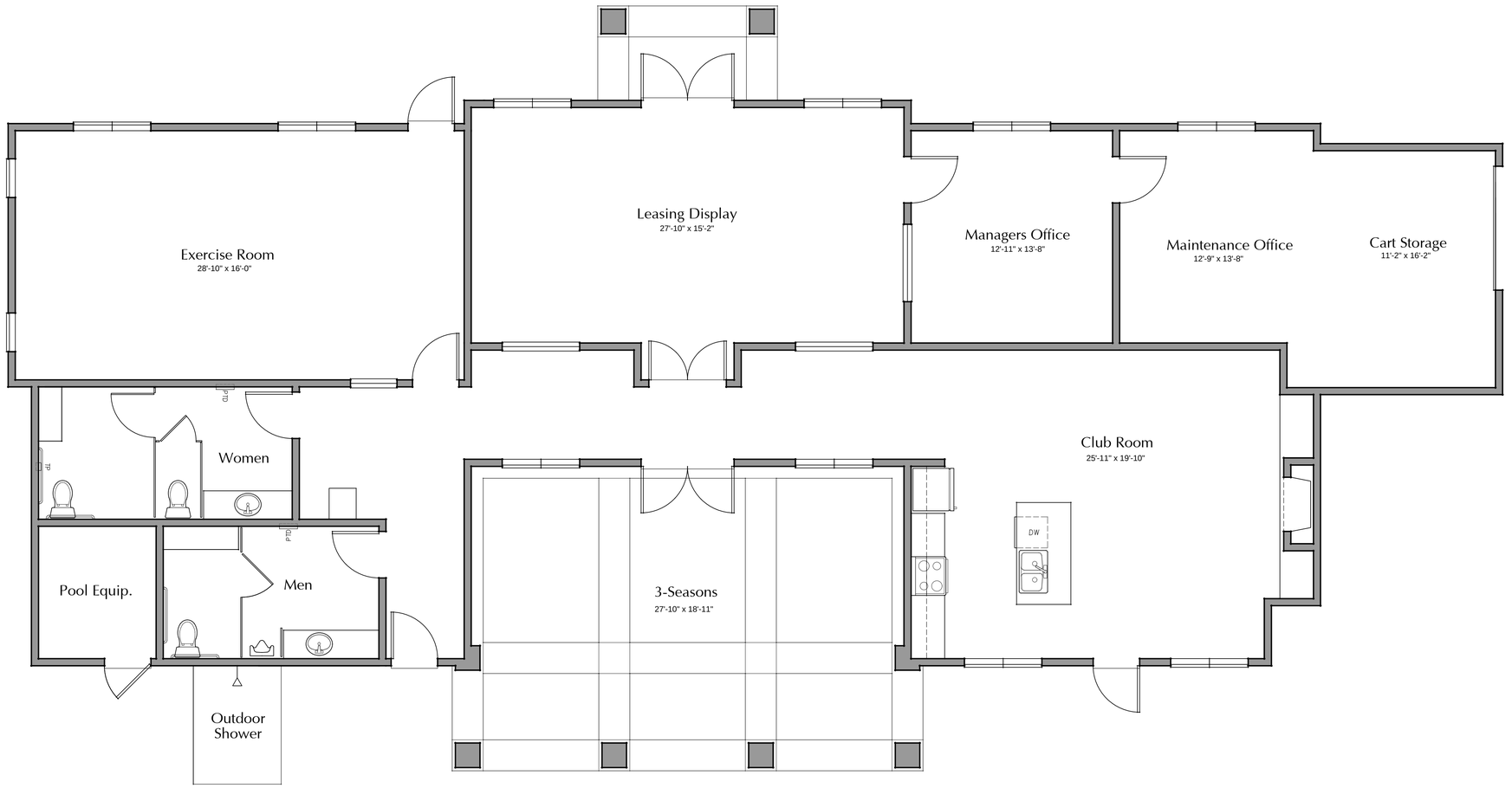
Building C1

Proposed Floor Plans

Scale:	Drawn By:	Date:	Date Plotted:
3/16" = 1'-0"	APT	01-14-14	1-13-14

Sheet No.: **A7**

Job No.: **12-39**



COMMUNITY CENTER

1/4" = 1'-0"

2,717 SF
FIRST FLOOR PLAN

H: \12.39\CLUBHOUSE.DWG

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community
Oregon City, Oregon

Evergreen Housing Development Group

Community Center
Proposed Floor Plan

Scale:	Drawn By:	Date:	Date Plotted:
1/4" = 1'-0"	APT	01-14-14	1-13-14

Sheet No.: **A8**

Job No.: **12-39**

TYPICAL APARTMENT BUILDING

1/8" = 1'-0"

FRONT/STREET-FACING ELEVATION

TYPICAL APARTMENT BUILDING

1/8" = 1'-0"

SIDE/STREET-FACING ELEVATION

TYPICAL APARTMENT BUILDING

1/8" = 1'-0"

SIDE/END ELEVATION

H:\1239\APARTMETN_BUILDING.DWG

Milbrandt Architects, Inc., P.S.

25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community

Oregon City, Oregon

Evergreen Housing Development Group

Typical Apartment Building

Exterior Elevations

Scale:	Drawn By:	Date:	Date Plotted:
1/8" = 1'-0"	APT	01-14-14	1-13-14

Sheet No.: **E1**

Job No.: 12-39

TYPICAL APARTMENT BUILDING

1/8" = 1'-0"

FRONT/ALLEY-FACING ELEVATION

TYPICAL APARTMENT BUILDING

1/8" = 1'-0"

SIDE/ALLEY-FACING ELEVATION

TYPICAL APARTMENT BUILDING

1/8" = 1'-0"

FRONT/END ELEVATION

H:\1239\APARTMETN_BUILDING.DWG

Milbrandt Architects, Inc., P.S.

25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community

Oregon City, Oregon

Evergreen Housing Development Group

Typical Apartment Building

Exterior Elevations

Scale:	Drawn By:	Date:	Date Plotted:
1/8" = 1'-0"	APT	01-14-14	1-13-14

Sheet No.: **E2**

Job No.: 12-39

6-PLEX TOWNHOME BUILDING
FRONT ELEVATION

3/16" = 1'-0"

TYPICAL TOWNHOME BUILDING
SIDE ELEVATION

3/16" = 1'-0"

6-PLEX TOWNHOME BUILDING
REAR ELEVATION

3/16" = 1'-0"

H:\12.39\6-PLEX_TOWNHOME.DWG

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community

Oregon City, Oregon

Evergreen Housing Development Group

6-Plex Townhome Building
Exterior Elevations

Scale:	Drawn By:	Date:	Date Plotted:
3/16" = 1'-0"	APT	01-14-14	1-13-14

Sheet No.: **E3**

Job No.: 12-39

4-PLEX TOWNHOME BUILDING
FRONT ELEVATION

3/16" = 1'-0"

TYPICAL TOWNHOME BUILDING
SIDE ELEVATION

3/16" = 1'-0"

4-PLEX TOWNHOME BUILDING
REAR ELEVATION

3/16" = 1'-0"

H:\12.39\6-PLEX_TOWNHOME.DWG

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community

Oregon City, Oregon

Evergreen Housing Development Group

4-Plex Townhome Building
Exterior Elevations

Scale:	Drawn By:	Date:	Date Plotted:
3/16" = 1'-0"	APT	01-14-14	1-13-14

Sheet No.: **E4**

Job No.: **12-39**

3-PLEX TOWNHOME BUILDING — FRONT ELEVATION

3/16" = 1'-0"

TYPICAL TOWNHOME BUILDING — SIDE ELEVATION

3/16" = 1'-0"

3-PLEX TOWNHOME BUILDING — REAR ELEVATION

3/16" = 1'-0"

H: \1239\6--PLEX TOWNHOME.DWG

Milbrandt Architects, Inc., P.S.

25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community

Oregon City, Oregon

Evergreen Housing Development Group

3-Plex Townhome Building

Exterior Elevations

Scale:	Drawn By:	Date:	Date Plotted:
3/16" = 1'-0"	APT	01-14-14	1-13-14

Sheet No.: **E5**

Job No.: **12-39**

BUILDING C1
3/16" = 1'-0"

SOUTH/MEYERS ROAD - ENTRY ELEVATION

BUILDING C1
3/16" = 1'-0"

WEST/BEAVERCREEK ROAD ELEVATION

H:\1239\GROUP_UNIT.DWG

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community
Oregon City, Oregon

Evergreen Housing Development Group

Building C1

Proposed South and West Exterior Elevations

Scale:	Drawn By:	Date:	Date Plotted:
3/16" = 1'-0"	APT	01-14-14	1-13-14

Sheet No.: **E6**

Job No.: 12-39

BUILDING C1

3/16" = 1'-0"

EAST/PARKING LOT ELEVATION

BUILDING C1

3/16" = 1'-0"

NORTH ELEVATION

H: \1239\GROUP_UNIT.DWG

Milbrandt Architects, Inc., P.S.

25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community

Oregon City, Oregon

Evergreen Housing Development Group

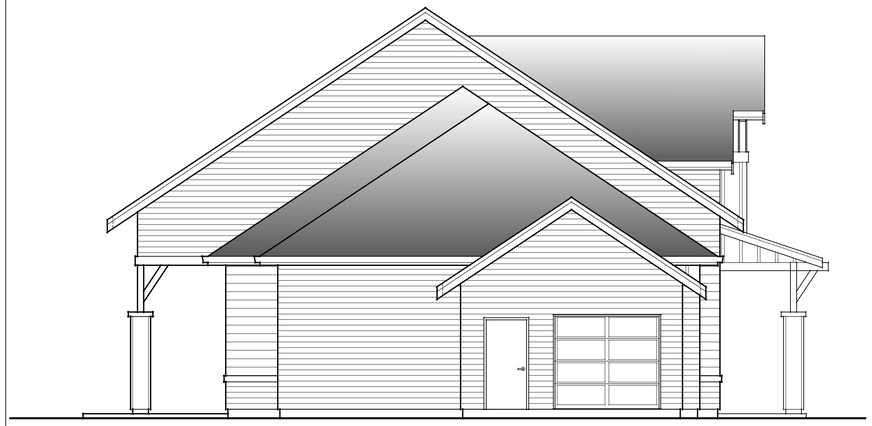
Building C1

Proposed East and North Exterior Elevations

Scale:	Drawn By:	Date:	Date Plotted:
3/16" = 1'-0"	APT	01-14-14	1-13-14

Sheet No.: **E7**

Job No.: **12-39**

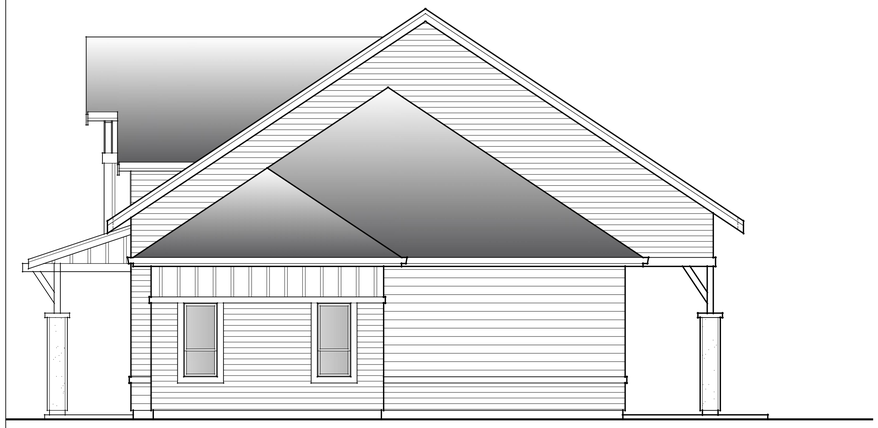


COMMUNITY CENTER
3/16" = 1'-0"

SIDE/NORTH-FACING ELEVATION

COMMUNITY CENTER
3/16" = 1'-0"

FRONT/STREET B FACING ELEVATION



COMMUNITY CENTER
3/16" = 1'-0"

SIDE/STREET A FACING ELEVATION

COMMUNITY CENTER
3/16" = 1'-0"

REAR/POOL ELEVATION

H:\1239\CLUBHOUSE.DWG

Milbrandt Architects, Inc., P.S.
25 Central Way, Suite 210, Kirkland, Washington 98033 Phone: 425-454-7130 Fax: 425-658-1208 Website: http://www.milbrandtarch.com

Oregon City Live/Work

A Live/Work Apartment and Townhome Community

Oregon City, Oregon

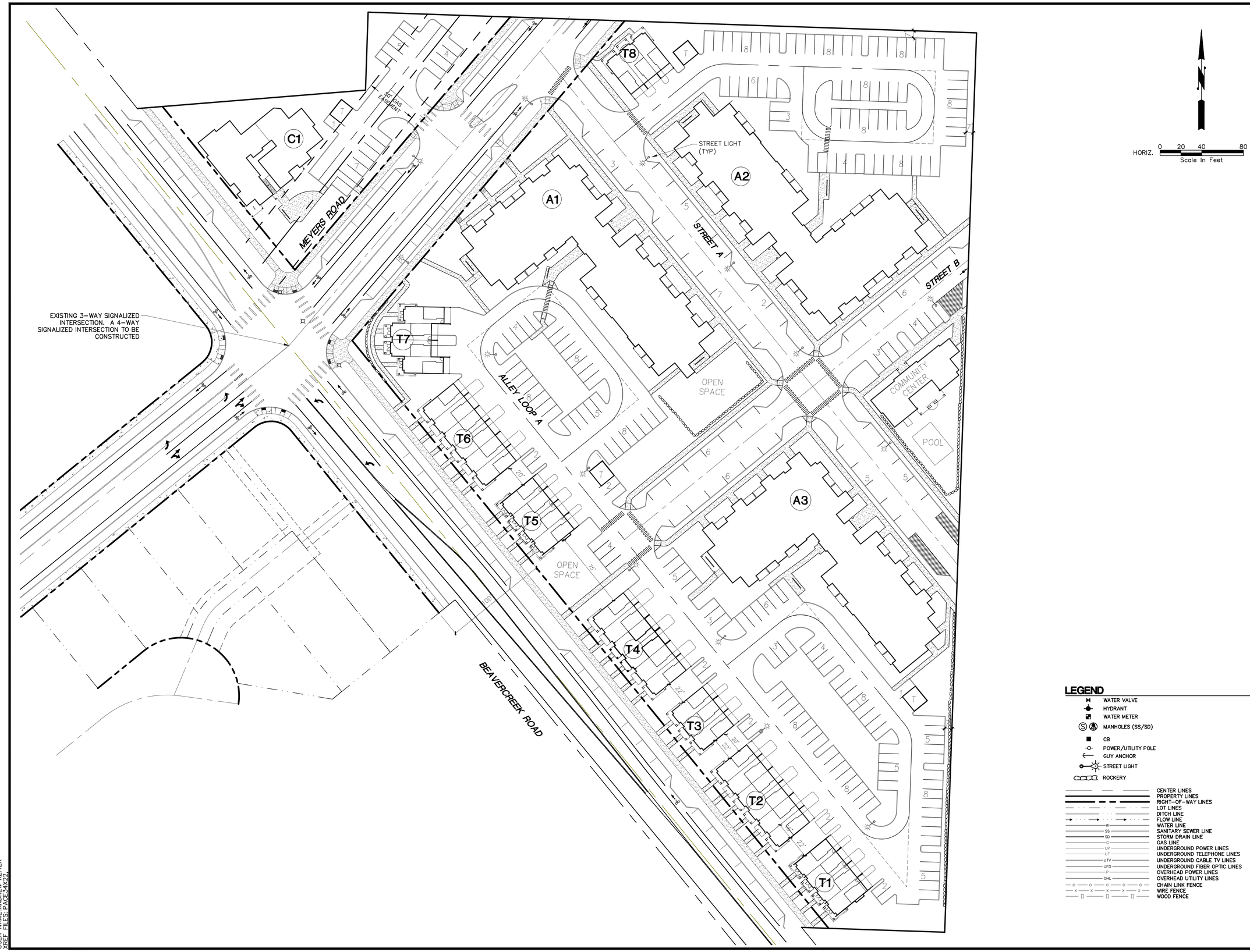
Evergreen Housing Development Group

Community Center
Proposed Exterior Elevations

Scale:	Drawn By:	Date:	Date Plotted:
3/16" = 1'-0"	APT	01-14-14	1-13-14

Sheet No.: **E8**

Job No.: 12-39



LEGEND

- WATER VALVE
- HYDRANT
- WATER METER
- MANHOLES (SS/SD)
- CB
- POWER/UTILITY POLE
- GUY ANCHOR
- STREET LIGHT
- ROCKERY
- CENTER LINES
- PROPERTY LINES
- RIGHT-OF-WAY LINES
- LOT LINES
- DITCH LINE
- FLOW LINE
- W — WATER LINE
- SS — SANITARY SEWER LINE
- SD — STORM DRAIN LINE
- G — GAS LINE
- UP — UNDERGROUND POWER LINES
- UT — UNDERGROUND TELEPHONE LINES
- UTV — UNDERGROUND CABLE TV LINES
- UFO — UNDERGROUND FIBER OPTIC LINES
- P — OVERHEAD POWER LINES
- OHL — OVERHEAD UTILITY LINES
- CHAIN LINK FENCE
- WIRE FENCE
- WOOD FENCE

SYM	REVISION	DATE

PACE
An Engineering Services Company
5000 Meadows Road
Lake Oswego, Oregon 97035
p. 503.597.3222 | f. 503.597.7655
Civil | Structural | Planning | Survey
paceengrs.com

REGISTERED PROFESSIONAL ENGINEER
14,788
OREGON
JANUARY 23, 1990
ANDREW A. REITER
EXPIRES: 12/31/2014

SITE PLAN

A LIVE/WORK APARTMENT AND TOWNHOME DEVELOPMENT

19896 BEAVERCREEK RD.
OREGON CITY, OR

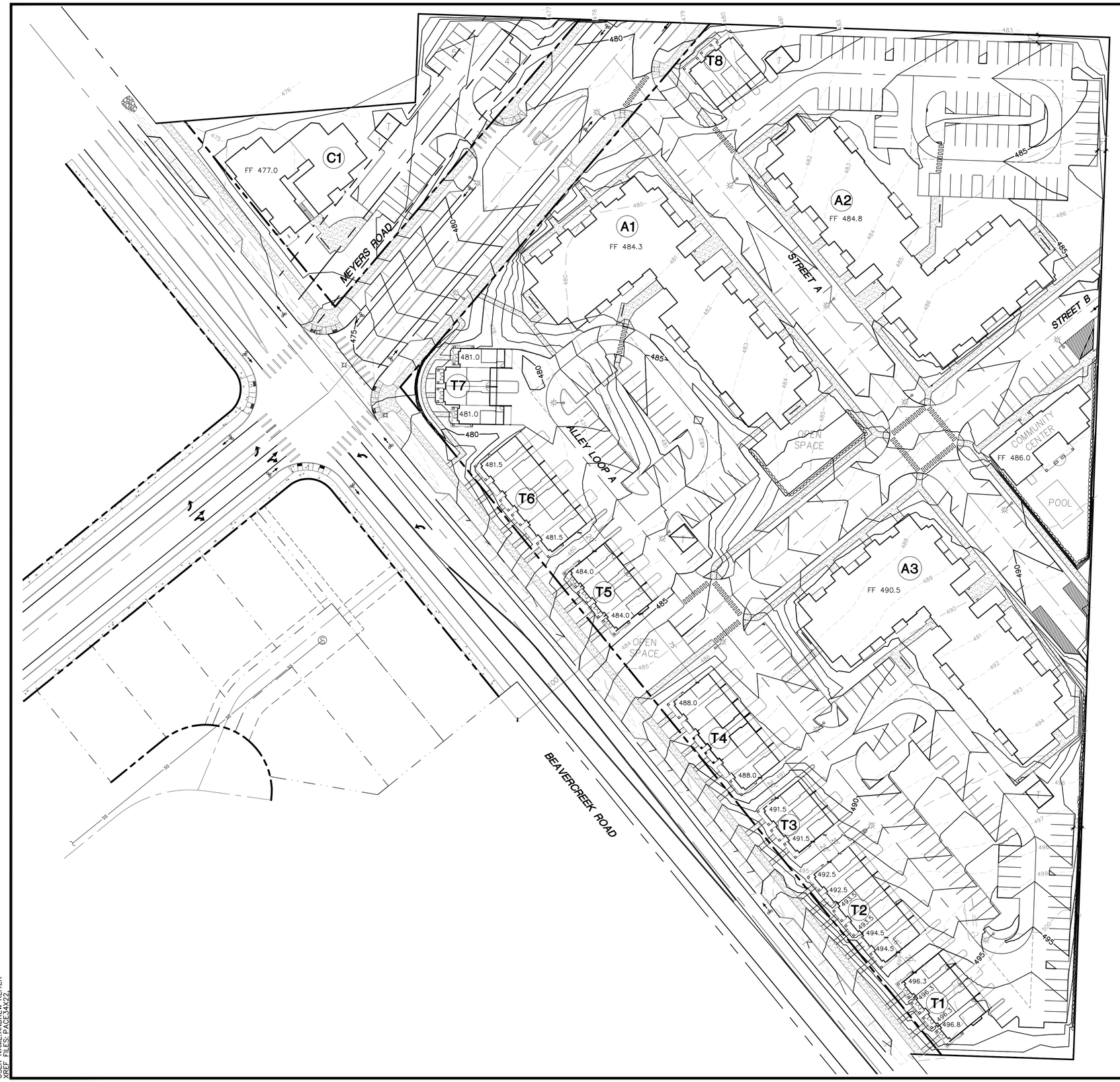
SCALE:	DATE:
1"=40'	1/08/14
DESIGNED BY:	CHECKED BY:
AAR	DP

JOB NUMBER
13869

DWG NAME:
C1 SITE PLAN

SHEET C1 OF 4

FILE NAME: P:\P13\13869 - EVERGREEN HOUSING - BEAVERCREEK ROAD\CAD\SHEETS\C1 SITE PLAN.DWG
SAVE TIME: 1/9/2014 3:43:38 PM
PLOT TIME: 1/9/2014 11:54 AM
USER NAME: ANDREW REITER
XREF FILES: PACE34x22



LEGEND

- WATER VALVE
- HYDRANT
- WATER METER
- MANHOLES (SS/SD)
- CB
- POWER/UTILITY POLE
- GUY ANCHOR
- STREET LIGHT
- ROCKERY

- CENTER LINES
- PROPERTY LINES
- RIGHT-OF-WAY LINES
- LOT LINES
- DITCH LINE
- FLOW LINE
- W — WATER LINE
- SS — SANITARY SEWER LINE
- SD — STORM DRAIN LINE
- G — GAS LINE
- UP — UNDERGROUND POWER LINES
- UT — UNDERGROUND TELEPHONE LINES
- UTV — UNDERGROUND CABLE TV LINES
- UFO — UNDERGROUND FIBER OPTIC LINES
- OHP — OVERHEAD POWER LINES
- OHL — OVERHEAD UTILITY LINES
- CHAIN LINK FENCE
- WIRE FENCE
- WOOD FENCE

DATE | REVISION | SYM

PACE
An Engineering Services Company
5000 Meadows Road
Lake Oswego, Oregon 97035
p. 503.597.3222 | f. 503.597.7655
Civil | Structural | Planning | Survey
paceengrs.com

REGISTERED PROFESSIONAL ENGINEER
14,788
OREGON
JANUARY 23, 1980
ANDREW A. REITER
EXPIRES: 12/31/2014

GRADING PLAN

A LIVE/WORK APARTMENT AND TOWNHOME DEVELOPMENT

19896 BEAVERCREEK RD.
OREGON CITY, OR

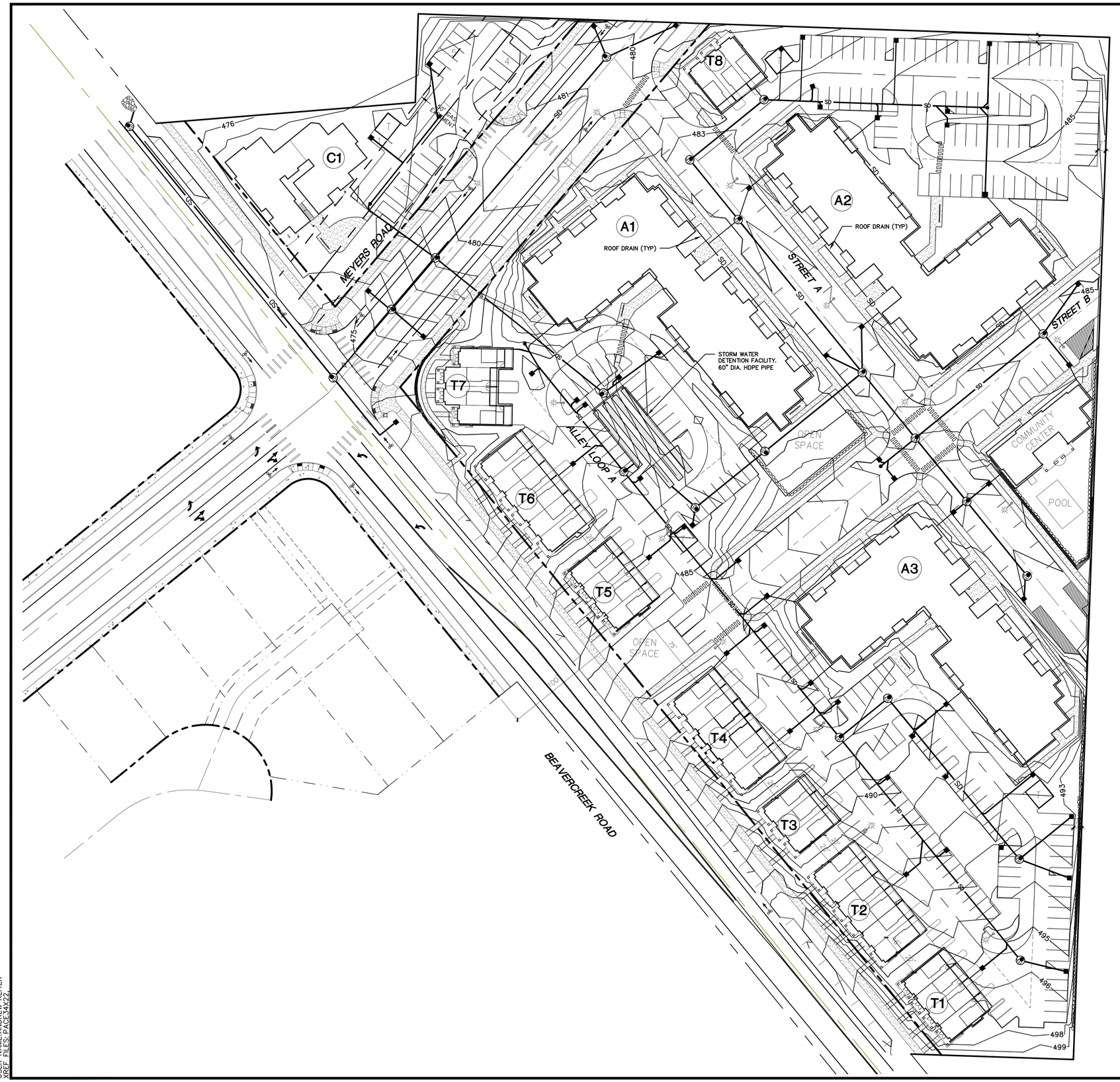
SCALE:	DATE:
1"=40'	1/08/14
DESIGNED BY:	CHECKED BY:
AAR	DP

JOB NUMBER
13869

DWG NAME:
C2 GRADING PLAN

SHEET C2 OF 4

FILE NAME: P:\P13\13869 - EVERGREEN HOUSING - BEAVERCREEK ROAD\CAD\SHEETS\C2 GRADING PLAN.DWG
SAVE TIME: 1/9/2014 3:37:42 PM
PLOT TIME: 1/14/2014 11:54 AM
USER NAME: ANDREW REITER
XREF FILES: PACE34x22



LEGEND

- WATER VALVE
- HYDRANT
- WATER METER
- MANHOLES (SS/SD)
- CB
- POWER/UTILITY POLE
- GUY ANCHOR
- STREET LIGHT
- ROCKERY

- CENTER LINES
- PROPERTY LINES
- RIGHT-OF-WAY LINES
- LOT LINES
- DITCH LINE
- FLOW LINE
- W — WATER LINE
- SS — SANITARY SEWER LINE
- SD — STORM DRAIN LINE
- G — GAS LINE
- UP — UNDERGROUND POWER LINES
- UT — UNDERGROUND TELEPHONE LINES
- UTV — UNDERGROUND CABLE TV LINES
- UFO — UNDERGROUND FIBER OPTIC LINES
- P — OVERHEAD POWER LINES
- OHL — OVERHEAD UTILITY LINES
- CHAIN LINK FENCE
- WIRE FENCE
- WOOD FENCE

DD SET

DATE | REVISION | SYM

PACE
An Engineering Services Company
5000 Meadows Road
Lake Oswego, Oregon 97035
p. 503.597.3222 | f. 503.597.7655
Civil | Structural | Planning | Survey
paceengrs.com

REGISTERED PROFESSIONAL ENGINEER
14,788
OREGON
JANUARY 23, 1990
ANDREW A. REITER
EXPIRES: 12/31/2014

STORM DRAINAGE PLAN

A LIVE/WORK APARTMENT AND TOWNHOME DEVELOPMENT

19896 BEAVERCREEK RD.
OREGON CITY, OR

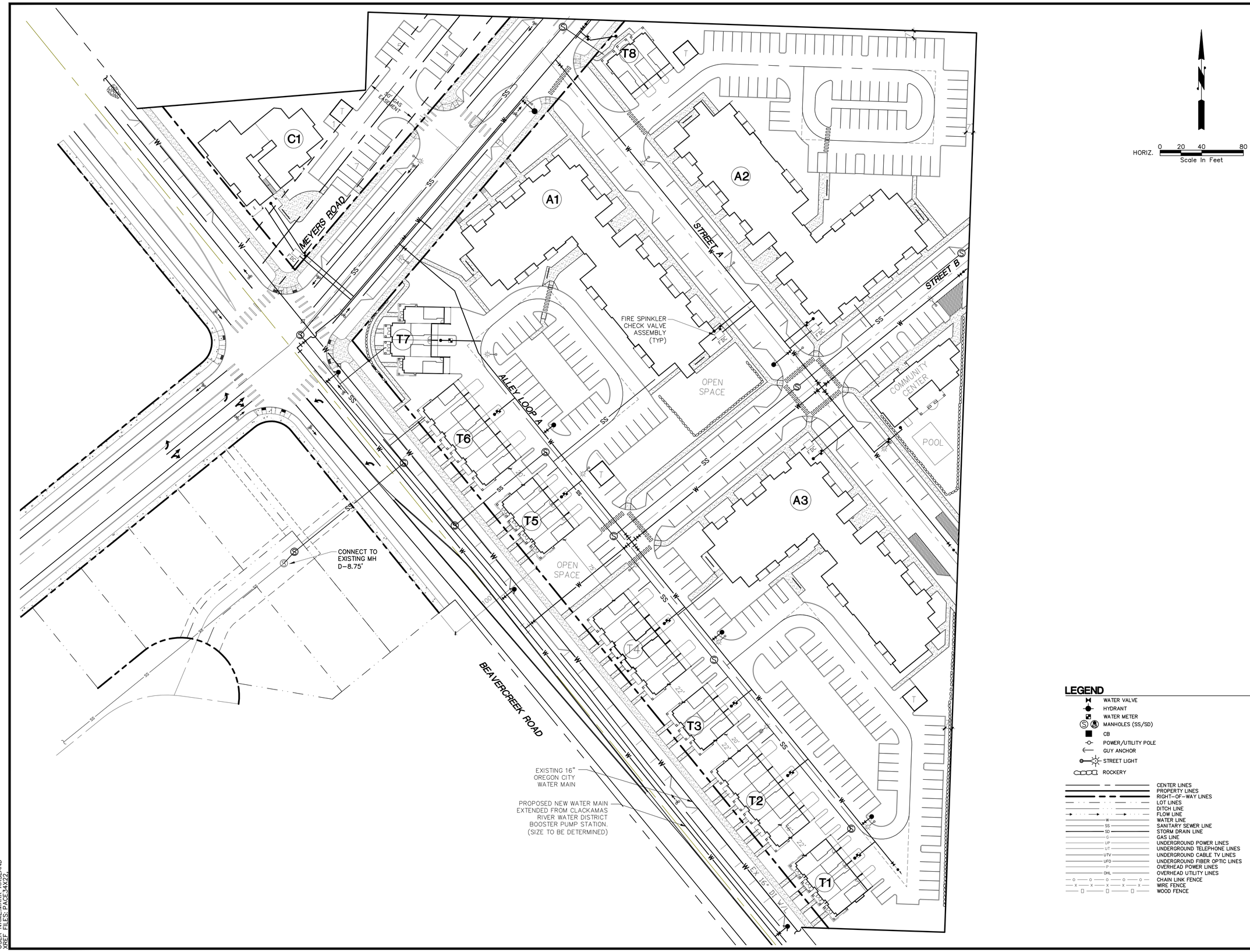
SCALE:	DATE:
1"=40'	1/08/14
DESIGNED BY: AAR	CHECKED BY: DP

JOB NUMBER **13869**

DWG NAME: C3 STORM DRAINAGE

SHEET C3 OF 4

FILE NAME: P:\P13\13869 - EVERGREEN HOUSING - BEAVERCREEK ROAD\CAD\SHEETS\C3 STORM DRAINAGE.DWG
SAVE TIME: 1/9/2014 3:58:58 PM
PLOT TIME: 1/14/2014 11:54 AM
USER NAME: ANDREW REITER
XREF FILES: PACE34x22



LEGEND

- WATER VALVE
- HYDRANT
- WATER METER
- MANHOLES (SS/SD)
- CB
- POWER/UTILITY POLE
- GUY ANCHOR
- STREET LIGHT
- ROCKERY

- CENTER LINES
- PROPERTY LINES
- RIGHT-OF-WAY LINES
- LOT LINES
- DITCH LINE
- FLOW LINE
- W — WATER LINE
- SS — SANITARY SEWER LINE
- SD — STORM DRAIN LINE
- G — GAS LINE
- UP — UNDERGROUND POWER LINES
- UT — UNDERGROUND TELEPHONE LINES
- UTV — UNDERGROUND CABLE TV LINES
- UFO — UNDERGROUND FIBER OPTIC LINES
- P — OVERHEAD POWER LINES
- OHL — OVERHEAD UTILITY LINES
- CHAIN LINK FENCE
- WIRE FENCE
- WOOD FENCE

DATE	REVISION	SYM

PACE
An Engineering Services Company
5000 Meadows Road
Lake Oswego, Oregon 97035
p. 503.597.3222 | f. 503.597.7655
Civil | Structural | Planning | Survey
paceengrs.com

REGISTERED PROFESSIONAL ENGINEER
14,758
OREGON
JANUARY 23, 2009
ANDREW A. REITER
EXPIRES: 12/31/2014

WATER AND SEWER PLAN

A LIVE/WORK APARTMENT AND TOWNHOME DEVELOPMENT

19896 BEAVERCREEK RD.
OREGON CITY, OR

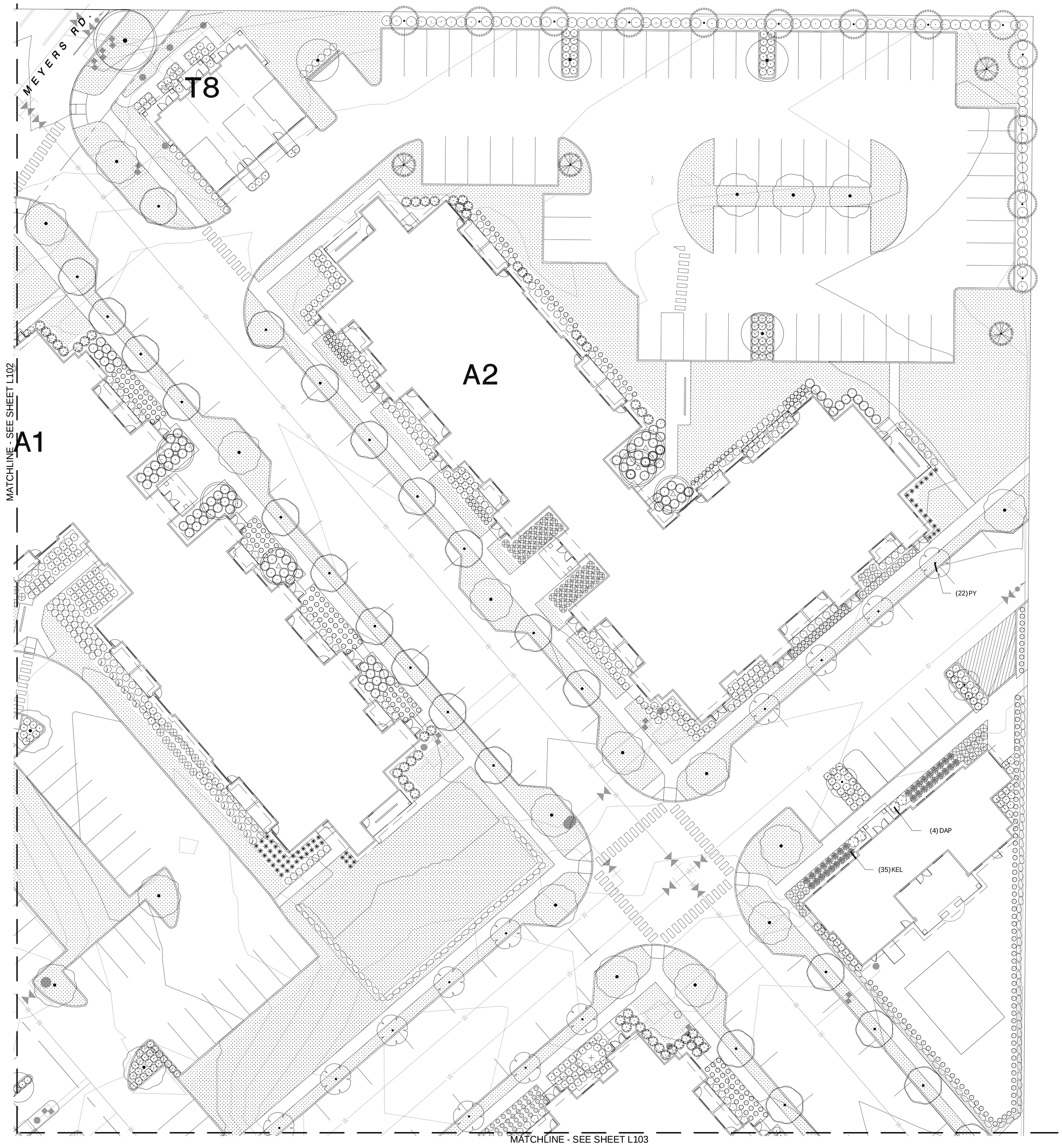
SCALE:	DATE:
1"=40'	1/08/14
DESIGNED BY: AAR	CHECKED BY: DP

JOB NUMBER
13869

DWG NAME:
C4 WATER & SEWER PLAN

SHEET C4 OF 4

FILE NAME: \\O-DATASVR2\PROJECT_DOCS\P13\13869 - EVERGREEN HOUSING - BEAVERCREEK ROAD\CAD\SHEETS\C4 WATER & SEWER PLAN.DWG
SAVE TIME: 1/9/2014 3:59:23 PM
PLOT TIME: MAR/2014 11:04 AM
USER NAME: AAR, AND
XREF FILES: PACE34x22



PLANT SCHEDULE

TREES	BOTANICAL NAME	CONT	CAL	SIZE	QTY
△	ACER CIRCINATUM `PACIFIC FIRE`	-		6` HGT.	6
•	ACER GRISEUM	B & B	2"CAL		4
•	CALOCEDRUS DECURRENS	B & B		6` HGT.	3
•	CARPINUS BETULUS `FASTIGIATA`	B & B	2"CAL		43
•	CRATAEGUS LAEVIGATA `CRIMSON CLOUD`	B & B	3.5"CAL		17
•	FRAXINUS ORNUS	B & B	2"CAL		12
•	FRAXINUS OXYCARPA	B & B	2"CAL		31
•	PRUNUS SARGENTII `COLUMNARIS`	B & B	2"CAL		13
•	PYRUS CALLERYANA `GLEN`S FORM` TM	B & B	2"CAL		22
+	QUERCUS ROBUR `FASTIGIATA`	B & B	2"CAL		15
•	SEQUOIA SEMPERVIRENS	B & B		6` HGT.	8
•	ZELKOVA SERRATA `HALKA`	B & B	2"CAL		23

SHRUBS	BOTANICAL NAME	CONT	QTY
✳	CALAMAGROSTIS X ACUTIFLORA `KARL FOERSTER`	1 GAL	199
○	CAREX MORROWII `AUREA-VARIEGATA`	1 GAL	227
⊙	CHOISYA DUMOSA	1 GAL	28
✺	CORNUS SERICEA `KELSEYI`	1 GAL	35
◦	COTONEASTER DAMMERI `LOWFAST`	1 GAL	438
⊙	DAPHNE TRANSATLANTICA SUMMER ICE	1 GAL	4
⬡	EUONYMUS JAPONICUS `MICROPHYLLA`	1 GAL	374
⊙	HELICTOTRICHON SEMPERVIRENS	1 GAL	68
⊙	HYDRANGEA QUERCIFOLIA	1 GAL	76
⬡	MAHONIA AQUIFOLIUM `COMPACTA`	1 GAL	208
⊙	NANDINA DOMESTICA `GULF STREAM` TM	1 GAL	349
⬠	PENNISETUM ALOPECUROIDES `HAMELN`	1 GAL	510
◑	POTENTILLA FRUTICOSA `ABBOTSWOOD`	1 GAL	71
⊕	PRUNUS LAUROCERASUS `OTTO LUYKEN`	1 GAL	123
⊙	SARCOCOCCA HOOKERANA HUMILIS	1 GAL	79
⊙	SARCOCOCCA RUSCIFOLIA	1 GAL	135
⊙	THUJA OCCIDENTALIS `EMERALD`	4 FT.	192
⊕	VIBURNUM DAVIDII	1 GAL	87
⊙	VIBURNUM TINUS `SPRING BOUQUET` COMPACTUM	1 GAL	84

SYMBOL	DESCRIPTION
1	0-1/4" COMPACTED GRAVEL
2	BENCH

Note: An automatic irrigation syste will be provided

0 20 40 60 feet

SCALE: 1" = 20'

NORTH

PREPARED BY

SDLA
SHAPIRO DIDWAY
LANDSCAPE ARCHITECTS
1204 SE WATER AVE. • PORTLAND, OR 97214 • 503.232.0520

PROFESSIONAL LICENSE

REGISTERED 382 Stephen L Shapiro STEVEN L. SHAPIRO OREGON LANDSCAPE ARCHITECT

PROJECT

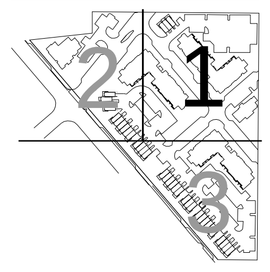
OREGON CITY LIVE/WORK

A LIVE/WORK APARTMENT AND TOWNHOME DEVELOPMENT

19896 BEAVERCREEK RD. OREGON CITY, OR

DRAWING LOG

KEY MAP



DRAWING PHASE

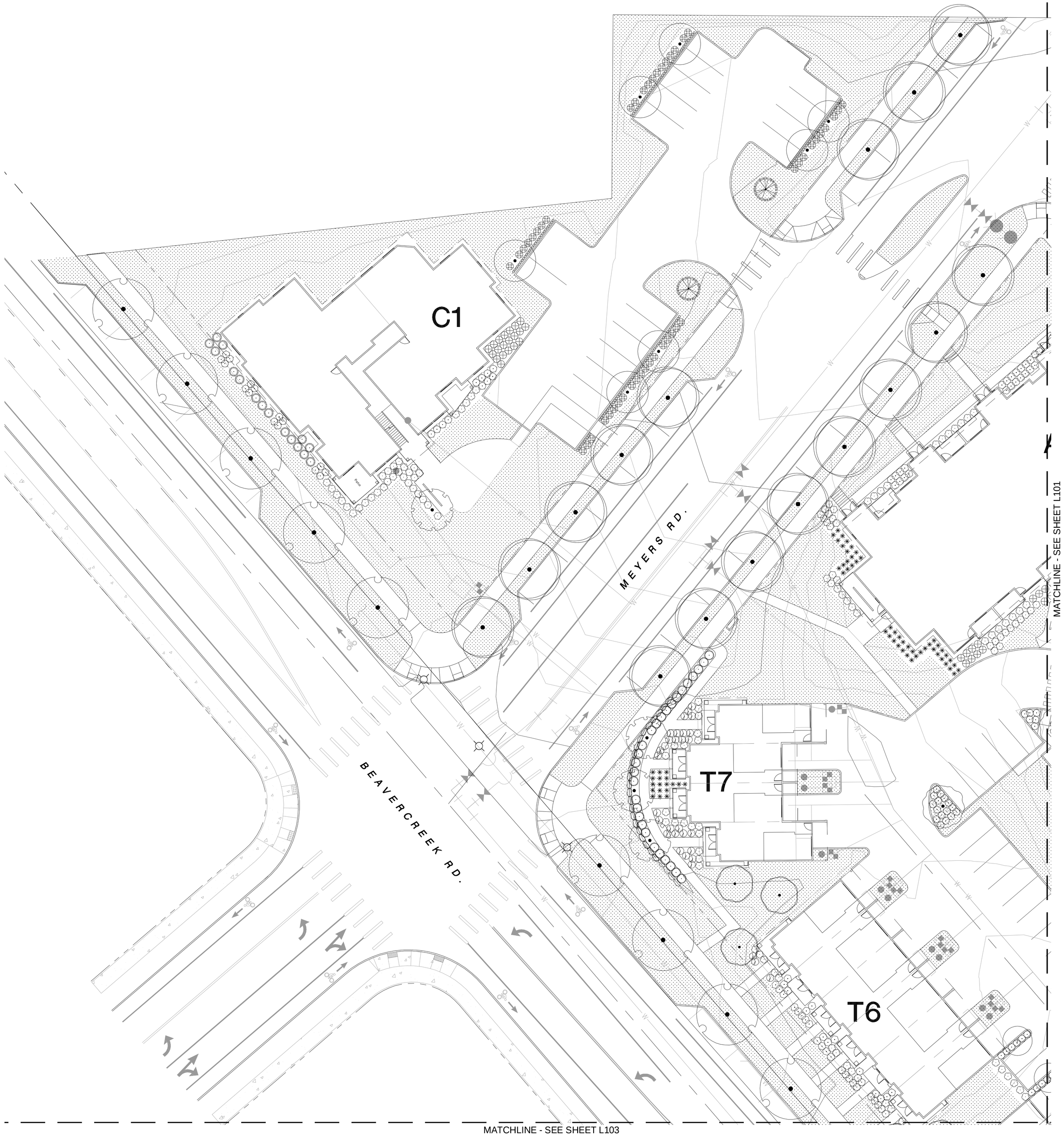
sheet title

LANDCAPE PLAN

sheet number

L101

1.14.2014



PLANT SCHEDULE

TREES	BOTANICAL NAME	CONT	CAL	SIZE
△	ACER CIRCINATUM `PACIFIC FIRE`	-		6` HGT.
•	ACER GRISEUM	B & B	2"CAL	
•	CALOCEDRUS DECURRENS	B & B		6` HGT.
•	CARPINUS BETULUS `FASTIGIATA`	B & B	2"CAL	
•	CRATAEGUS LAEVIGATA `CRIMSON CLOUD`	B & B	3.5"CAL	
•	FRAXINUS ORNUS	B & B	2"CAL	
•	FRAXINUS OXYCARPA	B & B	2"CAL	
•	PRUNUS SARGENTII `COLUMNARIS`	B & B	2"CAL	
•	PYRUS CALLERYANA `GLEN`S FORM` TM	B & B	2"CAL	
+	QUERCUS ROBUR `FASTIGIATA`	B & B	2"CAL	
•	SEQUOIA SEMPERVIRENS	B & B		6` HGT.
•	ZELKOVA SERRATA `HALKA`	B & B	2"CAL	

SHRUBS	BOTANICAL NAME	CONT
✳	CALAMAGROSTIS X ACUTIFLORA `KARL FOERSTER`	1 GAL
○	CAREX MORROWII `AUREA-VARIEGATA`	1 GAL
○	CHOISYA DUMOSA	1 GAL
✺	CORNUS SERICEA `KELSEYI`	1 GAL
◦	COTONEASTER DAMMERI `LOWFAST`	1 GAL
○	DAPHNE TRANSATLANTICA SUMMER ICE	1 GAL
○	EUONYMUS JAPONICUS `MICROPHYLLA`	1 GAL
⊙	HELICTOTRICHON SEMPERVIRENS	1 GAL
○	HYDRANGEA QUERCIFOLIA	1 GAL
⬡	MAHONIA AQUIFOLIUM `COMPACTA`	1 GAL
⊙	NANDINA DOMESTICA `GULF STREAM` TM	1 GAL
⊙	PENNISETUM ALOPECUROIDES `HAMELN`	1 GAL
◔	POTENTILLA FRUTICOSA `ABBOTSWOOD`	1 GAL
⊕	PRUNUS LAUROCERASUS `OTTO LUYKEN`	1 GAL
⊛	SARCOCOCCA HOOKERANA HUMILIS	1 GAL
⊙	SARCOCOCCA RUSCIFOLIA	1 GAL
○	THUJA OCCIDENTALIS `EMERALD`	4 FT.
⊕	VIBURNUM DAVIDII	1 GAL
⊙	VIBURNUM TINUS `SPRING BOUQUET` COMPACTUM	1 GAL

SYMBOL	DESCRIPTION
1	0-1/4" COMPACTED GRAVEL
2	BENCH

Note: An automatic irrigation syste will be provided

0 20 40 60 feet

SCALE: 1" = 20'

NORTH

PREPARED BY

SDLA
SHAPIRO DIDWAY
LANDSCAPE ARCHITECTS
1204 SE WATER AVE. • PORTLAND, OR 97214 • 503.232.0520

PROFESSIONAL LICENSE

REGISTERED 382 STEVEN L. SHAPIRO OREGON LANDSCAPE ARCHITECT

PROJECT

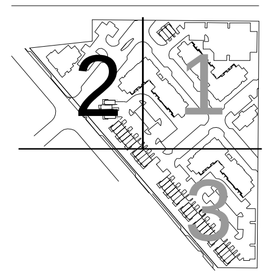
OREGON CITY LIVE/WORK

A LIVE/WORK APARTMENT AND TOWNHOME DEVELOPMENT

19896 BEAVERCREEK RD. OREGON CITY, OR

DRAWING LOG

KEY MAP



DRAWING PHASE

sheet title

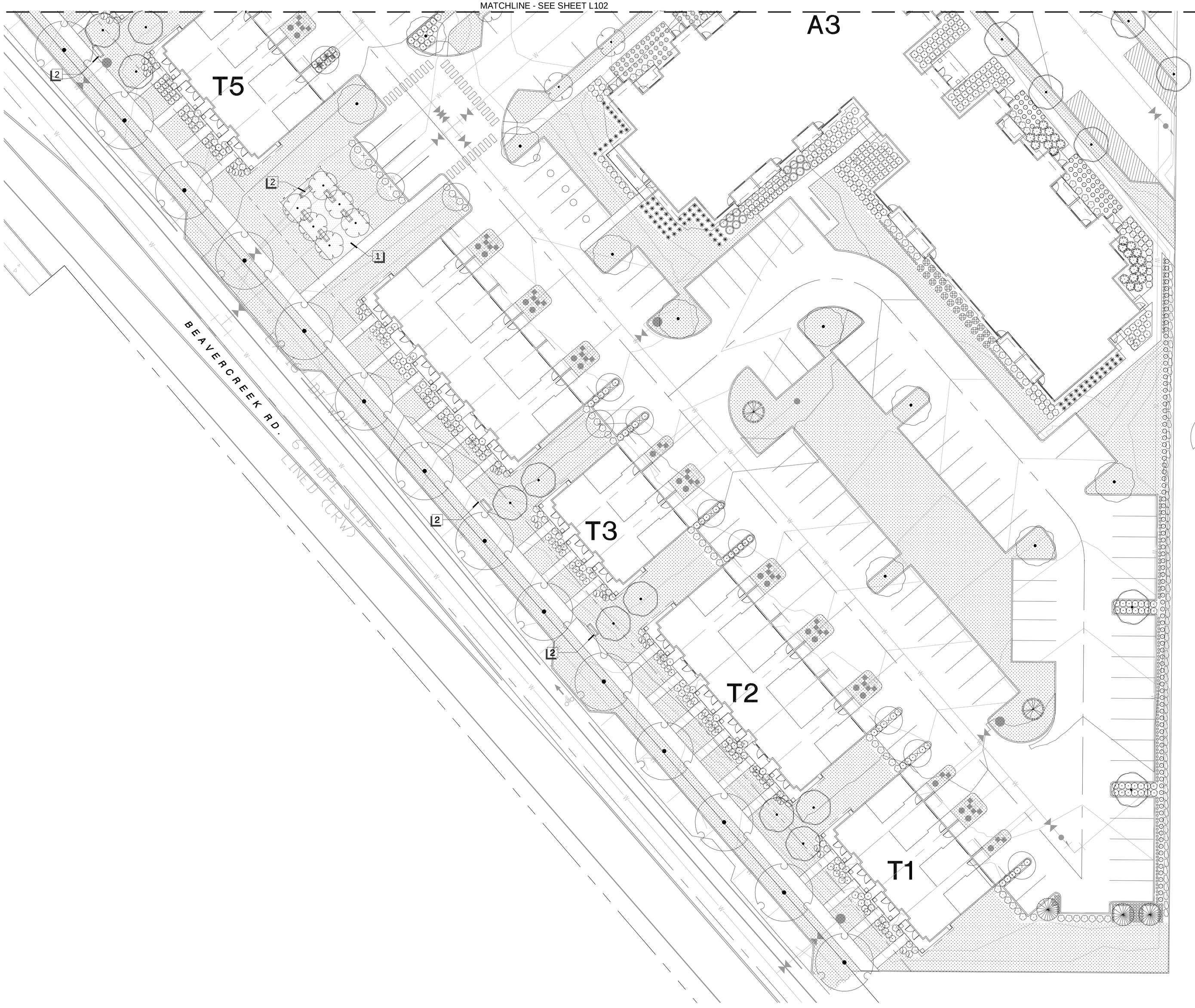
LANDCAPE PLAN

sheet number

L102

1.14.2014

MATCHLINE - SEE SHEET L102



PLANT SCHEDULE

TREES	BOTANICAL NAME
	ACER CIRCINATUM `PACIFIC FIRE`
	ACER GRISEUM
	CALOCEDRUS DECURRENS
	CARPINUS BETULUS `FASTIGIATA`
	CRATAEGUS LAEVIGATA `CRIMSON CLOUD`
	FRAXINUS ORNUS
	FRAXINUS OXYCARPA
	PRUNUS SARGENTII `COLUMNARIS`
	PYRUS CALLERYANA `GLEN`S FORM` TM
	QUERCUS ROBUR `FASTIGIATA`
	SEQUOIA SEMPERVIRENS
	ZELKOVA SERRATA `HALKA`

SHRUBS	BOTANICAL NAME
	CALAMAGROSTIS X ACUTIFLORA `KARL FOERSTER`
	CAREX MORROWII `AUREA-VARIEGATA`
	CHOISYA DUMOSA
	CORNUS SERICEA `KELSEYI`
	COTONEASTER DAMMERI `LOWFAST`
	DAPHNE TRANSATLANTICA SUMMER ICE
	EUONYMUS JAPONICUS `MICROPHYLLA`
	HELICTOTRICHON SEMPERVIRENS
	HYDRANGEA QUERCIFOLIA
	MAHONIA AQUIFOLIUM `COMPACTA`
	NANDINA DOMESTICA `GULF STREAM` TM
	PENNISETUM ALOPECUROIDES `HAMELN`
	POTENTILLA FRUTICOSA `ABBOTSWOOD`
	PRUNUS LAUROCERASUS `OTTO LUYKEN`
	SARCOCOCCA HOOKERANA HUMILIS
	SARCOCOCCA RUSCIFOLIA
	THUJA OCCIDENTALIS `EMERALD`
	VIBURNUM DAVIDII
	VIBURNUM TINUS `SPRING BOUQUET` COMPACTUM

SYMBOL	DESCRIPTION
1	0-1/4" COMPACTED GRAVEL
2	BENCH

Note: An automatic irrigation syste will be provided

0 20 40 60 feet

SCALE: 1" = 20'

NORTH

PREPARED BY

SDLA
SHAPIRO DIDWAY
LANDSCAPE ARCHITECTS
1204 SE WATER AVE. • PORTLAND, OR 97214 • 503.232.0520

PROFESSIONAL LICENSE

REGISTERED
382
Stephen L. Shapiro
STEVEN L. SHAPIRO
OREGON
LANDSCAPE ARCHITECT

PROJECT

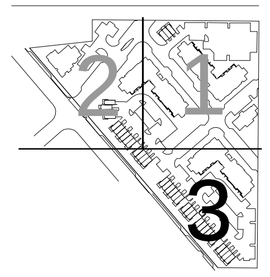
OREGON CITY LIVE/WORK

A LIVE/WORK APARTMENT AND TOWNHOME DEVELOPMENT

19896 BEAVERCREEK RD. OREGON CITY, OR

DRAWING LOG

KEY MAP



DRAWING PHASE

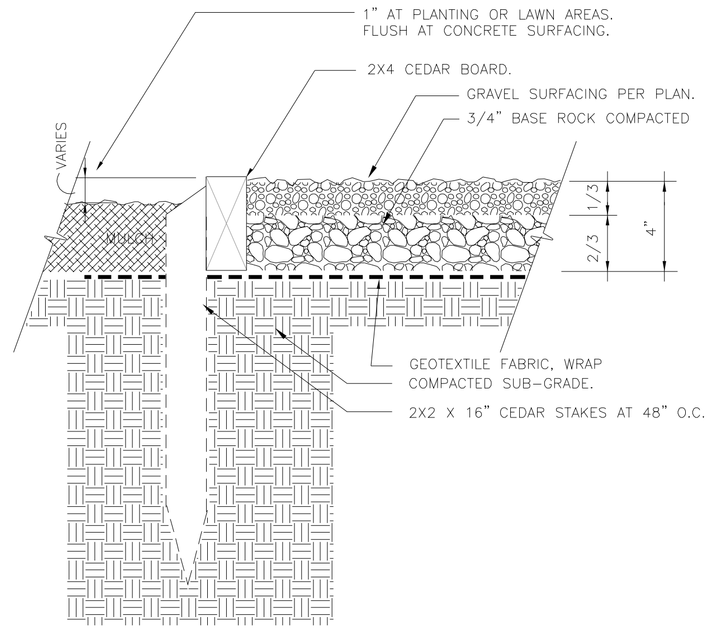
sheet title

LANDCAPE PLAN

sheet number

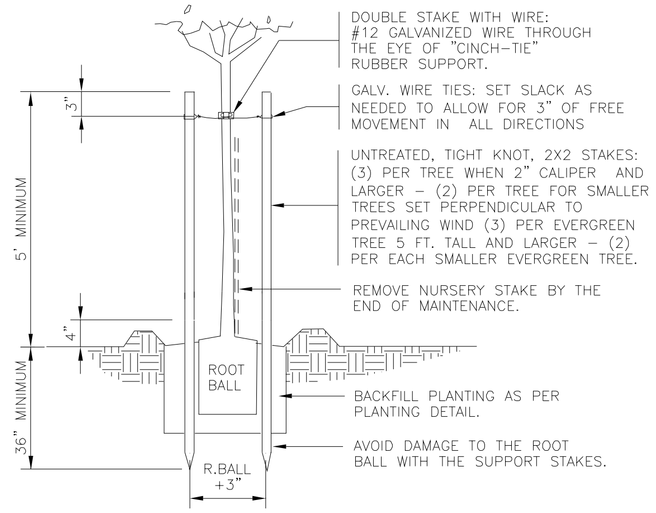
L103

1.14.2014

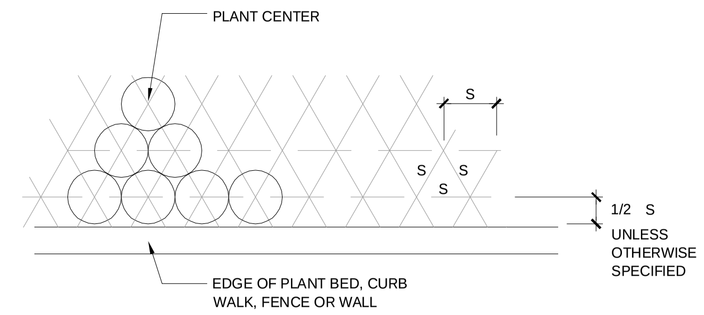


5 WOOD EDGE AT GRAVEL SURFACING

3" = 1'-0" 32 1543-01



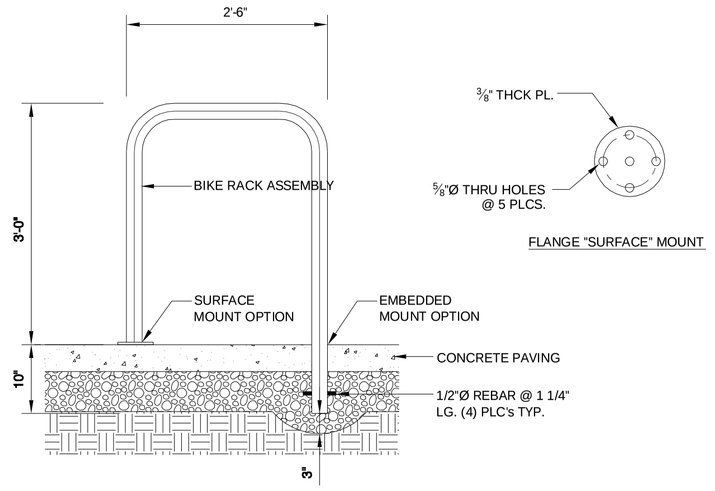
STAKING DETAIL



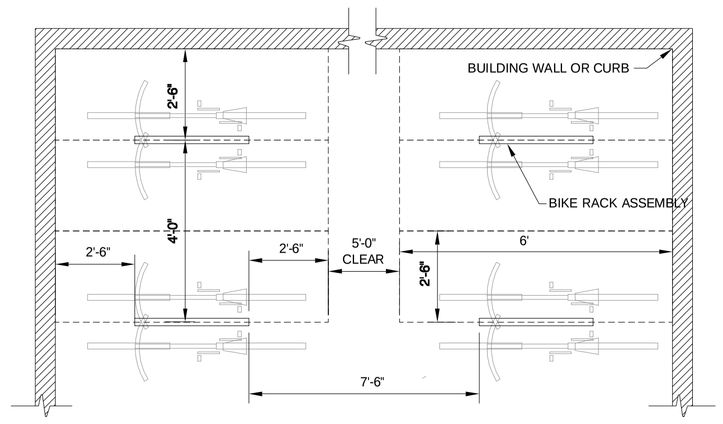
S = SPACING ON CENTER (O.C.) AS SHOWN ON PLANS

1 GROUNDCOVER SPACING

1/2" = 1'-0" 32 9333.83-01



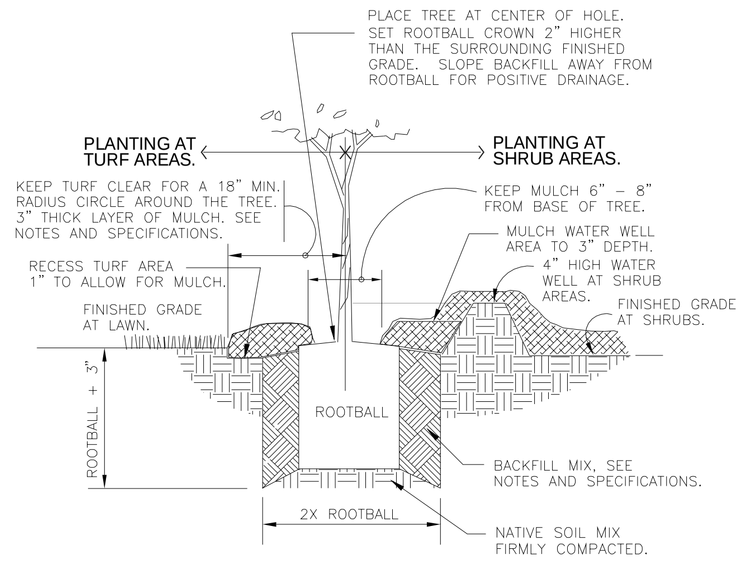
NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.



PLACEMENT AND SPACING GUIDE
NOT TO SCALE

6 BIKE RACK

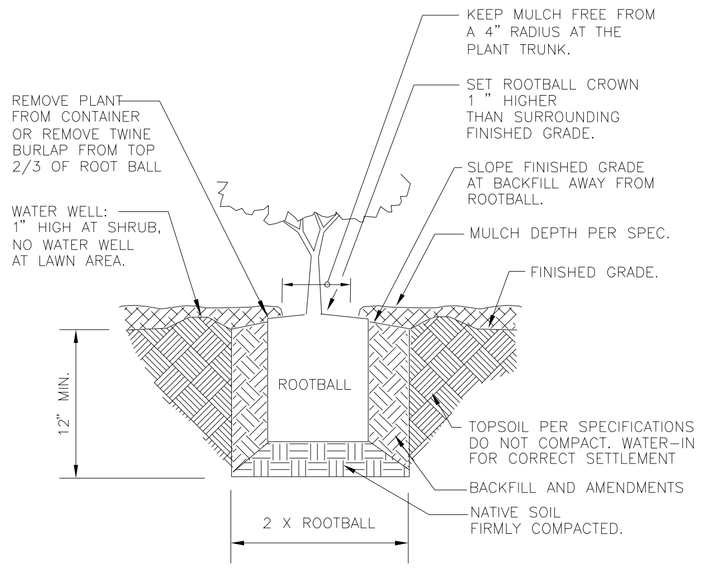
3/4" = 1'-0" 12 9313-04



PLANT PIT DETAIL

3 TREE PLANTING DOUBLE STAKE

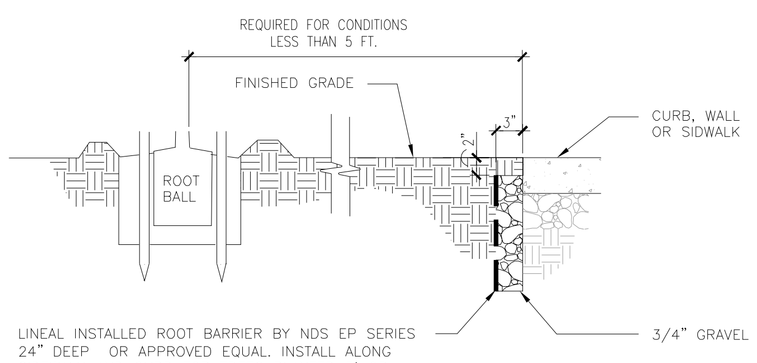
1" = 1'-0" 32 9343.19-03



NOTE: CHECK ROOTBALL FOR PRESENCE OF ROOT FLARE AT BASE OF TRUNK. REMOVE EXCESS SOIL OVER ROOT FLARE AND ADJUST DEPTH OF PLANTING HOLE TO ACCOMODATE REDUCED ROOTBALL DEPTH IF NEEDED. ROOT FLARE MUST BE VISIBLE ABOVE MULCH/SOIL/ROOTBALL.

2 SHRUB PLANTING

1" = 1'-0" 32 9333.13-01



LINEAL INSTALLED ROOT BARRIER BY NDS EP SERIES 24" DEEP OR APPROVED EQUAL. INSTALL ALONG SIDEWALK AND CURB FOR TREES PLANTED 5' OR CLOSER TO HARDSCAPE (MEASURED FROM BASE OF TRUNK). REFER TO DRAWINGS TO DETERMINE LENGTH OF MATERIAL REQUIRED. IF LENGTHS ARE NOT SPECIFIED REFER TO MANUFACTURER'S RECOMMENDATIONS

4 TREE ROOT BARRIER - LINEAR

1" = 1'-0" 32 9416-01

PREPARED BY

SDLA
SHAPIRO DIDWAY
LANDSCAPE ARCHITECTS
1204 SE WATER AVE. • PORTLAND, OR 97214 • 503.232.0520

PROFESSIONAL LICENSE

REGISTERED
382
STEVEN L. SHAPIRO
OREGON
LANDSCAPE ARCHITECT

PROJECT

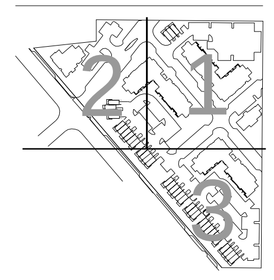
OREGON CITY
LIVE/WORK

A LIVE/WORK
APARTMENT AND
TOWNHOME
DEVELOPMENT

19896 BEAVERCREEK
RD. OREGON CITY, OR

DRAWING LOG

KEY MAP



DRAWING PHASE

sheet title

LANDCAPE
DETAILS

sheet number

L201

1.14.2014

HORIZ. 0 20 40 80
Scale In Feet

LEGEND

- 5 FOOT CANDLES
- 2.5 FOOT CANDLES
- 1 FOOT CANDLES
- 0.5 FOOT CANDLES
- 0.2 FOOT CANDLES
- 0.1 FOOT CANDLES

SYM	REVISION	DATE

PACE
An Engineering Advocacy Company
5000 Meadows Road
Lake Oswego, Oregon 97035
p. 503.597.3222 | f. 503.597.7655
Civil | Structural | Planning | Survey
paceengrs.com

PRELIMINARY

SITE LIGHTING

A LIVE/WORK APARTMENT AND TOWNHOME DEVELOPMENT

19896 BEAVERCREEK RD.
OREGON CITY, OR

SCALE:	DATE:
1"=40'	1/08/14
DESIGNED BY:	CHECKED BY:
AAR	DP

JOB NUMBER
13869

DWG NAME:
C5 SITE LIGHTING

SHEET C5 OF 4

FILE NAME: P:\P13\13869 - EVERGREEN HOUSING - BEAVERCREEK ROAD\CAD\SHEETS\C5 SITE LIGHTING.DWG
SAVE TIME: 1/21/2014 5:40:32 PM
PLOT TIME: 1/21/2014 5:42 PM
USER NAME: ANDREW REITER
XREF FILES: PACE34X22.

CSX2 LED
LED Area Luminaire

Catalog Number

Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements

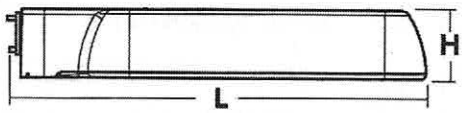
Introduction

The Contour® Series luminaires offer traditional square dayforms with softened edges for a versatile look that complements many applications.

The CSX2 combines the latest in LED technology with the familiar aesthetic of the Contour® Series for stylish, high-performance illumination that lasts. It is ideal for replacing traditional metal halide in area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Specifications

EPA:	1.2 ft² (0.11 m²)
Length:	35-3/8" (89.7 cm)
Width:	18-1/2" (46.9cm)
Height:	5-7/8" (14.9 cm)
Weight (max):	59 lbs (26.8 kg)



Ordering Information

EXAMPLE: CSX2 LED 120C 1000 40K T5M MVOLT SPA DDBXD

CSX2 LED 120C

Series	LEDs	Drive current	Color temperature	Distribution	Voltage	Mounting	Options	Finish (required)
CSX2 LED	120C 120 LEDs	700 700 mA 1000 1000 mA (1 A)	40K 4000K 50K 5000K	T2M Type II T3M Type III T4M Type IV T5M Type V TFTM Forward throw	MVOLT [1] 120 [1] 208 [1] 240 [1] 277 [1] 347 480	**Shipped included** SPA Square pole mounting RPA Round pole mounting **Shipped Separately** [2] SPUMBA Square pole universal mounting adaptor RPUMBA Round pole universal mounting adaptor	**Shipped installed** PER NEMA twist-lock receptacle only (no controls) DCR Dimmable and controllable via ROAM® (no controls) [3] DMG 0-10V dimming driver (no controls) [4] HS House-side shield [2] SF Single fuse (120, 277, 347V) [5] DF Double fuse (208, 240, 480V) [5] DS Dual switching [6,7] WTB Utility terminal block [8] UT Utility terminal block and closing screws [8] BL30 Bi-level switched dimming, 30% [7,9] BL50 Bi-level switched dimming, 50% [7,9] **Shipped separately** [2] VG Vandal guard BS Bird-deterrant spikes	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

Accessories

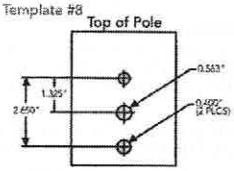
Ordered and shipped separately.

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) [10]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) [10]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) [10]
SC U	Shorting cap [10]
SPUMBA DDBXD U	Square pole universal mounting bracket adaptor (specify finish)
RPUMBA DDBXD U*	Round pole universal mounting bracket adaptor (specify finish)
CSX2HS U	House-side shields (includes 4 shields)
CSX2VG U	Vandal guard accessory
CSX2BS U	Bird-deterrent spikes accessory

For more control options, visit DTL and ROAM.

Drilling

Template #8



CSX2 shares a unique drilling pattern with the AERIS™ family. Specify this drilling pattern when specifying poles.

DM19AS	Single unit
DM29AS	2 at 90° *
DM28AS	2 at 180°
DM39AS	3 at 90° *
DM49AS	4 at 90° *
DM32AS	3 at 120° **

Example: SSA 20 4C DM19AS DDBXD

** Round pole requires 3.25" O.D. minimum.*

*** For round pole mounting (RPA) only.*

Tenon Mounting Slipfitter**

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	N/A	N/A	N/A	N/A
2-7/8"	AST25-190	AST25-280	N/A	AST25-320	N/A	N/A
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

NOTES

1. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options).
2. Also available as a separate accessory; see Accessories information at left.
3. Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Not available with 347 or 480V. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net.
4. Not available with 347 or 480V.
5. Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
6. Provides 50% dimming capability via two independent drivers, each operating half the luminaire. N/A with PER, DCR, DMG, WTB or UT.
7. Requires an additional switched line.
8. Not available with BL30 or BL50.
9. Dimming driver standard. MVOLT only. Not available with WTB, UT or DCR.
10. Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item. For 1000mA 347V or 480V PER, must order DLL127F 1.5 JU Photocell - SSL twist-lock (120-277V) as the receptacle is wired after the stepdown transformer.

LITHONIA LIGHTING

One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Actual performance may differ as a result of end-user environment and application. Actual wattage may differ by +/- 8% when operating between 120-480V +/- 10%. Contact factory for performance data on any configurations not shown here.

LEDs	Drive Current (mA)	Performance Package	System Watts	Dist. Type	40K (4000K, 70 CRI)					50K (5000K, 67 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
120C (120 LEDs)	700 mA	120C 700 --K	268W	T2M	26,094	3	0	4	97	28,107	3	0	4	105
				T3M	27,757	3	0	4	104	29,897	3	0	4	112
				T4M	27,658	3	0	4	103	29,792	3	0	5	111
				T5M	28,025	5	0	4	105	30,186	5	0	4	113
				TFTM	28,304	3	0	4	106	30,487	3	0	4	114
	1000 mA	120C 1000 --K	416W	T2M	34,700	4	0	4	83	37,406	4	0	5	90
				T3M	36,910	4	0	5	89	39,789	4	0	5	96
				T4M	36,780	3	0	5	88	39,649	4	0	5	95
				T5M	37,267	5	0	4	90	40,174	5	0	5	97
				TFTM	37,638	3	0	5	90	40,574	3	0	5	98

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	77°F	1.00
30°C	86°F	1.00
40°C	104°F	0.99

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the **CSX2 LED 120C platform in a 25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	0.94	0.90	0.83

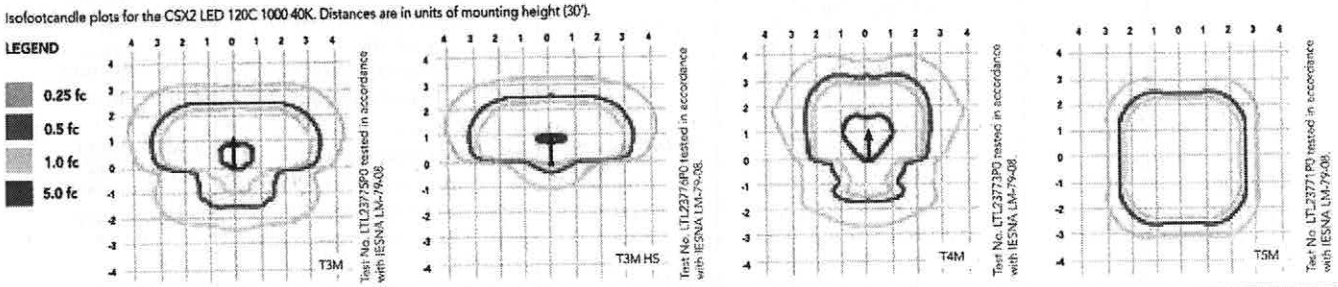
Electrical Load

Number of LEDs	Drive Current (mA)	System Watts	Current (A)					
			120	208	240	277	347	480
120C	700	268W	2.643	1.511	1.318	1.159	0.923	0.674
	1000	416W	4.135	2.397	2.111	1.886	1.527	1.210

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's CSX2 homepage.

Isofootcandle plots for the CSX2 LED 120C 1000 40K. Distances are in units of mounting height (30').



FEATURES & SPECIFICATIONS

INTENDED USE
The Contour Series LED area luminaire is ideal for streets, walkways, parking lots, and surrounding areas that call for high-performance LED lighting in a transitional dayform.

CONSTRUCTION
Single-piece die cast housing has a unique flow-through design that allows for optimized thermal management through convective cooling. A metallic screen covers the top of the housing, preventing debris build-up while allowing natural cleaning of the heat sinks. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver(s) and electronics are thermally isolated from the light engines, ensuring long life. Housing is completely sealed against moisture and environmental contaminants.

FINISH
Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling.

OPTICS
Precision-molded acrylic lenses provide optimal luminaire spacing and improved uniformity. Lenses are indexed to the circuit board to ensure consistent optical alignment and delivering repeatable photometric performance. Light engines are available in standard 4000K (70 CRI) or optional 5000K (67 CRI) configurations. The CSX2 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL
Light engines consist of 120 high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (100,000 hrs at 40°C, L70). Class 1 electronic driver designed to have a power factor >90%, THD <20%, with an expected life of 100,000 hours with <1% failure rate. Easily-serviceable surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

INSTALLATION
Integral arm provides easy installation to a pole and assists in alignment and leveling. Secure connection withstands up to 2.0 G vibration load rating per ANSI C136.31. The CSX2 utilizes the AERIS™ series pole drilling pattern for SPA and RPA options.

LISTINGS
CSA Certified to U.S. and Canadian standards. Light engines are IP66 rated. Luminaire is IP65 rated. **U.S. Patent No. D632830. U.S. Patent No. D653,382 S.**

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY
Five year limited warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

Note: Specifications subject to change without notice.

Visual - Template Tool

AcuityBrands.

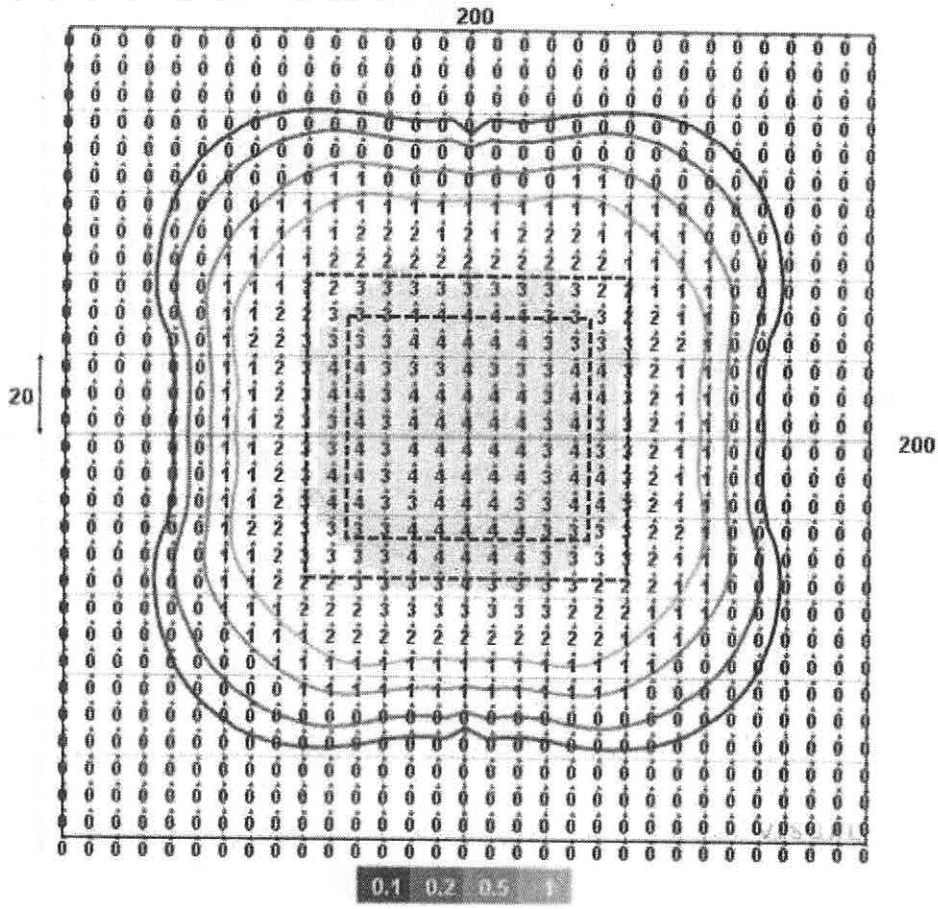
Design Information

Tuesday, January 21, 2014

Project
Description

Name
Company
Phone
Email

[E] - CSX2 LED 120C 1000 40K T5M



[E] - CSX2 LED 120C 1000 40K T5M MVOLT

Manufacturer		Lithonia Lighting Configuration	Single
Lamp Lumens	37267	Orientation	Single
Lamp Quantity	1	Mounting Height	20
Light Loss Factor	1	Arm Length	1
Input Power	416	Tilt	0
Max Illuminance	4	Area > 3fc	5400

Visual - Template Tool

AcuityBrands.

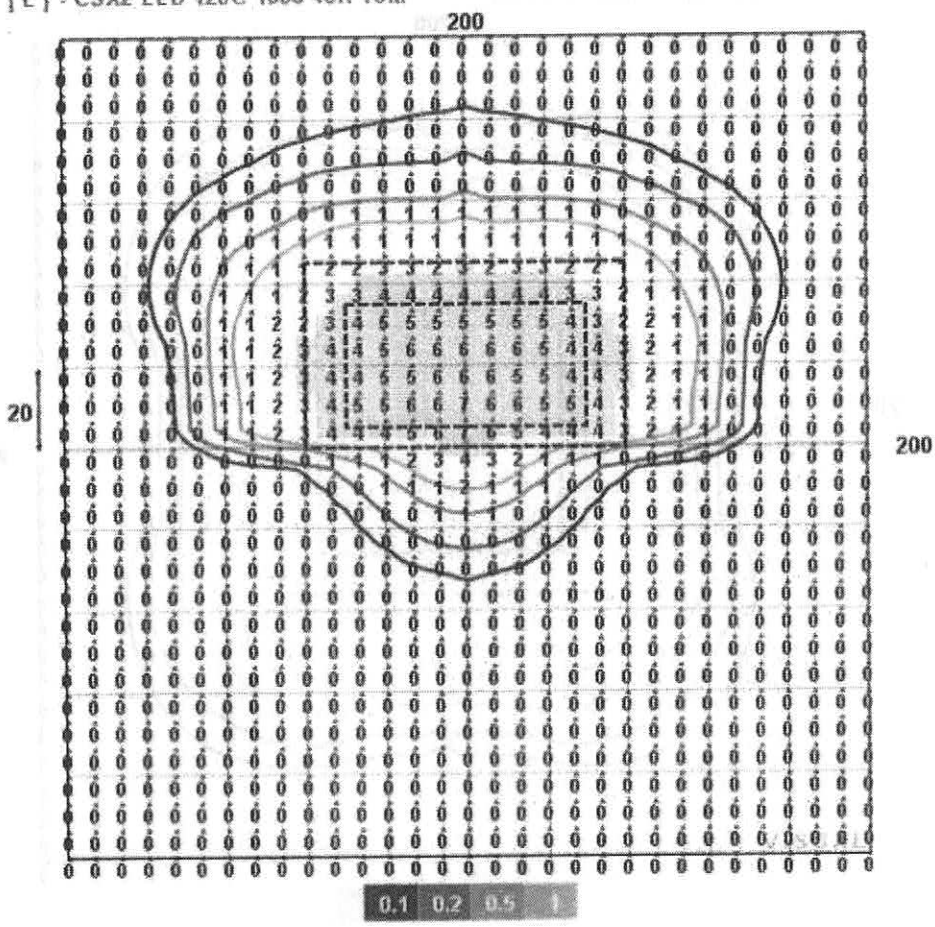
Tuesday, January 21, 2014

Design Information

Project
Description

Name
Company
Phone
Email

[E] - CSX2 LED 120C 1000 40K T5M



[E] - CSX2 LED 120C 1000 40K T5M MVOLT HS

Manufacturer	Lithonia Lighting Configuration		Single
Lamp Lumens	23604	Orientation	Single
Lamp Quantity	1	Mounting Height	20
Light Loss Factor	1	Arm Length	1
Input Power	416	Tilt	0
Max Illuminance	7	Area > 3fc	3100

D-Series Size 1
LED Area Luminaire

Catalog Number

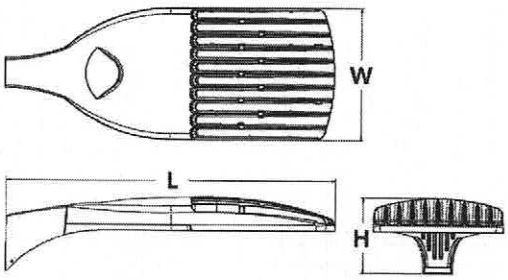
Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements

Specifications

EPA:	1.2 ft² (0.11 m²)
Length:	33" (83.8 cm)
Width:	13" (33.0 cm)
Height:	7-1/2" (19.0 cm)
Weight (max):	27 lbs (12.2 kg)



Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.

The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing 100 – 400W metal halide in pedestrian and area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

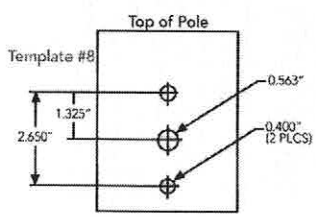
Ordering Information

EXAMPLE: DSX1 LED 60C 1000 40K T3M MVOLT SPA DDBXD

DSX1 LED

Series	LEDs	Drive current	Color temperature	Distribution	Voltage	Mounting	Control options	Other options	Finish (required)
DSX1 LED	**Forward optics** 30C 30 LEDs (one engine) 40C 40 LEDs (two engines) 60C 60 LEDs (two engines) **Rotated optics** 60C 60 LEDs (two engines)	530 530 mA 700 700 mA 1000 1000 mA (1 A)	30K 3000K (80 CRI min.) 40K 4000K (70 CRI min.)[1] 50K 5000K (67 CRI)	T1S Type I short T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium T5VS Type V very short T5S Type V short T5M Type V medium T5W Type V wide	MVOLT[2] 120[2] 208[2] 240[2] 277[2] 347[3] 480[3]	**Shipped included** SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMBA Square pole universal mounting adaptor[4] RPUMBA Round pole universal mounting adaptor[4]	**Shipped installed** PER NEMA twist-lock receptacle only (no controls)[5] DMG 0-10V dimming driver (no controls)[6] DCR Dimmable and controllable via ROAM® (no controls)[7] DS Dual switching[8,9] PIR Motion sensor, 8-15' mounting height[10] PIRH Motion sensor, 15-30' mounting height[10] BL30 Bi-level switched dimming, 30%[6,8,11] BL50 Bi-level switched dimming, 50%[6,8,11]	**Shipped installed** HS House-side shield[12] WTB Utility terminal block[13] SF Single fuse (120, 277, 347V)[14] DF Double fuse (208, 240, 480V)[14] TLS Tool-less entry trigger latch[15] L90 Left rotated optics[16] R90 Right rotated optics[16]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

Drilling



DSX1 shares a unique drilling pattern with the AERIS™ family. Specify this drilling pattern when specifying poles, per the table below.

DM19AS	Single unit	DM29AS	2 at 90°*
DM28AS	2 at 180°	DM39AS	3 at 90°*
DM49AS	4 at 90°*	DM32AS	3 at 120° **

Example: SSA 20 4C DM19AS DDBXD

Visit Lithonia Lighting's POLES CENTRAL to see our wide selection of poles, accessories and educational tools.

**Round pole top must be 3.25" O.D. minimum.*
***For round pole mounting (RPA) only*

Accessories

Ordered and shipped separately.

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V)[17]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V)[17]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V)[17]
SC U	Shorting cap[17]
DSX1HS 30C U	House-side shield for 30 LED unit
DSX1HS 40C U	House-side shield for 40 LED unit
DSX1HS 60C U	House-side shield for 60 LED unit
PUMBA DDBXD U*	Square and round pole universal mounting bracket adaptor (specify finish)

For more control options, visit DTL and ROAM online.

Tenon Mounting Slipfitter**

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	N/A	N/A	N/A	N/A
2-7/8"	AST25-190	AST25-280	N/A	AST25-320	N/A	N/A
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-380	AST35-490

NOTES

1. Configured with 4000K (40K) provides the shortest lead times. Consult factory for 3000K (30K) and 5000K (50K) lead times.
2. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options).
3. Not available with single board, 530mA product (30C 530). N/A with 1000 mA. Not available with DMG, DCR, BL30, BL50, WTB, or TLS.
4. Available as a separate combination accessory: PUMBA (finish) U.
5. Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Not available with DS option.
6. Not available with 347 or 480V.
7. Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Not available with 347 or 480V. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net. N/A with BL30, BL50, DS, TLS, PIR or PIRH.
8. Requires 40C or 60C. Provides 50/50 luminaire operation via two independent drivers on two separate circuits. N/A with PER, DCR, WTB, PIR, or PIRH.
9. Requires an additional switched circuit.
10. PIR specifies the SensorSwitch SBR-10-ODP control; PIRH specifies the SensorSwitch SBR-6-ODP control; see Motion Sensor Guide for details. Dimming driver standard. Not available with DCR.
11. Dimming driver standard. MVOLT only. Not available with DCR or WTB.
12. Also available as a separate accessory; see Accessories information.
13. WTB not available with BL30, BL50, DS, PIR or PIRH. N/A 347v or 480v.
14. Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
15. With TLS option, the luminaire is no longer IP65 rated. Not available with BL30, BL50, DCR, PIR or PIRH. N/A 347v or 480v.
16. Available with 60 LEDs (60C option) only.
17. Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item from Acuity Brands Control.

LITHONIA LIGHTING
One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Actual performance may differ as a result of end-user environment and application. Actual wattage may differ by +/- 8% when operating between 120-480V +/-10%. Contact factory for performance data on any configurations not shown here.

LEDs	Drive Current (mA)	Performance Package	System Watts	Dist. Type	30K (3000K, 80 minimum CRI)					40K (4000K, 70 minimum CRI)					50K (5000K, 67 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
30C (30 LEDs)	700 mA	30C 700 --K	68 W	T1S	5,290	1	0	1	78	6,524	2	0	2	96	7,053	2	0	2	104
				T2S	5,540	1	0	1	81	6,833	2	0	2	100	7,387	2	0	2	109
				T2M	5,360	1	0	2	79	6,611	2	0	2	97	7,147	2	0	2	105
				T3S	5,479	1	0	1	81	6,757	1	0	2	99	7,305	2	0	2	107
				T3M	5,452	1	0	2	80	6,724	2	0	2	99	7,269	2	0	2	107
				T4M	5,461	1	0	2	80	6,736	2	0	2	99	7,282	2	0	2	107
				TFTM	5,378	1	0	2	79	6,633	1	0	2	98	7,171	1	0	2	105
				T5VS	5,708	2	0	0	84	7,040	3	0	0	104	7,611	3	0	1	112
				T5S	5,639	2	0	0	83	6,955	2	0	0	102	7,519	3	0	0	111
				T5M	5,710	3	0	1	84	7,042	3	0	1	104	7,613	3	0	2	112
				T5W	5,551	3	0	1	82	6,847	3	0	2	101	7,401	3	0	2	109
	1000 mA	30C 1000 --K	105 W	T1S	7,229	2	0	2	69	9,168	2	0	2	87	9,874	2	0	2	94
				T2S	7,572	2	0	2	72	9,603	2	0	2	91	10,342	2	0	2	98
				T2M	7,325	2	0	2	70	9,291	2	0	2	88	10,005	2	0	3	95
				T3S	7,488	2	0	2	71	9,496	2	0	2	90	10,227	2	0	2	97
				T3M	7,451	2	0	2	71	9,450	2	0	2	90	10,177	2	0	2	97
				T4M	7,464	2	0	2	71	9,467	2	0	2	90	10,195	2	0	2	97
				TFTM	7,351	1	0	2	70	9,323	2	0	2	89	10,040	2	0	3	96
				T5VS	7,801	3	0	1	74	9,894	3	0	1	94	10,655	3	0	1	101
				T5S	7,803	3	0	2	74	9,774	3	0	1	93	10,526	3	0	1	100
				T5M	7,707	3	0	0	73	9,897	3	0	2	94	10,658	4	0	2	102
				T5W	7,586	3	0	2	72	9,621	4	0	2	92	10,363	4	0	2	99
40C (40 LEDs)	700 mA	40C 700 --K	89 W	T1S	6,876	2	0	2	77	8,639	2	0	2	97	9,345	2	0	2	105
				T2S	7,202	2	0	2	81	9,049	2	0	2	102	9,788	2	0	2	110
				T2M	6,968	2	0	2	78	8,755	2	0	2	98	9,469	2	0	3	106
				T3S	7,122	2	0	2	80	8,948	2	0	2	101	9,679	2	0	2	109
				T3M	7,088	2	0	2	80	8,905	2	0	2	100	9,632	2	0	2	108
				T4M	7,100	2	0	2	80	8,920	2	0	2	100	9,649	2	0	2	108
				TFTM	6,992	1	0	2	79	8,785	2	0	2	99	9,502	2	0	2	107
				T5VS	7,421	3	0	0	83	9,323	3	0	1	105	10,085	3	0	1	113
				T5S	7,331	2	0	0	82	9,210	3	0	1	103	9,962	3	0	1	112
				T5M	7,423	3	0	2	83	9,326	3	0	2	105	10,087	4	0	2	113
				T5W	7,216	3	0	2	81	9,066	4	0	2	102	9,807	4	0	2	110
	1000 mA	40C 1000 --K	138 W	T1S	9,521	2	0	2	69	11,970	2	0	2	87	12,871	3	3	0	93
				T2S	9,972	2	0	2	72	12,558	3	0	3	91	13,481	3	0	3	98
				T2M	9,648	2	0	3	70	12,149	3	0	3	88	13,043	3	0	3	95
				T3S	9,862	2	0	2	71	12,418	2	0	2	90	13,331	2	0	2	97
				T3M	9,814	2	0	2	71	12,358	3	0	3	90	13,267	3	0	3	96
				T4M	9,831	2	0	2	71	12,379	2	0	3	90	13,290	2	0	3	96
				TFTM	9,681	2	0	2	70	12,191	2	0	3	88	13,087	2	0	3	95
				T5VS	10,275	3	0	1	74	12,937	3	0	1	94	13,890	4	0	1	101
				T5S	10,150	3	0	1	74	12,782	3	0	1	93	13,721	3	0	1	99
				T5M	10,278	4	0	2	74	12,942	4	0	2	94	13,894	4	0	2	101
				T5W	9,991	4	0	2	72	12,582	4	0	2	91	13,507	4	0	2	98
60C (60 LEDs)	700 mA	60C 700 --K	131 W	T1S	10,226	2	0	2	78	12,871	3	0	3	98	13,929	3	0	3	106
				T2S	10,711	2	0	2	82	13,481	3	0	3	103	14,589	3	0	3	111
				T2M	10,363	2	0	3	79	13,043	3	0	3	100	14,115	3	0	3	108
				T3S	10,592	2	0	2	81	13,331	2	0	2	102	14,427	3	0	3	110
				T3M	10,541	2	0	2	80	13,267	3	0	3	101	14,357	3	0	3	110
				T4M	10,559	2	0	2	81	13,290	2	0	3	101	14,382	3	0	3	110
				TFTM	10,398	2	0	3	79	13,087	2	0	3	100	14,163	2	0	3	108
				T5VS	11,036	3	0	1	84	13,890	4	0	4	106	15,032	4	0	1	115
				T5S	10,902	3	0	1	83	13,721	3	0	1	105	14,849	4	0	1	113
				T5M	11,039	4	0	2	84	13,894	4	0	2	106	15,036	4	0	2	115
				T5W	10,732	4	0	2	82	13,507	4	0	2	103	14,617	4	0	2	112
	1000 mA	60C 1000 --K	209 W	T1S	14,017	3	0	3	67	17,632	3	0	3	84	19,007	3	0	3	91
				T2S	14,681	3	0	3	70	18,467	3	0	3	88	19,908	3	0	3	95
				T2M	14,204	3	0	3	68	17,867	3	0	3	85	19,260	3	0	3	92
				T3S	14,518	3	0	3	69	18,262	3	0	3	87	19,687	3	0	3	94
				T3M	14,448	3	0	3	69	18,173	3	0	4	87	19,591	3	0	4	94
				T4M	14,473	3	0	3	69	18,205	3	0	3	87	19,625	3	0	4	94
				TFTM	14,253	2	0	3	68	17,928	3	0	4	86	19,326	3	0	4	92
				T5VS	15,127	4	0	1	72	19,028	4	0	1	91	20,512	4	0	1	98
				T5S	14,943	4	0	1	71	18,797	4	0	1	90	20,263	4	0	1	97
				T5M	15,131	4	0	2	72	19,033	4	0	2	91	20,517	5	0	3	98
				T5W	14,710	4	0	2	70	18,503	5	0	3	89	19,946	5	0	3	95

Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	**77°F**	**1.00**
30°C	86°F	1.00
40°C	104°F	0.99

Electrical Load

Number of LEDs	Drive Current (mA)	System Watts	Current (A) 120	208	240	277	347	480
30	530	52	0.52	0.30	0.26	0.23	—	—
	700	68	0.68	0.39	0.34	0.30	0.24	0.17
	1000	105	1.03	0.59	0.51	0.45	—	—
40	530	68	0.67	0.39	0.34	0.29	0.23	0.17
	700	89	0.89	0.51	0.44	0.38	0.31	0.22
	1000	138	1.35	0.78	0.67	0.58	—	—
60	530	99	0.97	0.56	0.48	0.42	0.34	0.24
	700	131	1.29	0.74	0.65	0.56	0.45	0.32
	1000	209	1.98	1.14	0.99	0.86	—	—

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

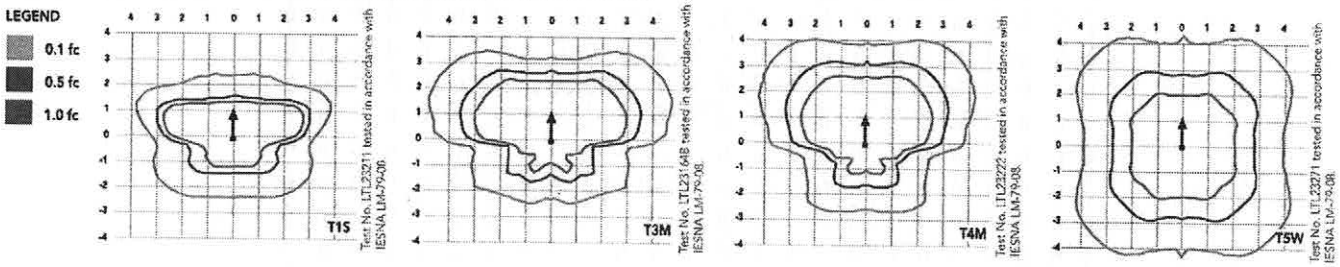
To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	DSX1 LED 60C 1000			
	1.0	0.95	0.93	0.88
	DSX1 LED 60C 700			
	1.0	0.99	0.98	0.96

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Area Size 1 homepage.

Isofootcandle plots for the DSX1 LED 60C 1000 40K. Distances are in units of mounting height (20').



FEATURES & SPECIFICATIONS

INTENDED USE
The sleek design of the D-Series Size 1 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and streetscapes.

CONSTRUCTION
Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (1.2 ft²) for optimized pole wind loading.

FINISH
Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

OPTICS
Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in standard 4000K (70 minimum CRI) or optional 3000K (80 minimum CRI) or 5000K (67 CRI) configurations. The D-Series Size 1 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL
Light engine configurations consist of 30, 40 or 60 high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L96/100,000 hours at 25°C). Class 1 electronic drivers are designed to have a power factor >90%, THD <20%, and an expected life of 100,000 hours with <1% failure rate. Easily serviceable 10kV or 6kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

INSTALLATION
Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 1 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 1 utilizes the AERIS™ series pole drilling pattern. Optional terminal block, tool-less entry, and NEMA photocontrol receptacle are also available.

LISTINGS
CSA certified to U.S. and Canadian standards. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY
Five-year limited warranty. Full warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Specifications subject to change without notice.

Visual - Template Tool

AcuityBrands.

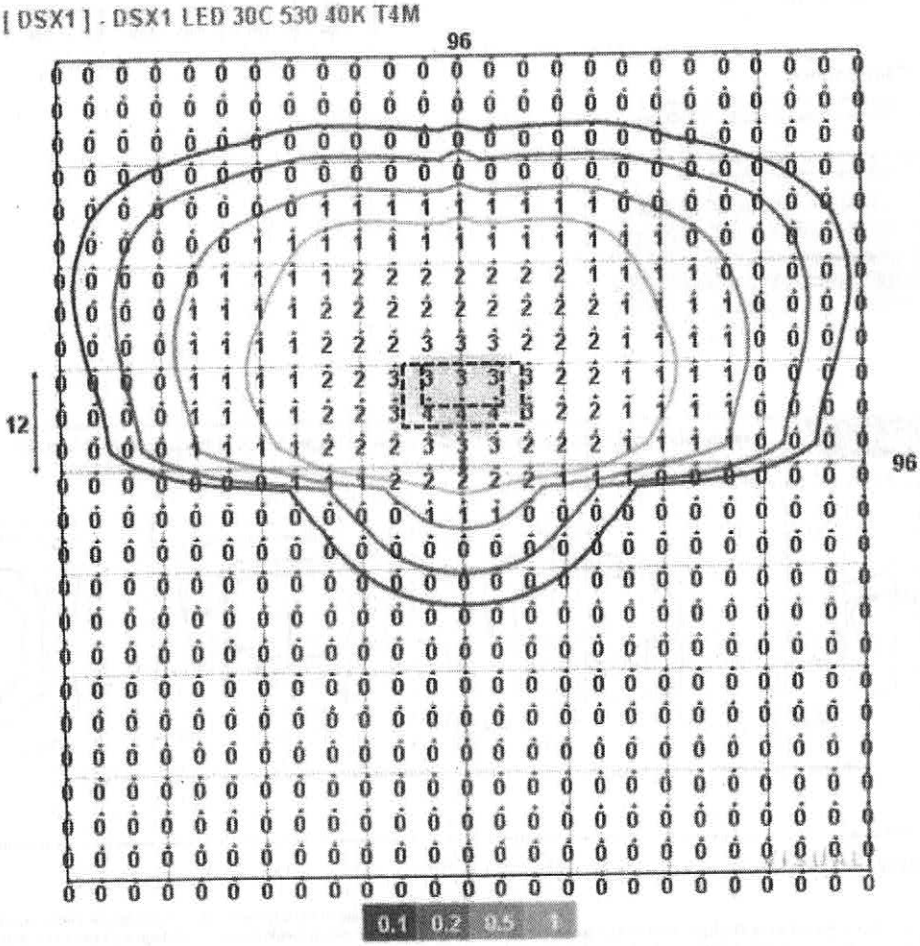
Tuesday, January 21, 2014

Design Information

Project
Description

Name
Company
Phone
Email

[DSX1] - DSX1 LED 30C 530 40K T4M



[DSX1] - DSX1 LED 30C 530 40K T4M MVOLT HS

Manufacturer		Lithonia Lighting Configuration	Single
Lamp Lumens	3872	Orientation	Single
Lamp Quantity	1	Mounting Height	12
Light Loss Factor	1	Arm Length	1
Input Power	52	Tilt	0
Max Illuminance	4	Area > 3fc	127

D-Series Size 2
LED Wall Luminaire

Catalog Number

Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements

d"series

Introduction

The D-Series Wall luminaire is a stylish, fully integrated LED solution for building-mount applications. It features a sleek, modern design and is carefully engineered to provide long-lasting, energy-efficient lighting with a variety of optical and control options for customized performance.

With an expected service life of over 20 years of nighttime use and up to 76% in energy savings over comparable 400W metal halide luminaires, the D-Series Wall is a reliable, low-maintenance lighting solution that produces sites that are exceptionally illuminated.

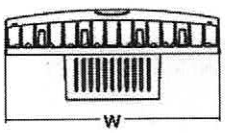
Specifications

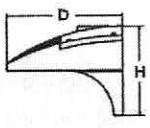
Luminaire

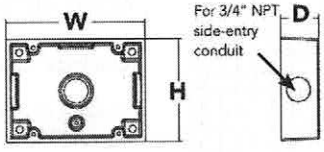
Width:	18-1/2" (47.0 cm)	**Weight:**	21 lbs (9.5 kg)
Depth:	10" (25.4 cm)		
Height:	7-5/8" (19.4 cm)		

Back Box (BBW)

Width:	5-1/2" (14.0 cm)	**BBW Weight:**	1 lbs (0.5 kg)
Depth:	1-1/2" (3.8 cm)		
Height:	4" (10.2 cm)		







Ordering Information

EXAMPLE: DSXW2 LED 30C 700 40K T3M MVOLT DDBTXD

DSXW2 LED

Series	LEDs	Drive Current	Color temperature	Distribution	Voltage	Mounting	Control Options	Other Options	Finish *(required)*
DSXW2 LED	20C 20 LEDs (two engines) 30C 30 LEDs (three engines)	350 350 mA 530 530 mA 700 700 mA 1000 1000 mA (1 A)	30K 3000K 40K 4000K 50K 5000K	T2S Type II Short T2M Type II Medium T3S Type III Short T3M Type III Medium T4M Type IV Medium TFTM Forward Throw Medium	MVOLT[1] 120[1] 208[1] 240[1] 277[1] 347[2] 480[2]	**Shipped included** (blank) Surface mounting bracket **Shipped separately[3]** BBW Surface-mounted back box (for conduit entry)	**Shipped installed** PE Photoelectric cell, button type[4] PER NEMA twist-lock receptacle only (no controls) DMG 0-10V dimming driver (no controls) DCR Dimmable and controllable via ROAM® (no controls)[5] PIRH 180° motion/ambient light sensor, 15-30' mtg ht[6]	**Shipped installed** SF Single fuse (120, 277, 347V)[7] DF Double fuse (208, 240, 480V)[7] HS House-side shield[3] SPD Separate surge protection[9] **Shipped separately** BSW Bird-deterrent spikes[3] WG Wire guard[3] VG Vandal guard[3]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DSSXD Sandstone DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white DSSTXD Textured sandstone

NOTES

1. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options), or photocontrol (PE option).
2. Available with 30 LED/700mA options only (DSXW2 LED 30C 700).
3. Also available as a separate accessory; see Accessories information.
4. Photocontrol (PE) requires 120, 208, 240 or 277 voltage option. Not available with motion/ambient light sensors (PIR or PIRH).
5. Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Not available with 347 or 480V. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net.
6. Specifies the Sensor Switch SBR-6-ODP control; see Motion Sensor Guide for details. Includes ambient light sensor. Not available with "PE" option (button type photocell). Dimming driver standard.
7. Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
8. Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item.
9. See the electrical section on page 2 for more details.

Accessories

Ordered and shipped separately.

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V)[1]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V)[1]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V)[1]
SC U	Shorting cap[1]
DSXWHS U	House-side shield (one per light engine)
DSXWBSW U	Bird-deterrent spikes
DSXW2WG U	Wire guard accessory
DSXW2VG U	Vandal guard accessory
DSXW2BBW DDBXD U	Back box accessory (specify finish)

LITHONIA LIGHTING

One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Actual performance may differ as a result of end-user environment and application. Actual wattage may differ by +/- 8% when operating between 120-480V +/- 10%. Contact factory for performance data on any configurations not shown here.

LEDs	Drive Current (mA)	Performance Package	System Watts	Dist. Type	40K (4000K, 70 CRI)					50K (5000K, 65 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
20C (20 LEDs)	530	20C 530 --K	36 W	T2S	3,533	1	0	1	98	3,860	1	0	1	107
				T2M	3,437	1	0	1	95	3,755	1	0	1	104
				T3S	3,489	1	0	1	97	3,811	1	0	1	106
				T3M	3,545	1	0	2	98	3,873	1	0	2	108
				T4M	3,498	1	0	1	97	3,822	1	0	1	106
				TFTM	3,495	1	0	1	97	3,819	1	0	1	106
	700	20C 700 --K	47 W	T2S	4,371	1	0	1	93	4,776	1	0	1	102
				T2M	4,252	1	0	1	90	4,647	1	0	2	99
				T3S	4,316	1	0	1	92	4,716	1	0	1	100
				T3M	4,386	1	0	2	93	4,793	1	0	2	102
				T4M	4,328	1	0	1	92	4,729	1	0	2	101
				TFTM	4,324	1	0	1	92	4,725	1	0	2	101
	1000	20C 1000 --K	73 W	T2S	5,914	1	0	1	81	6,462	1	0	1	89
				T2M	5,754	1	0	2	79	6,287	2	0	2	86
				T3S	5,839	1	0	1	80	6,380	1	0	2	87
				T3M	5,935	1	0	2	81	6,484	1	0	2	89
				T4M	5,855	1	0	2	80	6,398	1	0	2	88
				TFTM	5,851	1	0	2	80	6,393	1	0	2	88
30C (30 LEDs)	530	30C 530 --K	54 W	T2S	5,280	1	0	1	98	5,769	1	0	1	107
				T2M	5,137	1	0	2	95	5,613	1	0	2	104
				T3S	5,214	1	0	1	97	5,696	1	0	1	105
				T3M	5,298	1	0	2	98	5,789	1	0	2	107
				T4M	5,228	1	0	2	97	5,712	1	0	2	106
				TFTM	5,223	1	0	2	97	5,707	1	0	2	106
	700	30C 700 --K	71 W	T2S	6,513	1	0	1	92	7,118	2	0	2	100
				T2M	6,337	2	0	2	89	6,925	2	0	2	98
				T3S	6,431	1	0	2	91	7,028	1	0	2	99
				T3M	6,536	1	0	2	92	7,143	2	0	3	101
				T4M	6,449	1	0	2	91	7,047	1	0	2	99
				TFTM	6,444	1	0	2	91	7,042	1	0	2	99
	1000	30C 1000 --K	109 W	T2S	8,697	2	0	2	80	9,501	2	0	2	87
				T2M	8,462	2	0	2	78	9,244	2	0	2	85
				T3S	8,588	1	0	2	79	9,381	2	0	2	86
				T3M	8,728	2	0	3	80	9,534	2	0	3	87
				T4M	8,611	1	0	2	79	9,407	2	0	2	86
				TFTM	8,604	2	0	2	79	9,399	2	0	2	86

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	77°F	1.00
30°C	86°F	1.00
40°C	104°F	0.98

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the DSXW2 LED 30C 1000 platform in a 25°C ambient, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	0.95	0.92	0.87

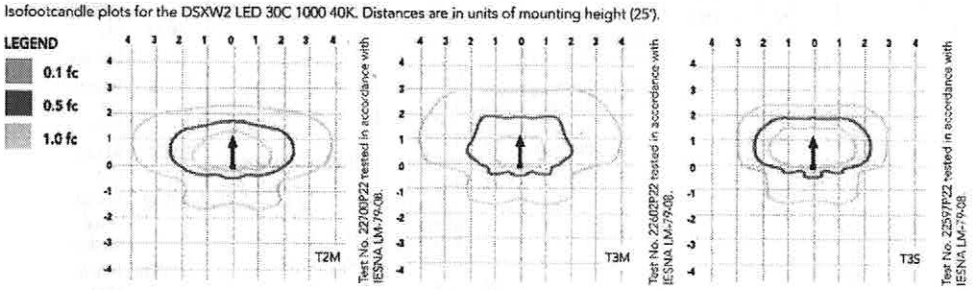
Electrical Load

LEDs	Drive Current (mA)	System Watts	Current (A) 120	208	240	277	347	480
20C	350	25 W	0.23	0.13	0.12	0.10	-	-
	530	36 W	0.33	0.19	0.17	0.14	-	-
	700	47 W	0.44	0.25	0.22	0.19	-	-
	1000	73 W	0.68	0.39	0.34	0.29	-	-
30C	350	36 W	0.33	0.19	0.17	0.14	-	-
	530	54 W	0.50	0.29	0.25	0.22	-	-
	700	71 W	0.66	0.38	0.33	0.28	0.23	0.16
	1000	109 W	1.01	0.58	0.50	0.44	-	-

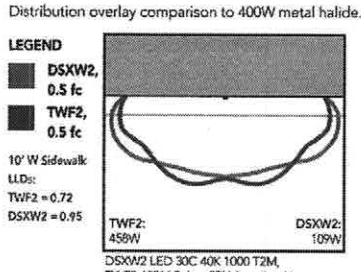
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Wall Size 2 homepage.

Isofootcandle plots for the DSXW2 LED 30C 1000 40K. Distances are in units of mounting height (25').



Distribution overlay comparison to 400W metal halide.



DSXW2 LED 30C 40K 1000 T2M, TWF2 400M Pulse, 25' Mounting Ht

FEATURES & SPECIFICATIONS

INTENDED USE
The energy savings, long life and easy-to-install design of the D-Series Wall Size 2 make it the smart choice for building-mounted doorway and pathway illumination for nearly any facility.

CONSTRUCTION
Two-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance. The LED driver is mounted to the door to thermally isolate it from the light engines for low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65).

FINISH
Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in textured and non-textured finishes.

OPTICS
Precision-molded proprietary acrylic lenses provide multiple photometric distributions tailored specifically to building mounted applications. Light engines are available in 3000K (80 min. CRI), 4000K (70 min. CRI) or 5000K (65 min. CRI) configurations.

ELECTRICAL
Light engine(s) consist of 10 high-efficacy LEDs mounted to a metal-core circuit board to maximize heat dissipation and promote long life (L87/100,000 hrs at 25°C). Class 1 electronic drivers have a power factor >90%, THD <20%, and a minimum 2.5KV surge rating. When ordering the SPD option, a separate surge protection device is installed within the luminaire which meets a minimum Category C Low (per ANSI/IEEE C62.41.2).

INSTALLATION
Included universal mounting bracket attaches securely to any 4" round or square outlet box for quick and easy installation. Luminaire has a slotted gasket wireway and attaches to the mounting bracket via corrosion-resistant screws.

LISTINGS
CSA certified to U.S. and Canadian standards. Rated for -40°C minimum ambient.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY
Five year limited warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

Note: Specifications subject to change without notice.

Visual - Template Tool

AcuityBrands.

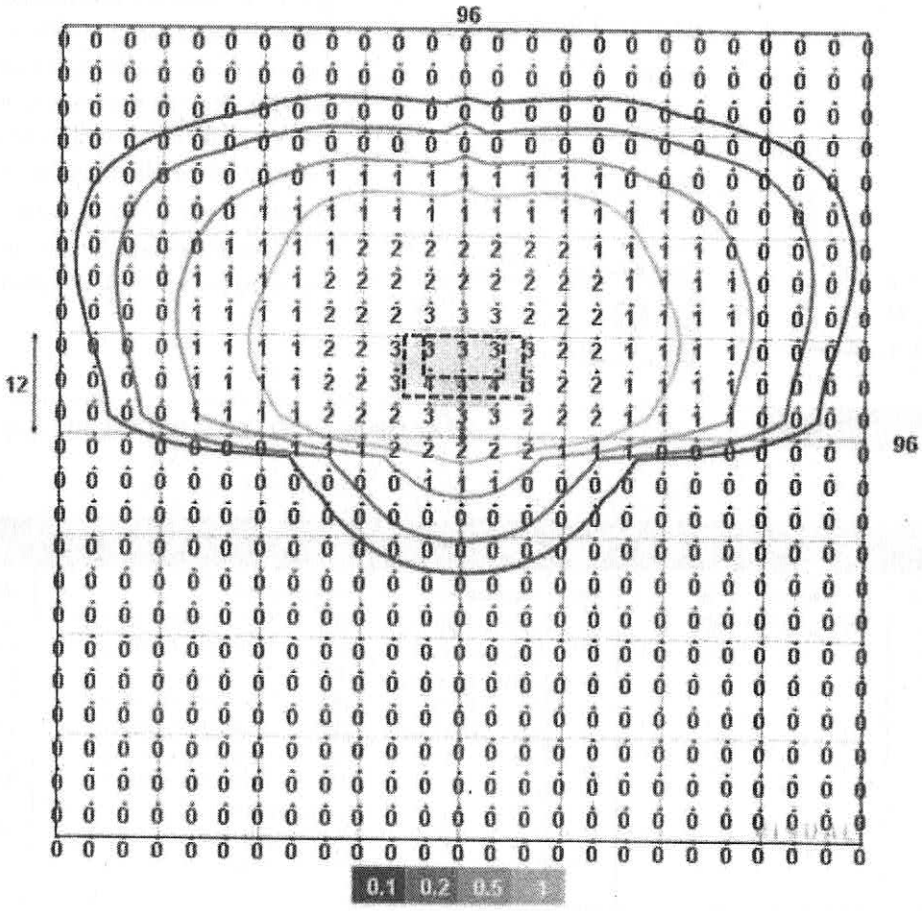
Design Information

Tuesday, January 21, 2014

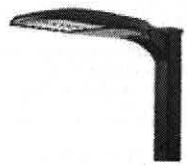
Project
Description

Name
Company
Phone
Email

[DSX1] - DSX1 LED 30C 530 40K T4M



[DSX1] - DSX1 LED 30C 530 40K T4M MVOLT HS



Manufacturer	Lithonia Lighting	Configuration	Single
Lamp Lumens	3872	Orientation	Single
Lamp Quantity	1	Mounting Height	12
Light Loss Factor	1	Arm Length	1
Input Power	52	Tilt	0
Max Illuminance	4	Area > 3fc	127

WSQ LED
Architectural Wall Sconce

Catalog Number

Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements

Inverted available with WLU option only.

Introduction

The classic Architectural Wall Sconce is now available with the latest in LED technology. The result is a long-life, maintenance-free product with typical energy savings of 75% compared to metal halide versions. The integral battery backup option provides emergency egress lighting, without the use of a back-box or remote gear, so installations maintain their aesthetic integrity.

The WSQ LED is ideal for replacing existing 50 – 175W metal halide wall-mounted products. The expected service life is 20+ years of nighttime use.

Specifications

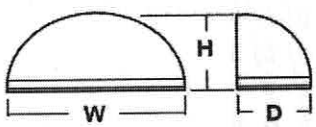
Luminaire

Height: 7-1/4" (18.4 cm)

Width: 16-1/4" (41.3 cm)

Depth: 9-1/8" (23.2 cm)

Weight: 17 lbs (7.7 kg)

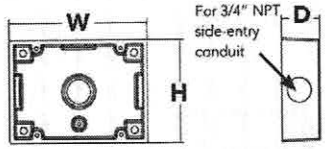


Optional Back Box (BBW)

Height: 4" (10.2 cm)

Width: 5-1/2" (14.0 cm)

Depth: 1-1/2" (3.8 cm)



Ordering Information

EXAMPLE: WSQ LED 2 10A700/40K SR3 MVOLT DDBTXD

WSQ LED							
Series	**Light Engines**	**Performance Package**	**Distribution**	**Voltage**	**Mounting**	**Options**[1]	**Finish** *(required)*
WSQ LED	1 One engine (10 LEDs) 2 Two engines (20 LEDs)	**700 mA options:** 10A700/40K 4000K	SR2 Type II SR3 Type III SR4 Type IV	MVOLT[1] 120[1] 208[1] 240[1] 277[1] 347 480	**Shipped included** (blank) Surface mount **Shipped separately**[2] BBW Surface-mounted back box UT5 Uptilt 5 degrees	**Shipped installed** PE Photoelectric cell, button type[4,5] SF Single fuse (120, 277, 347V)[4] DF Double fuse (208, 240, 480V)[4] DMG 0-10V dimming driver (no controls) ELCW Emergency battery backup[5] WLU Wet location door for up orientation[7] PIR Motion/ambient light sensor[8] **Shipped separately** VG Vandal guard WG Wire guard	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DSSXD Sandstone DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white DSSTXD Textured sandstone

Emergency Battery Operation

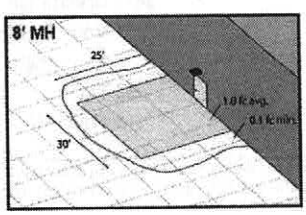
The emergency battery backup (ELCW option) is integral to the luminaire - no external housing required! This design provides reliable emergency operation while maintaining the aesthetics of the product.

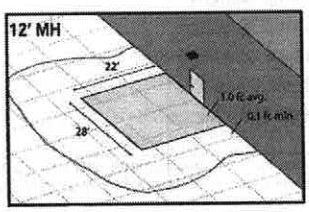
All ELCW configurations include an independent secondary driver with an integral relay to immediately detect AC power loss. Dual light engines are wired in parallel so both engines operate in emergency mode and provide additional component redundancy. These design features meet various interpretations of NFPA 70/NEC 2008 - 700.16

The emergency battery will power the luminaire for a minimum duration of 90 minutes (maximum duration of three hours) from the time supply power is lost, per International Building Code Section 1006 and NFPA 101 Life Safety Code Section 7.9, provided luminaires are mounted at an appropriate height and illuminate an open space with no major obstructions.

The examples at right show illuminance of 1 fc average and 0.1 fc minimum of the single-engine Type IV product in emergency mode.

WST LED 1 10A700/40K SR4 MVOLT ELCW
10' x 10' Gridlines
8' and 12' Mounting Height





NOTES

1. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with photocell (PE option) or fusing (SF, DF options).
2. May also be ordered separately as an accessory. Ex: **WSBBW DDBXD U. Must specify finish.**
3. Must be ordered with fixture; cannot be field installed.
4. Not available with MVOLT option. Button photocell (PE) can be ordered with a dedicated voltage option. Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
5. Not available with 480V option. Not available with motion/ambient light sensor (PIR).
6. Integral battery pack is rated for -20° to 60°C operating temperature. ELCW warranty is 3-year period. Not available with 347V or 480V. Not available with WLU.
7. WLU not available with PIR or ELCW.
8. **Specifies the** SensorSwitch SFD-7-ODP control (photocell included); see Motion Sensor Guide for details. Includes ambient light sensor. Not available with "PE" option (button type photocell). Dimming driver standard. Not available with WLU, VG or WG.

LITHONIA LIGHTING
One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Actual wattage may differ by +/- 8% when operating between 120-480V +/- 10%.

Light Engines	Drive Current (mA)	Performance Package	System Watts (MVOLT[1])	Dist. Type	40K (4000K, 70 CRI)				
					Nominal Lumens	B	U	G	LPW
1 (10 LEDs)	700	10A700/--K	24W	SR2	2,005	1	0	1	84
				SR3	2,029	1	0	1	84
				SR4	1,959	1	0	1	82
2 (20 LEDs)	700	10A700/--K	47W	SR2	3,944	1	0	1	84
				SR3	4,028	1	0	1	86
				SR4	3,851	1	0	1	82

1 See electrical load chart for 347/480V system watts.

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.10
10°C	50°F	1.06
20°C	68°F	1.02
25°C	77°F	1.00
30°C	86°F	0.98
40°C	104°F	0.92

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the **WSQ LED 2 10A700 platform in a 25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	0.94	0.88	0.77

Electrical Load

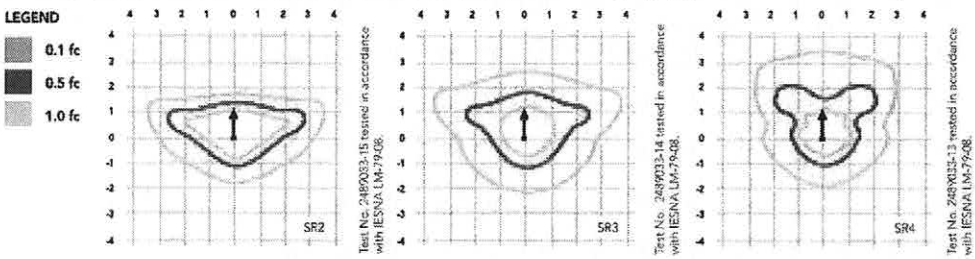
Light Engines	Drive Current (mA)	System Watts	Current (A)					
			120	208	240	277	347	480
1	700	24W	0.24	0.14	0.12	0.1	-	-
		29W[1]	-	-	-	-	0.09	0.07
2	700	47W	0.44	0.27	0.23	0.20	-	-
		53W[1]	-	-	-	-	0.17	0.12

1 Higher wattage is due to electrical losses from step-down transformer.

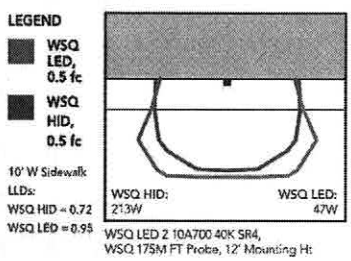
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's WSQ LED homepage.

Isofootcandle plots for the WSQ LED 2 10A700/40K SR2, SR3, and SR4. Distances are in units of mounting height (12').



Distribution overlay comparison to 175W metal halide.



WSQ LED 2 10A700 40K SR4, WSQ 175M PT Probe, 12' Mounting Ht

FEATURES & SPECIFICATIONS

INTENDED USE
The classic architectural shape of the WSQ LED was designed for applications such as hospitals, schools, malls, restaurants, and commercial buildings. The long life LEDs and driver make this luminaire nearly maintenance-free.

CONSTRUCTION
The single-piece die-cast aluminum housing integrates secondary heat sinks to optimize thermal transfer from the internal light engine heat sinks and promote long life. The driver is mounted in direct contact with the casting for a low operating temperature and long life. The die-cast door frame is fully gasketed with a one-piece solid silicone gasket to keep out moisture and dust, providing an IP65 rating for the luminaire.

FINISH
Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum, sandstone and white. Available in textured and non-textured finishes.

OPTICS
Precision-molded acrylic lenses are engineered for superior distribution, uniformity, and spacing in wall-mount applications. Light engines are 4000K (70 CRI). The WSQ LED has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL
Light engine(s) consist of 10 high-efficacy LEDs mounted to a metal core circuit board and integral aluminum heat sinks to maximize heat dissipation and promote long life (100,000 hrs at 25°C, L77). Class 2 electronic driver has a power factor >90%, THD <20%. Easily-serviceable surge protection device meets a minimum Category B (per ANSI/IEEE C62.41.2).

INSTALLATION
A universal mounting plate with integral mounting support arms allows the fixture to hinge down for easy access while making wiring connections. The integral bubble level on the mounting plate provides assistance for level placement on every installation.

LISTINGS
CSA certified to U.S. and Canadian standards. Light engines are IP66 rated; luminaire is IP65 rated and suitable for wet locations when mounted with the lenses down. WLU option offers wet location listing in "up" orientation. Rated for -30°C minimum ambient.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY
Five year limited warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

Note: Specifications subject to change without notice.

LITHONIA LIGHTING
One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com

Rev. 12/09/13

Visual - Template Tool

AcuityBrands.

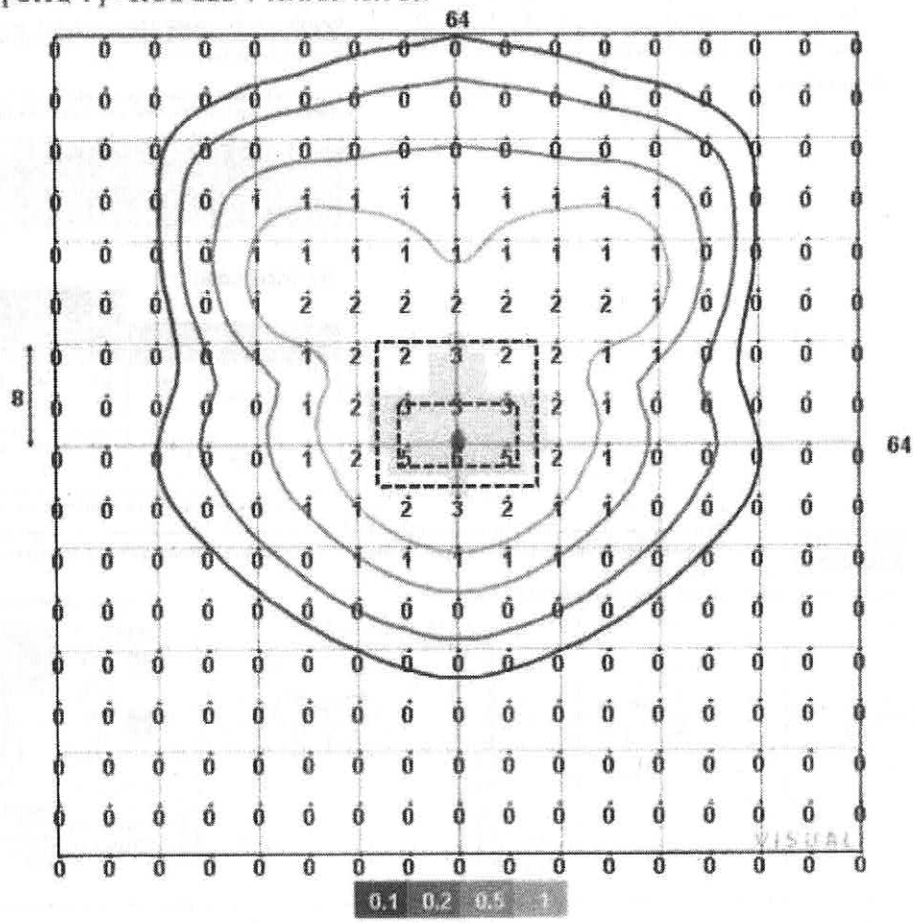
Tuesday, January 21, 2014

Design Information

Project
Description

Name
Company
Phone
Email

[SWQ 1] - WSQ LED 1 10A700/40K SR



[SWQ 1] - WSQ LED 1 10A700/40K SR4 MVOLT

Manufacturer	Lithonia Lighting Configuration		Single
Lamp Lumens	1943 Orientation		Single
Lamp Quantity	1 Mounting Height		8
Light Loss Factor	1 Arm Length		1
Input Power	24.2 Tilt		0
Max Illuminance	7 Area > 3fc		108

CSX2 LED
LED Area Luminaire

Catalog Number

Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements

Specifications

EPA: 1.2 ft² (0.11 m²)

Length: 35-3/8" (89.7 cm)

Width: 18-1/2" (46.9cm)

Height: 5-7/8" (14.9 cm)

Weight (max): 59 lbs (26.8 kg)

Introduction

The Contour® Series luminaires offer traditional square dayforms with softened edges for a versatile look that complements many applications.

The CSX2 combines the latest in LED technology with the familiar aesthetic of the Contour® Series for stylish, high-performance illumination that lasts. It is ideal for replacing traditional metal halide in area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information

EXAMPLE: CSX2 LED 120C 1000 40K T5M MVOLT SPA DDBXD

CSX2 LED **120C**

Series	LEDs	Drive current	Color temperature	Distribution	Voltage	Mounting	Options	Finish (required)
CSX2 LED	120C 120 LEDs	700 700 mA 1000 1000 mA (1 A)	40K 4000K 50K 5000K	T2M Type II T3M Type III T4M Type IV T5M Type V TFTM Forward throw	MVOLT [1] 120 [1] 208 [1] 240 [1] 277 [1] 347 480	**Shipped included** SPA Square pole mounting RPA Round pole mounting **Shipped Separately** [2] SPUMBA Square pole universal mounting adaptor RPUMBA Round pole universal mounting adaptor	**Shipped installed** PER NEMA twist-lock receptacle only (no controls) DCR Dimmable and controllable via ROAM® (no controls) [3] DMG 0-10V dimming driver (no controls) [4] HS House-side shield [2] SF Single fuse (120, 277, 347V) [5] DF Double fuse (208, 240, 480V) [5] DS Dual switching [6,7] WTB Utility terminal block [7] UT Utility terminal block and closing screws [8] BL30 Bi-level switched dimming, 30% [7,9] BL50 Bi-level switched dimming, 50% [7,9] **Shipped separately** [2] VG Vandal guard BS Bird-deterrant spikes	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

Accessories

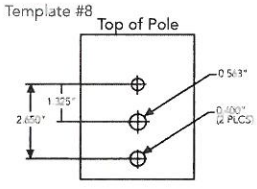
Ordered and shipped separately.

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) [10]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) [10]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) [10]
SC U	Shorting cap [10]
SPUMBA DDBXD U	Square pole universal mounting bracket adaptor (specify finish)
RPUMBA DDBXD U*	Round pole universal mounting bracket adaptor (specify finish)
CSX2HS U	House-side shields (includes 4 shields)
CSX2VG U	Vandal guard accessory
CSX2BS U	Bird-deterrent spikes accessory

For more control options, visit DTL and ROAM.

Drilling

Template #8



CSX2 shares a unique drilling pattern with the AERIS™ family. Specify this drilling pattern when specifying poles.

DM19AS Single unit
DM29AS 2 at 90° *
DM28AS 2 at 180°
DM39AS 3 at 90° *
DM49AS 4 at 90° *
DM32AS 3 at 120° **

Example: SSA 20 4C DM19AS DDBXD

** Round pole requires 3.25" O.D. minimum.*
*** For round pole mounting (RPA) only.*

Tenon Mounting Slipfitter**

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	N/A	N/A	N/A	N/A
2-7/8"	AST25-190	AST25-280	N/A	AST25-320	N/A	N/A
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

NOTES

1. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options).
2. Also available as a separate accessory; see Accessories information at left.
3. Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Not available with 347 or 480V. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net.
4. Not available with 347 or 480V.
5. Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
6. Provides 50% dimming capability via two independent drivers, each operating half the luminaire. N/A with PER, DCR, DMG, WTB or UT.
7. Requires an additional switched line.
8. Not available with BL30 or BL50.
9. Dimming driver standard. MVOLT only. Not available with WTB, UT or DCR.
10. Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item. For 1000mA 347V or 480V PER, must order DLL127F 1.5 JU Photocell - SSL twist-lock (120-277V) as the receptacle is wired after the stepdown transformer.

LITHONIA LIGHTING
One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Actual performance may differ as a result of end-user environment and application. Actual wattage may differ by +/- 8% when operating between 120-480V +/- 10%. Contact factory for performance data on any configurations not shown here.

LEDs	Drive Current (mA)	Performance Package	System Watts	Dist. Type	40K (4000K, 70 CRI)					50K (5000K, 67 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
120C (120 LEDs)	700 mA	120C 700 --K	268W	T2M	26,094	3	0	4	97	28,107	3	0	4	105
				T3M	27,757	3	0	4	104	29,897	3	0	4	112
				T4M	27,658	3	0	4	103	29,792	3	0	5	111
				T5M	28,025	5	0	4	105	30,186	5	0	4	113
				TFTM	28,304	3	0	4	106	30,487	3	0	4	114
	1000 mA	120C 1000 --K	416W	T2M	34,700	4	0	4	83	37,406	4	0	5	90
				T3M	36,910	4	0	5	89	39,789	4	0	5	96
				T4M	36,780	3	0	5	88	39,649	4	0	5	95
				T5M	37,267	5	0	4	90	40,174	5	0	5	97
				TFTM	37,638	3	0	5	90	40,574	3	0	5	98

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	**77°F**	**1.00**
30°C	86°F	1.00
40°C	104°F	0.99

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the **CSX2 LED 120C** platform in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	0.94	0.90	0.83

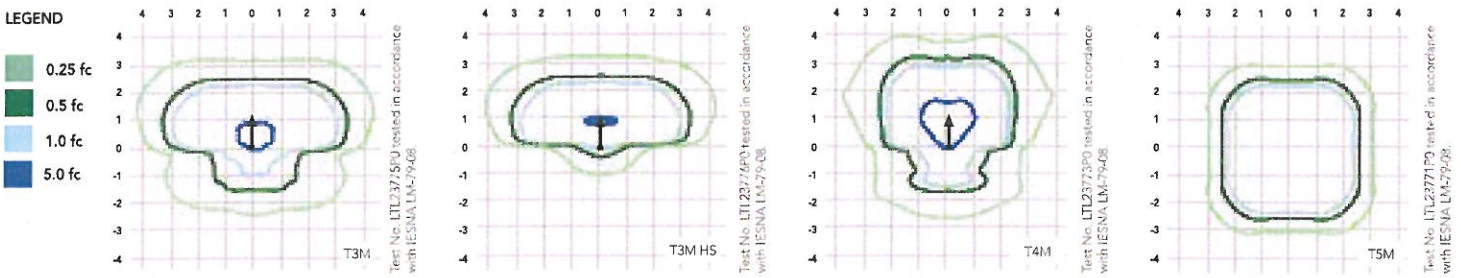
Electrical Load

Number of LEDs	Drive Current (mA)	System Watts	Current (A)					
			120	208	240	277	347	480
120C	700	268W	2.643	1.511	1.318	1.159	0.923	0.674
	1000	416W	4.135	2.397	2.111	1.886	1.527	1.210

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's CSX2 homepage.

Isofootcandle plots for the CSX2 LED 120C 1000 40K. Distances are in units of mounting height (30').



FEATURES & SPECIFICATIONS

INTENDED USE

The Contour Series LED area luminaire is ideal for streets, walkways, parking lots, and surrounding areas that call for high-performance LED lighting in a transitional dayform.

CONSTRUCTION

Single-piece die cast housing has a unique flow-through design that allows for optimized thermal management through convective cooling. A metallic screen covers the top of the housing, preventing debris build-up while allowing natural cleaning of the heat sinks. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver(s) and electronics are thermally isolated from the light engines, ensuring long life. Housing is completely sealed against moisture and environmental contaminants.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling.

OPTICS

Precision-molded acrylic lenses provide optimal luminaire spacing and improved uniformity. Lenses are indexed to the circuit board to ensure consistent optical alignment and delivering repeatable photometric performance. Light engines are available in standard 4000K (70 CRI) or optional 5000K (67 CRI) configurations. The CSX2 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL

Light engines consist of 120 high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (100,000 hrs at 40°C, L70). Class 1 electronic driver designed to have a power factor >90%, THD <20%, with an expected life of 100,000 hours with <1% failure rate. Easily-serviceable surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

INSTALLATION

Integral arm provides easy installation to a pole and assists in alignment and leveling. Secure connection withstands up to 2.0 G vibration load rating per ANSI C136.31. The CSX2 utilizes the AERIS™ series pole drilling pattern for SPA and RPA options.

LISTINGS

CSA Certified to U.S. and Canadian standards. Light engines are IP66 rated. Luminaire is IP65 rated. **U.S. Patent No. D632830. U.S. Patent No. D653,382 S.**

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY

Five year limited warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

Note: Specifications subject to change without notice.

Visual - Template Tool

AcuityBrands.

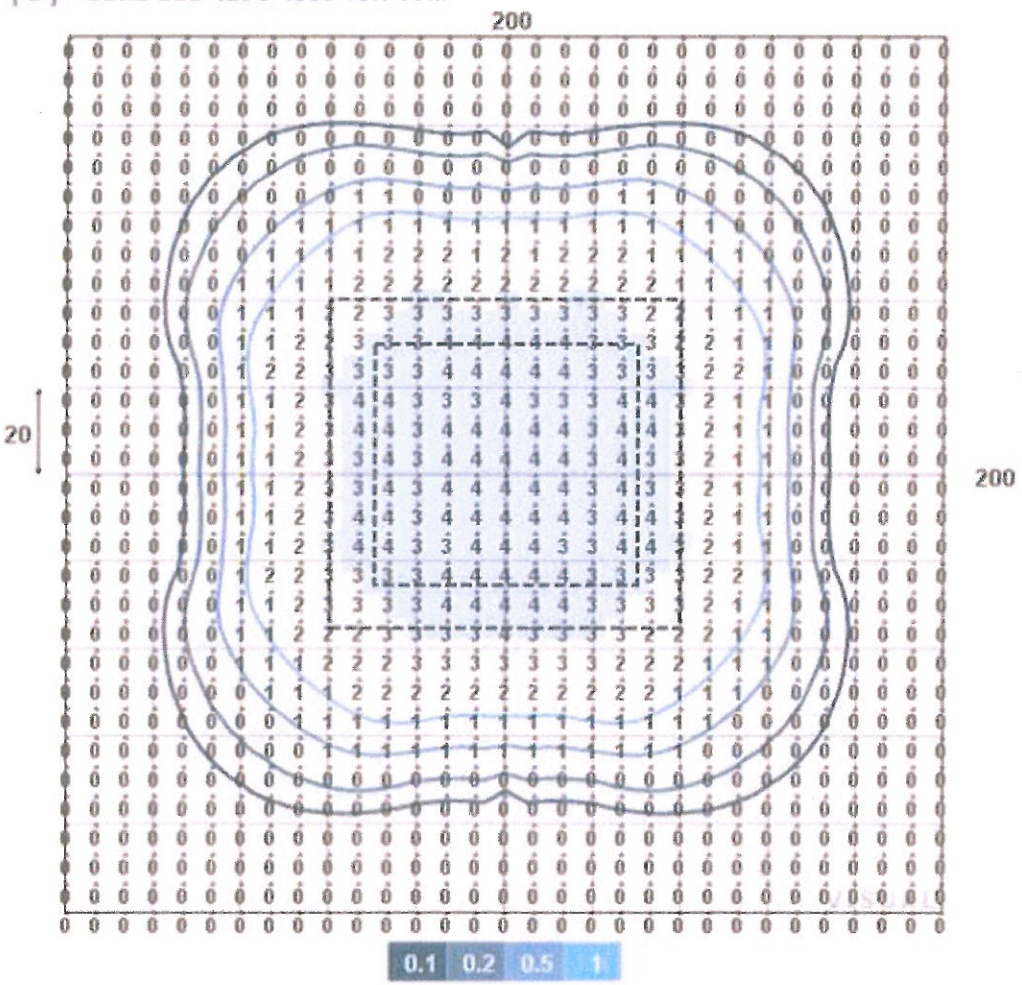
Tuesday, January 21, 2014

Design Information

Project
Description

Name
Company
Phone
Email

[E] - CSX2 LED 120C 1000 40K T5M



[E] - CSX2 LED 120C 1000 40K T5M MVOLT

Manufacturer	Lithonia Lighting Configuration		Single
Lamp Lumens	37267	Orientation	Single
Lamp Quantity	1	Mounting Height	20
Light Loss Factor	1	Arm Length	1
Input Power	416	Tilt	0
Max Illuminance	4	Area > 3fc	5400

Visual - Template Tool

AcuityBrands.

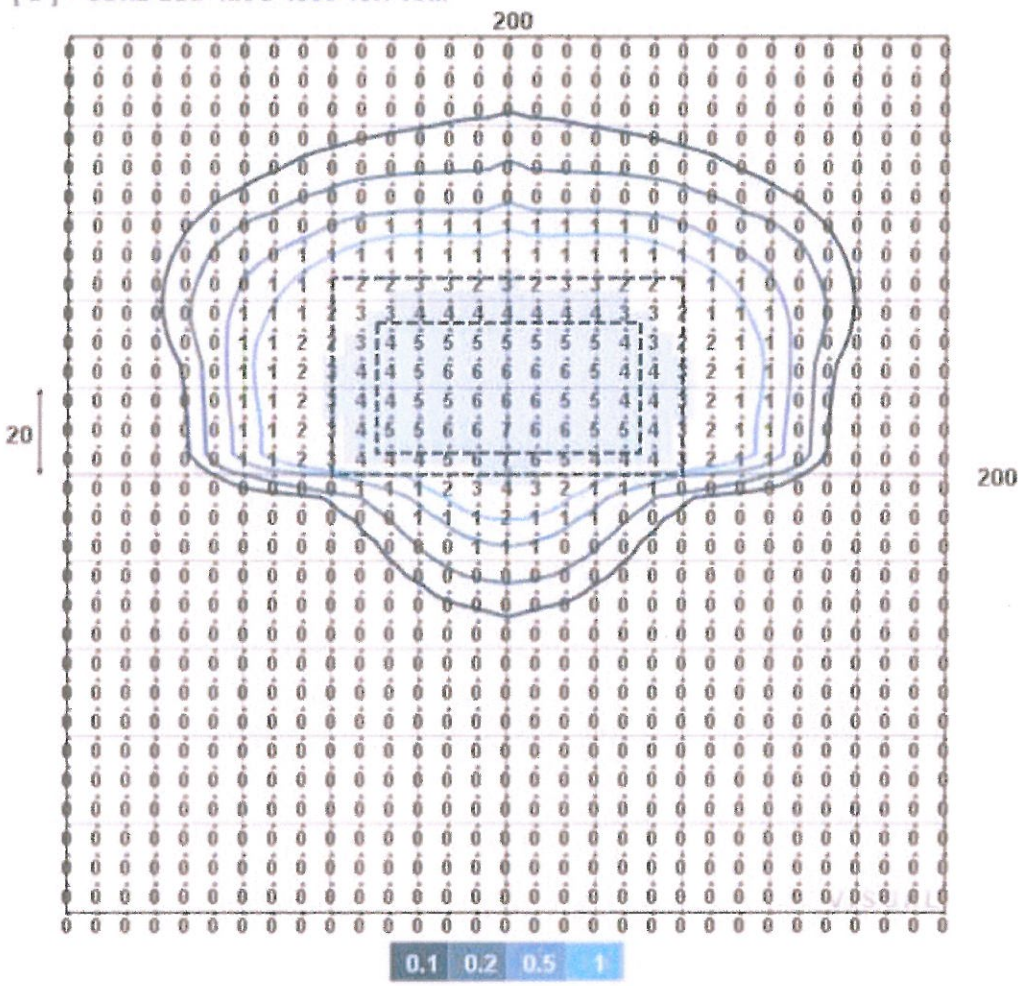
Tuesday, January 21, 2014

Design Information

Project
Description

Name
Company
Phone
Email

[E] - CSX2 LED 120C 1000 40K T5M



[E] - CSX2 LED 120C 1000 40K T5M MVOLT HS

Manufacturer	Lithonia Lighting	Configuration	Single
Lamp Lumens	23604	Orientation	Single
Lamp Quantity	1	Mounting Height	20
Light Loss Factor	1	Arm Length	1
Input Power	416	Tilt	0
Max Illuminance	7	Area > 3fc	3100

D-Series Size 1
LED Area Luminaire

Catalog Number

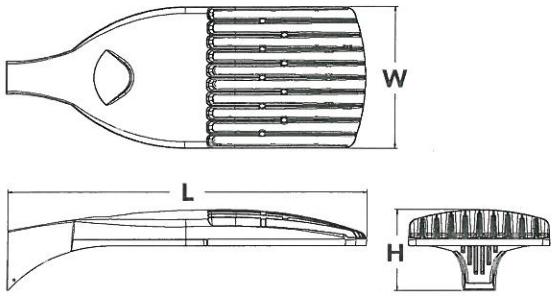
Notes

Type

Hit the tab key or mouse over the page to see all interactive elements

Specifications

EPA:	1.2 ft² (0.11 m²)
Length:	33" (83.8 cm)
Width:	13" (33.0 cm)
Height:	7-1/2" (19.0 cm)
Weight (max):	27 lbs (12.2 kg)



Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.

The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing 100 – 400W metal halide in pedestrian and area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

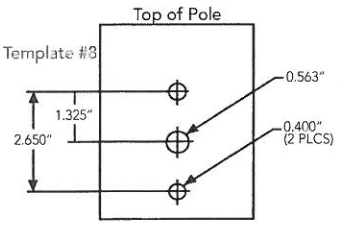
Ordering Information

EXAMPLE: DSX1 LED 60C 1000 40K T3M MVOLT SPA DDBXD

DSX1 LED

Series	LEDs	Drive current	Color temperature	Distribution	Voltage	Mounting	Control options	Other options	Finish (required)
DSX1 LED	**Forward optics** 30C 30 LEDs (one engine) 40C 40 LEDs (two engines) 60C 60 LEDs (two engines) **Rotated optics** 60C 60 LEDs (two engines)	530 530 mA 700 700 mA 1000 1000 mA (1 A)	30K 3000K (80 CRI min.) 40K 4000K (70 CRI min.)[1] 50K 5000K (67 CRI)	T1S Type I short T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium T5VS Type V very short T5S Type V short T5M Type V medium T5W Type V wide	MVOLT[2] 120[2] 208[2] 240[2] 277[2] 347[3] 480[3]	**Shipped included** SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMBA Square pole universal mounting adaptor[4] RPUMBA Round pole universal mounting adaptor[4]	**Shipped installed** PER NEMA twist-lock receptacle only (no controls)[5] DMG 0-10V dimming driver (no controls)[6] DCR Dimmable and controllable via ROAM® (no controls)[7] DS Dual switching[8,9] PIR Motion sensor, 8-15' mounting height[10] PIRH Motion sensor, 15-30' mounting height[10] BL30 Bi-level switched dimming, 30%[6,8,11] BL50 Bi-level switched dimming, 50%[6,8,11]	**Shipped installed** HS House-side shield[12] WTB Utility terminal block[13] SF Single fuse (120, 277, 347V)[14] DF Double fuse (208, 240, 480V)[14] TLS Tool-less entry trigger latch[15] L90 Left rotated optics[16] R90 Right rotated optics[16]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

Drilling



DSX1 shares a unique drilling pattern with the AERIS™ family. Specify this drilling pattern when specifying poles, per the table below.

DM19AS	Single unit	**DM29AS**	2 at 90°*
DM28AS	2 at 180°	**DM39AS**	3 at 90°*
DM49AS	4 at 90°*	**DM32AS**	3 at 120° **

Example: SSA 20 4C DM19AS DDBXD

Visit Lithonia Lighting's POLES CENTRAL to see our wide selection of poles, accessories and educational tools.

**Round pole top must be 3.25" O.D. minimum.*
***For round pole mounting (RPA) only.*

Accessories

Ordered and shipped separately.

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V)[17]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V)[17]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V)[17]
SC U	Shorting cap[17]
DSX1HS 30C U	House-side shield for 30 LED unit
DSX1HS 40C U	House-side shield for 40 LED unit
DSX1HS 60C U	House-side shield for 60 LED unit
PUMBA DDBXD U*	Square and round pole universal mounting bracket adaptor (specify finish)

For more control options, visit DTL and ROAM online.

Tenon Mounting Slipfitter **

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	N/A	N/A	N/A	N/A
2-7/8"	AST25-190	AST25-280	N/A	AST25-320	N/A	N/A
4"	AST35-160	AST35-290	AST35-290	AST35-320	AST35-390	AST35-490

NOTES

1. Configured with 4000K (40K) provides the shortest lead times. Consult factory for 3000K (30K) and 5000K (50K) lead times.
2. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options).
3. Not available with single board, 530mA product (30C 530). N/A with 1000 mA. Not available with DMG, DCR, BL30, BL50, WTB, or TLS.
4. Available as a separate combination accessory: PUMBA (finish) U.
5. Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Not available with DS option.
6. Not available with 347 or 480V.
7. Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Not available with 347 or 480V. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net. N/A with BL30, BL50, DS, TLS, PIR or PIRH.
8. Requires 40C or 60C. Provides 50/50 luminaire operation via two independent drivers on two separate circuits. N/A with PER, DCR, WTB, PIR, or PIRH.
9. Requires an additional switched circuit.
10. PIR specifies the SensorSwitch SBR-10-ODP control; PIRH specifies the SensorSwitch SBR-6-ODP control; see Motion Sensor Guide for details.Dimming driver standard. Not available with DCR.
11. Dimming driver standard. MVOLT only. Not available with DCR or WTB.
12. Also available as a separate accessory; see Accessories information.
13. WTB not available with BL30, BL50, DS, PIR or PIRH. N/A 347v or 480v.
14. Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
15. With TLS option, the luminaire is no longer IP65 rated. Not available with BL30, BL50, DCR, PIR or PIRH. N/A 347v or 480v.
16. Available with 60 LEDs (60C option) only.
17. Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item from Acuity Brands Control.

LITHONIA LIGHTING

One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Actual performance may differ as a result of end-user environment and application. Actual wattage may differ by +/- 8% when operating between 120-480V +/-10%. Contact factory for performance data on any configurations not shown here.

LEDs	Drive Current (mA)	Performance Package	System Watts	Dist. Type	30K (3000K, 80 minimum CRI)					40K (4000K, 70 minimum CRI)					50K (5000K, 67 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
30C (30 LEDs)	700 mA	30C 700 --K	68 W	T1S	5,290	1	0	1	78	6,524	2	0	2	96	7,053	2	0	2	104
				T2S	5,540	1	0	1	81	6,833	2	0	2	100	7,387	2	0	2	109
				T2M	5,360	1	0	2	79	6,611	2	0	2	97	7,147	2	0	2	105
				T3S	5,479	1	0	1	81	6,757	1	0	2	99	7,305	2	0	2	107
				T3M	5,452	1	0	2	80	6,724	2	0	2	99	7,269	2	0	2	107
				T4M	5,461	1	0	2	80	6,736	2	0	2	99	7,282	2	0	2	107
				TFTM	5,378	1	0	2	79	6,633	1	0	2	98	7,171	1	0	2	105
				T5VS	5,708	2	0	0	84	7,040	3	0	0	104	7,611	3	0	1	112
				T5S	5,639	2	0	0	83	6,955	2	0	0	102	7,519	3	0	0	111
				T5M	5,710	3	0	1	84	7,042	3	0	1	104	7,613	3	0	2	112
				T5W	5,551	3	0	1	82	6,847	3	0	2	101	7,401	3	0	2	109
	1000 mA	30C 1000 --K	105 W	T1S	7,229	2	0	2	69	9,168	2	0	2	87	9,874	2	0	2	94
				T2S	7,572	2	0	2	72	9,603	2	0	2	91	10,342	2	0	2	98
				T2M	7,325	2	0	2	70	9,291	2	0	2	88	10,005	2	0	3	95
				T3S	7,488	2	0	2	71	9,496	2	0	2	90	10,227	2	0	2	97
				T3M	7,451	2	0	2	71	9,450	2	0	2	90	10,177	2	0	2	97
				T4M	7,464	2	0	2	71	9,467	2	0	2	90	10,195	2	0	2	97
				TFTM	7,351	1	0	2	70	9,323	2	0	2	89	10,040	2	0	3	96
				T5VS	7,801	3	0	1	74	9,894	3	0	1	94	10,655	3	0	1	101
				T5S	7,803	3	0	2	74	9,774	3	0	1	93	10,526	3	0	1	100
				T5M	7,707	3	0	0	73	9,897	3	0	2	94	10,658	4	0	2	102
				T5W	7,586	3	0	2	72	9,621	4	0	2	92	10,363	4	0	2	99
40C (40 LEDs)	700 mA	40C 700 --K	89 W	T1S	6,876	2	0	2	77	8,639	2	0	2	97	9,345	2	0	2	105
				T2S	7,202	2	0	2	81	9,049	2	0	2	102	9,788	2	0	2	110
				T2M	6,968	2	0	2	78	8,755	2	0	2	98	9,469	2	0	3	106
				T3S	7,122	2	0	2	80	8,948	2	0	2	101	9,679	2	0	2	109
				T3M	7,088	2	0	2	80	8,905	2	0	2	100	9,632	2	0	2	108
				T4M	7,100	2	0	2	80	8,920	2	0	2	100	9,649	2	0	2	108
				TFTM	6,992	1	0	2	79	8,785	2	0	2	99	9,502	2	0	2	107
				T5VS	7,421	3	0	0	83	9,323	3	0	1	105	10,085	3	0	1	113
				T5S	7,331	2	0	0	82	9,210	3	0	1	103	9,962	3	0	1	112
				T5M	7,423	3	0	2	83	9,326	3	0	2	105	10,087	4	0	2	113
				T5W	7,216	3	0	2	81	9,066	4	0	2	102	9,807	4	0	2	110
	1000 mA	40C 1000 --K	138 W	T1S	9,521	2	0	2	69	11,970	2	0	2	87	12,871	3	3	0	93
				T2S	9,972	2	0	2	72	12,558	3	0	3	91	13,481	3	0	3	98
				T2M	9,648	2	0	3	70	12,149	3	0	3	88	13,043	3	0	3	95
				T3S	9,862	2	0	2	71	12,418	2	0	2	90	13,331	2	0	2	97
				T3M	9,814	2	0	2	71	12,358	3	0	3	90	13,267	3	0	3	96
				T4M	9,831	2	0	2	71	12,379	2	0	3	90	13,290	2	0	3	96
				TFTM	9,681	2	0	2	70	12,191	2	0	3	88	13,087	2	0	3	95
				T5VS	10,275	3	0	1	74	12,937	3	0	1	94	13,890	4	0	1	101
				T5S	10,150	3	0	1	74	12,782	3	0	1	93	13,721	3	0	1	99
				T5M	10,278	4	0	2	74	12,942	4	0	2	94	13,894	4	0	2	101
				T5W	9,991	4	0	2	72	12,582	4	0	2	91	13,507	4	0	2	98
60C (60 LEDs)	700 mA	60C 700 --K	131 W	T1S	10,226	2	0	2	78	12,871	3	0	3	98	13,929	3	0	3	106
				T2S	10,711	2	0	2	82	13,481	3	0	3	103	14,589	3	0	3	111
				T2M	10,363	2	0	3	79	13,043	3	0	3	100	14,115	3	0	3	108
				T3S	10,592	2	0	2	81	13,331	2	0	2	102	14,427	3	0	3	110
				T3M	10,541	2	0	2	80	13,267	3	0	3	101	14,357	3	0	3	110
				T4M	10,559	2	0	2	81	13,290	2	0	3	101	14,382	3	0	3	110
				TFTM	10,398	2	0	3	79	13,087	2	0	3	100	14,163	2	0	3	108
				T5VS	11,036	3	0	1	84	13,890	4	0	4	106	15,032	4	0	1	115
				T5S	10,902	3	0	1	83	13,721	3	0	1	105	14,849	4	0	1	113
				T5M	11,039	4	0	2	84	13,894	4	0	2	106	15,036	4	0	2	115
				T5W	10,732	4	0	2	82	13,507	4	0	2	103	14,617	4	0	2	112
	1000 mA	60C 1000 --K	209 W	T1S	14,017	3	0	3	67	17,632	3	0	3	84	19,007	3	0	3	91
				T2S	14,681	3	0	3	70	18,467	3	0	3	88	19,908	3	0	3	95
				T2M	14,204	3	0	3	68	17,867	3	0	3	85	19,260	3	0	3	92
				T3S	14,518	3	0	3	69	18,262	3	0	3	87	19,687	3	0	3	94
				T3M	14,448	3	0	3	69	18,173	3	0	4	87	19,591	3	0	4	94
				T4M	14,473	3	0	3	69	18,205	3	0	3	87	19,625	3	0	4	94
				TFTM	14,253	2	0	3	68	17,928	3	0	4	86	19,326	3	0	4	92
				T5VS	15,127	4	0	1	72	19,028	4	0	1	91	20,512	4	0	1	98
				T5S	14,943	4	0	1	71	18,797	4	0	1	90	20,263	4	0	1	97
				T5M	15,131	4	0	2	72	19,033	4	0	2	91	20,517	5	0	3	98
				T5W	14,710	4	0	2	70	18,503	5	0	3	89	19,946	5	0	3	95

Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	**77°F**	**1.00**
30°C	86°F	1.00
40°C	104°F	0.99

Electrical Load

Number of LEDs	Drive Current (mA)	System Watts	Current (A) 120	208	240	277	347	480
30	530	52	0.52	0.30	0.26	0.23	—	—
	700	68	0.68	0.39	0.34	0.30	0.24	0.17
	1000	105	1.03	0.59	0.51	0.45	—	—
40	530	68	0.67	0.39	0.34	0.29	0.23	0.17
	700	89	0.89	0.51	0.44	0.38	0.31	0.22
	1000	138	1.35	0.78	0.67	0.58	—	—
60	530	99	0.97	0.56	0.48	0.42	0.34	0.24
	700	131	1.29	0.74	0.65	0.56	0.45	0.32
	1000	209	1.98	1.14	0.99	0.86	—	—

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

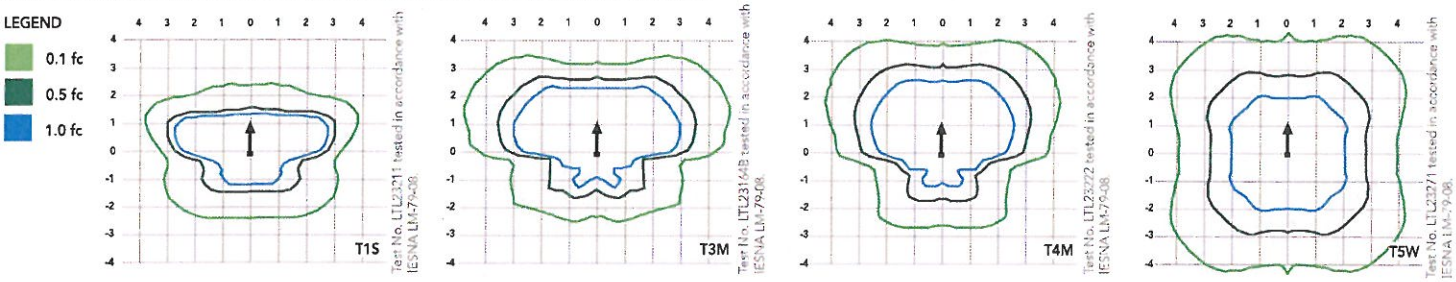
To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	DSX1 LED 60C 1000			
	1.0	0.95	0.93	0.88
	DSX1 LED 60C 700			
	1.0	0.99	0.98	0.96

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Area Size 1 homepage.

Isofootcandle plots for the DSX1 LED 60C 1000 40K. Distances are in units of mounting height (20').



FEATURES & SPECIFICATIONS

INTENDED USE
The sleek design of the D-Series Size 1 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and streetscapes.

CONSTRUCTION
Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (1.2 ft²) for optimized pole wind loading.

FINISH
Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

OPTICS
Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in standard 4000K (70 minimum CRI) or optional 3000K (80 minimum CRI) or 5000K (67 CRI) configurations. The D-Series Size 1 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL
Light engine configurations consist of 30, 40 or 60 high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L96/100,000 hours at 25°C). Class 1 electronic drivers are designed to have a power factor >90%, THD <20%, and an expected life of 100,000 hours with <1% failure rate. Easily serviceable 10kV or 6kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

INSTALLATION
Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 1 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 1 utilizes the AERIS™ series pole drilling pattern. Optional terminal block, tool-less entry, and NEMA photocontrol receptacle are also available.

LISTINGS
CSA certified to U.S. and Canadian standards. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY
Five-year limited warranty. Full warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Specifications subject to change without notice.

Visual - Template Tool

AcuityBrands.

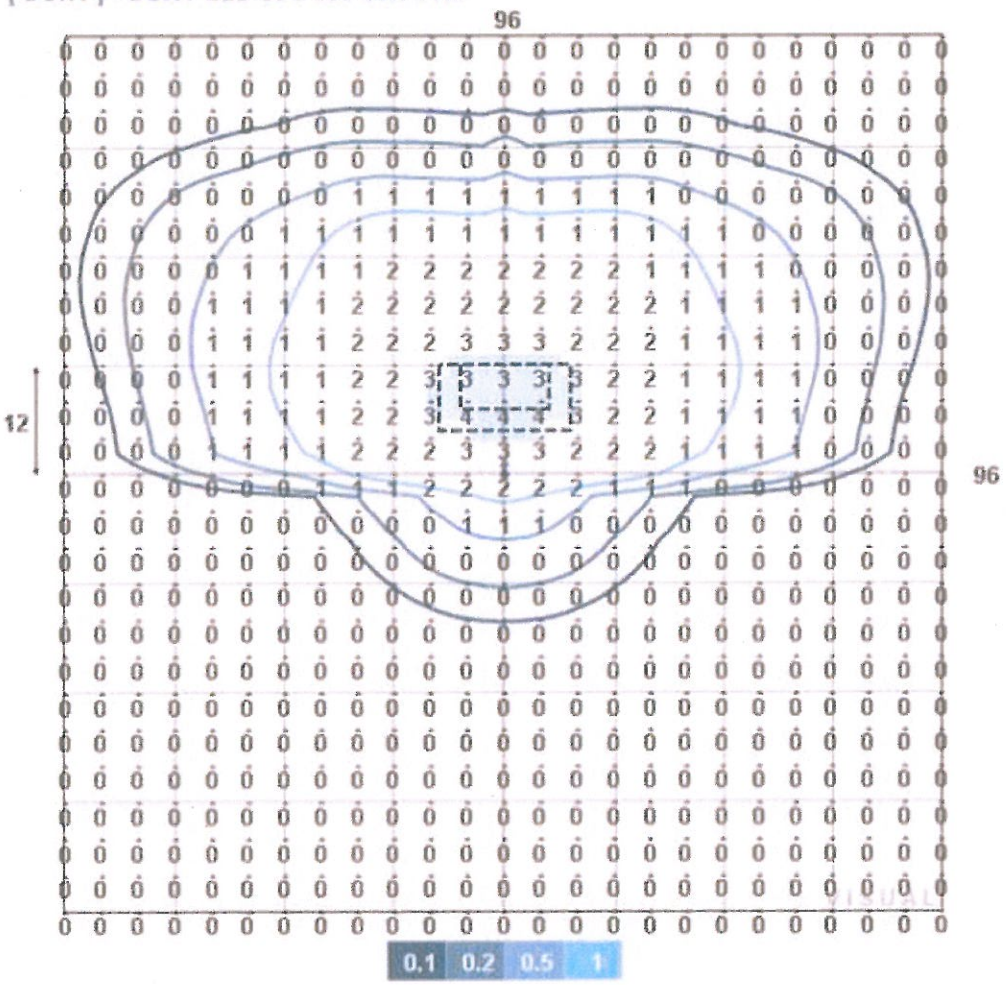
Tuesday, January 21, 2014

Design Information

Project
Description

Name
Company
Phone
Email

[DSX1] - DSX1 LED 30C 530 40K T4M



[DSX1] - DSX1 LED 30C 530 40K T4M MVOLT HS

Manufacturer		Lithonia Lighting Configuration	Single
Lamp Lumens	3872	Orientation	Single
Lamp Quantity	1	Mounting Height	12
Light Loss Factor	1	Arm Length	1
Input Power	52	Tilt	0
Max Illuminance	4	Area > 3fc	127

D-Series Size 2
LED Wall Luminaire

Catalog Number

Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements

d-series

Introduction

The D-Series Wall luminaire is a stylish, fully integrated LED solution for building-mount applications. It features a sleek, modern design and is carefully engineered to provide long-lasting, energy-efficient lighting with a variety of optical and control options for customized performance.

With an expected service life of over 20 years of nighttime use and up to 76% in energy savings over comparable 400W metal halide luminaires, the D-Series Wall is a reliable, low-maintenance lighting solution that produces sites that are exceptionally illuminated.

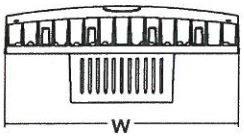
Specifications

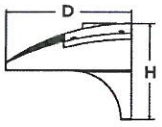
Luminaire

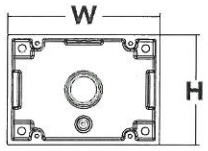
Width:	18-1/2" (47.0 cm)	**Weight:**	21 lbs (9.5 kg)
Depth:	10" (25.4 cm)		
Height:	7-5/8" (19.4 cm)		

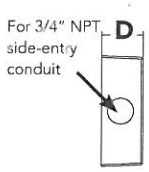
Back Box (BBW)

Width:	5-1/2" (14.0 cm)	**BBW Weight:**	1 lbs (0.5 kg)
Depth:	1-1/2" (3.8 cm)		
Height:	4" (10.2 cm)		









Ordering Information

EXAMPLE: DSXW2 LED 30C 700 40K T3M MVOLT DDBTXD

DSXW2 LED

Series	LEDs	Drive Current	Color temperature	Distribution	Voltage	Mounting	Control Options	Other Options	Finish *(required)*
DSXW2 LED	20C 20 LEDs (two engines) 30C 30 LEDs (three engines)	350 350 mA 530 530 mA 700 700 mA 1000 1000 mA (1 A)	30K 3000K 40K 4000K 50K 5000K	T2S Type II Short T2M Type II Medium T3S Type III Short T3M Type III Medium T4M Type IV Medium TFTM Forward Throw Medium	MVOLT[1] 120[1] 208[1] 240[1] 277[1] 347[2] 480[2]	**Shipped included** (blank) Surface mounting bracket **Shipped separately[3]** BBW Surface-mounted back box (for conduit entry)	**Shipped installed** PE Photoelectric cell, button type[4] PER NEMA twist-lock receptacle only (no controls) DMG 0-10V dimming driver (no controls) DCR Dimmable and control-labie via ROAM® (no controls)[5] PIRH 180° motion/ ambient light sensor, 15-30' mtg ht[6]	**Shipped installed** SF Single fuse (120, 277, 347V)[7] DF Double fuse (208, 240, 480V)[7] HS House-side shield[3] SPD Separate surge protection[9] **Shipped separately** BSW Bird-deterrent spikes[3] WG Wire guard[3] VG Vandal guard[3]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DSSXD Sandstone DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white DSSTXD Textured sandstone

NOTES

1. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options), or photocontrol (PE option).
2. Available with 30 LED/700mA options only (DSXW2 LED 30C 700).
3. Also available as a separate accessory; see Accessories information.
4. Photocontrol (PE) requires 120, 208, 240 or 277 voltage option. Not available with motion/ambient light sensors (PIR or PIRH).
5. Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Not available with 347 or 480V. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net.
6. Specifies the Sensor Switch SBR-6-ODP control; see Motion Sensor Guide for details. Includes ambient light sensor. Not available with "PE" option (button type photocell). Dimming driver standard.
7. Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
8. Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item.
9. See the electrical section on page 2 for more details.

Accessories

Ordered and shipped separately

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V)[8]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V)[8]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V)[8]
SC U	Shorting cap[4]
DSXWHS U	House-side shield (one per light engine)
DSXWBSW U	Bird-deterrent spikes
DSXW2WG U	Wire guard accessory
DSXW2VG U	Vandal guard accessory
DSXW2BBW DDBXD U	Back box accessory **(specify finish)**

LITHONIA LIGHTING

One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Actual performance may differ as a result of end-user environment and application. Actual wattage may differ by +/- 8% when operating between 120-480V +/- 10%. Contact factory for performance data on any configurations not shown here.

LEDs	Drive Current (mA)	Performance Package	System Watts	Dist. Type	40K (4000K, 70 CRI)					50K (5000K, 65 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
20C (20 LEDs)	530	20C 530 --K	36 W	T2S	3,533	1	0	1	98	3,860	1	0	1	107
				T2M	3,437	1	0	1	95	3,755	1	0	1	104
				T3S	3,489	1	0	1	97	3,811	1	0	1	106
				T3M	3,545	1	0	2	98	3,873	1	0	2	108
				T4M	3,498	1	0	1	97	3,822	1	0	1	106
				TFTM	3,495	1	0	1	97	3,819	1	0	1	106
	700	20C 700 --K	47 W	T2S	4,371	1	0	1	93	4,776	1	0	1	102
				T2M	4,252	1	0	1	90	4,647	1	0	2	99
				T3S	4,316	1	0	1	92	4,716	1	0	1	100
				T3M	4,386	1	0	2	93	4,793	1	0	2	102
				T4M	4,328	1	0	1	92	4,729	1	0	2	101
				TFTM	4,324	1	0	1	92	4,725	1	0	2	101
	1000	20C 1000 --K	73 W	T2S	5,914	1	0	1	81	6,462	1	0	1	89
				T2M	5,754	1	0	2	79	6,287	2	0	2	86
				T3S	5,839	1	0	1	80	6,380	1	0	2	87
				T3M	5,935	1	0	2	81	6,484	1	0	2	89
				T4M	5,855	1	0	2	80	6,398	1	0	2	88
				TFTM	5,851	1	0	2	80	6,393	1	0	2	88
30C (30 LEDs)	530	30C 530 --K	54 W	T2S	5,280	1	0	1	98	5,769	1	0	1	107
				T2M	5,137	1	0	2	95	5,613	1	0	2	104
				T3S	5,214	1	0	1	97	5,696	1	0	1	105
				T3M	5,298	1	0	2	98	5,789	1	0	2	107
				T4M	5,228	1	0	2	97	5,712	1	0	2	106
				TFTM	5,223	1	0	2	97	5,707	1	0	2	106
	700	30C 700 --K	71 W	T2S	6,513	1	0	1	92	7,118	2	0	2	100
				T2M	6,337	2	0	2	89	6,925	2	0	2	98
				T3S	6,431	1	0	2	91	7,028	1	0	2	99
				T3M	6,536	1	0	2	92	7,143	2	0	3	101
				T4M	6,449	1	0	2	91	7,047	1	0	2	99
				TFTM	6,444	1	0	2	91	7,042	1	0	2	99
	1000	30C 1000 --K	109 W	T2S	8,697	2	0	2	80	9,501	2	0	2	87
				T2M	8,462	2	0	2	78	9,244	2	0	2	85
				T3S	8,588	1	0	2	79	9,381	2	0	2	86
				T3M	8,728	2	0	3	80	9,534	2	0	3	87
				T4M	8,611	1	0	2	79	9,407	2	0	2	86
				TFTM	8,604	2	0	2	79	9,399	2	0	2	86

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	**77°F**	**1.00**
30°C	86°F	1.00
40°C	104°F	0.98

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the **DSXW2 LED 30C 1000** platform in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	0.95	0.92	0.87

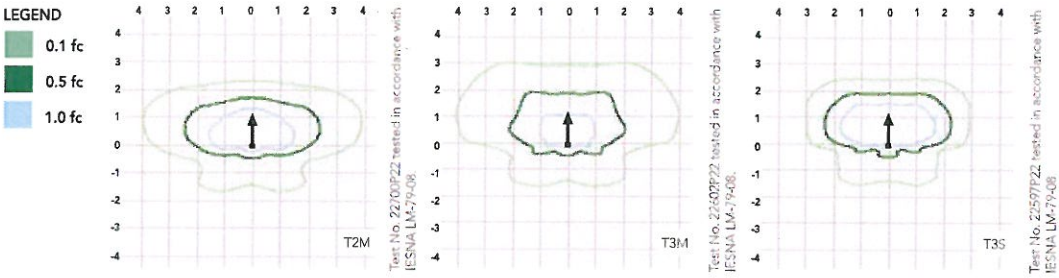
Electrical Load

LEDs	Drive Current (mA)	System Watts	Current (A)					
			120	208	240	277	347	480
20C	350	25 W	0.23	0.13	0.12	0.10	-	-
	530	36 W	0.33	0.19	0.17	0.14	-	-
	700	47 W	0.44	0.25	0.22	0.19	-	-
	1000	73 W	0.68	0.39	0.34	0.29	-	-
30C	350	36 W	0.33	0.19	0.17	0.14	-	-
	530	54 W	0.50	0.29	0.25	0.22	-	-
	700	71 W	0.66	0.38	0.33	0.28	0.23	0.16
	1000	109 W	1.01	0.58	0.50	0.44	-	-

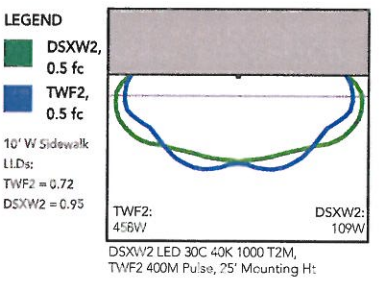
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Wall Size 2 homepage.

Isofootcandle plots for the DSXW2 LED 30C 1000 40K. Distances are in units of mounting height (25').



Distribution overlay comparison to 400W metal halide.



DSXW2 LED 30C 40K 1000 T2M, TWF2 400M Pulse, 25' Mounting Ht

FEATURES & SPECIFICATIONS

INTENDED USE

The energy savings, long life and easy-to-install design of the D-Series Wall Size 2 make it the smart choice for building-mounted doorway and pathway illumination for nearly any facility.

CONSTRUCTION

Two-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance. The LED driver is mounted to the door to thermally isolate it from the light engines for low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65).

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in textured and non-textured finishes.

OPTICS

Precision-molded proprietary acrylic lenses provide multiple photometric distributions tailored specifically to building mounted applications. Light engines are available in 3000K (80 min. CRI), 4000K (70 min. CRI) or 5000K (65 min. CRI) configurations.

ELECTRICAL

Light engine(s) consist of 10 high-efficacy LEDs mounted to a metal-core circuit board to maximize heat dissipation and promote long life (L87/100,000 hrs at 25°C). Class 1 electronic drivers have a power factor >90%, THD <20%, and a minimum 2.5KV surge rating. When ordering the SPD option, a separate surge protection device is installed within the luminaire which meets a minimum Category C Low (per ANSI/IEEE C62.41.2).

INSTALLATION

Included universal mounting bracket attaches securely to any 4" round or square outlet box for quick and easy installation. Luminaire has a slotted gasket wireway and attaches to the mounting bracket via corrosion-resistant screws.

LISTINGS

CSA certified to U.S. and Canadian standards. Rated for -40°C minimum ambient.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY

Five year limited warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

Note: Specifications subject to change without notice.

Visual - Template Tool

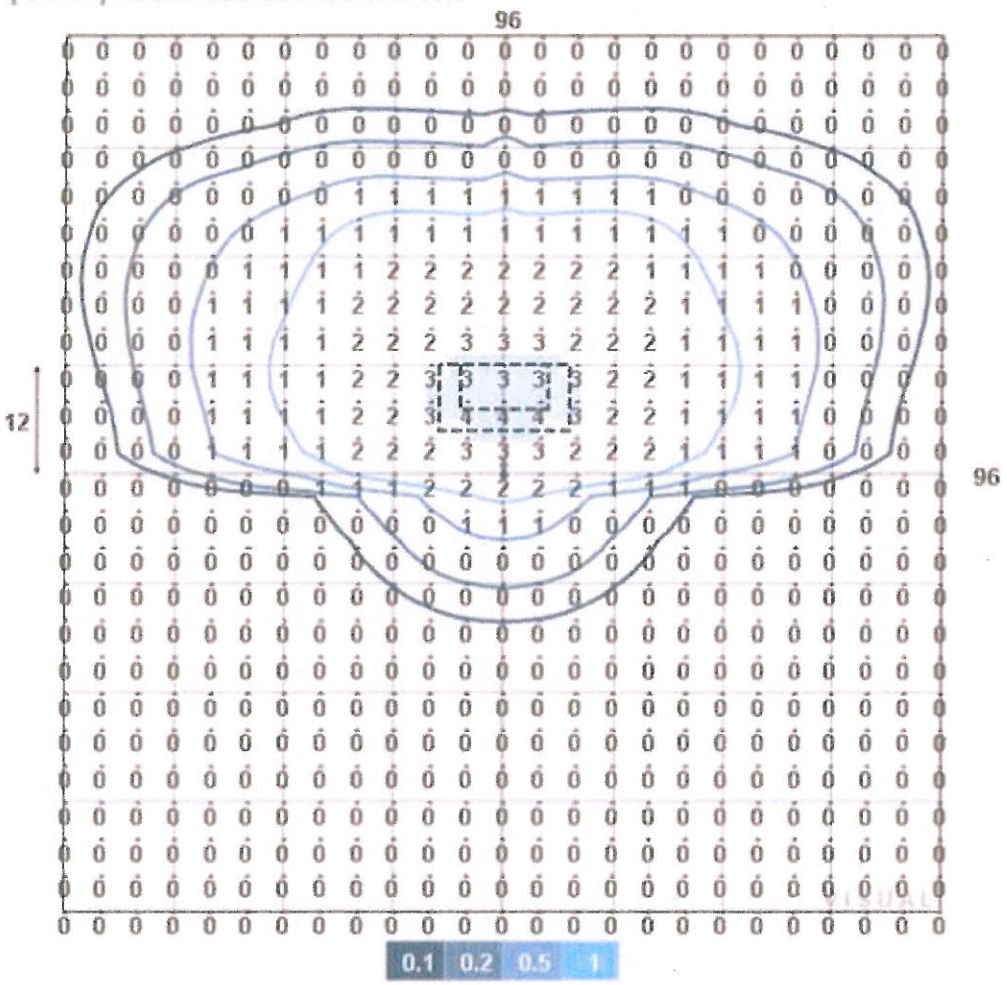
Tuesday, January 21, 2014

Design Information

Project
Description

Name
Company
Phone
Email

[DSX1] - DSX1 LED 30C 530 40K T4M



[DSX1] - DSX1 LED 30C 530 40K T4M MVOLT HS

Manufacturer	Lithonia Lighting	Configuration	Single
Lamp Lumens	3872	Orientation	Single
Lamp Quantity	1	Mounting Height	12
Light Loss Factor	1	Arm Length	1
Input Power	52	Tilt	0
Max Illuminance	4	Area > 3fc	127

Inverted available with WLU option only.

WSQ LED
Architectural Wall Sconce

Catalog Number

Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements

Introduction

The classic Architectural Wall Sconce is now available with the latest in LED technology. The result is a long-life, maintenance-free product with typical energy savings of 75% compared to metal halide versions. The integral battery backup option provides emergency egress lighting, without the use of a back-box or remote gear, so installations maintain their aesthetic integrity.

The WSQ LED is ideal for replacing existing 50 – 175W metal halide wall-mounted products. The expected service life is 20+ years of nighttime use.

Specifications

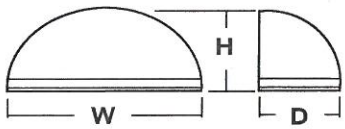
Luminaire

Height: 7-1/4" (18.4 cm)

Width: 16-1/4" (41.3 cm)

Depth: 9-1/8" (23.2 cm)

Weight: 17 lbs (7.7 kg)

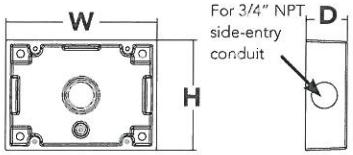


Optional Back Box (BBW)

Height: 4" (10.2 cm)

Width: 5-1/2" (14.0 cm)

Depth: 1-1/2" (3.8 cm)



Ordering Information

EXAMPLE: WSQ LED 2 10A700/40K SR3 MVOLT DDBTXD

WSQ LED

Series	Light Engines	Performance Package	Distribution	Voltage	Mounting	Options[3]	Finish *(required)*
WSQ LED	1 One engine (10 LEDs) 2 Two engines (20 LEDs)	**700 mA options:** 10A700/40K 4000K	SR2 Type II SR3 Type III SR4 Type IV	MVOLT[1] 120[1] 208[1] 240[1] 277[1] 347 480	**Shipped included** (blank) Surface mount **Shipped separately**[2] BBW Surface-mounted back box UT5 Uplift 5 degrees	**Shipped installed** PE Photoelectric cell, button type[4,5] SF Single fuse (120, 277, 347V)[4] DF Double fuse (208, 240, 480V)[4] DMG 0-10V dimming driver (no controls) ELCW Emergency battery backup[6] WLU Wet location door for up orientation[7] PIR Motion/ambient light sensor[8] **Shipped separately** VG Vandal guard WG Wire guard	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DSSXD Sandstone DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white DSSTXD Textured sandstone

Emergency Battery Operation

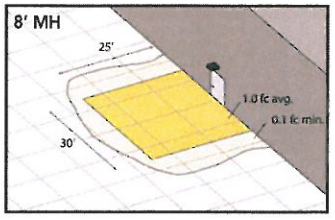
The emergency battery backup (ELCW option) is integral to the luminaire - no external housing required! This design provides reliable emergency operation while maintaining the aesthetics of the product.

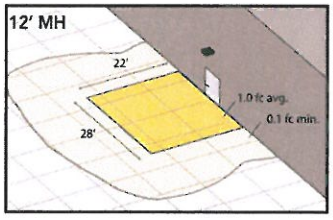
All ELCW configurations include an independent secondary driver with an integral relay to immediately detect AC power loss. Dual light engines are wired in parallel so both engines operate in emergency mode and provide additional component redundancy. These design features meet various interpretations of NFPA 70/NEC 2008 - 700.16

The emergency battery will power the luminaire for a minimum duration of 90 minutes (maximum duration of three hours) from the time supply power is lost, per International Building Code Section 1006 and NFPA 101 Life Safety Code Section 7.9, provided luminaires are mounted at an appropriate height and illuminate an open space with no major obstructions.

The examples at right show illuminance of 1 fc average and 0.1 fc minimum of the single-engine Type IV product in emergency mode.

WST LED 1 10A700/40K SR4 MVOLT ELCW
10' x 10' Gridlines
8' and 12' Mounting Height





NOTES

1. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with photocell (PE option) or fusing (SF, DF options).
2. May also be ordered separately as an accessory. Ex: WSBBW DDBXD U. Must specify finish.
3. Must be ordered with fixture; cannot be field installed.
4. Not available with MVOLT option. Button photocell (PE) can be ordered with a dedicated voltage option. Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
5. Not available with 480V option. Not available with motion/ambient light sensor (PIR).
6. Integral battery pack is rated for -20° to 60°C operating temperature. ELCW warranty is 3-year period. Not available with 347V or 480V. Not available with WLU.
7. WLU not available with PIR or ELCW.
8. Specifies the SensorSwitch SFD-7-ODP control (photocell included); see Motion Sensor Guide for details. Includes ambient light sensor. Not available with "PE" option (button type photocell). Dimming driver standard. Not available with WLU, VG or WG.

LITHONIA LIGHTING
One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Actual wattage may differ by +/- 8% when operating between 120-480V +/- 10%.

Light Engines	Drive Current (mA)	Performance Package	System Watts (MVOLT[1])	Dist. Type	40K (4000K, 70 CRI)				
					Nominal Lumens	B	U	G	LPW
1 (10 LEDs)	700	10A700/--K	24W	SR2	2,005	1	0	1	84
				SR3	2,029	1	0	1	84
				SR4	1,959	1	0	1	82
2 (20 LEDs)	700	10A700/--K	47W	SR2	3,944	1	0	1	84
				SR3	4,028	1	0	1	86
				SR4	3,851	1	0	1	82

1 See electrical load chart for 347/480V system watts.

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.10
10°C	50°F	1.06
20°C	68°F	1.02
25°C	**77°F**	**1.00**
30°C	86°F	0.98
40°C	104°F	0.92

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the **WSQ LED 2 10A700** platform in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	0.94	0.88	0.77

Electrical Load

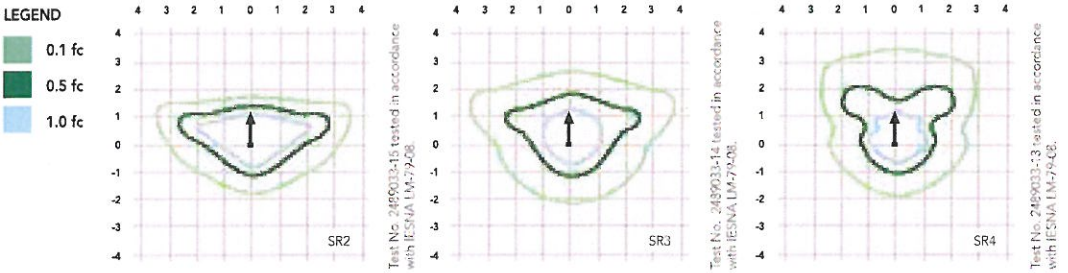
Light Engines	Drive Current (mA)	System Watts	Current (A)					
			120	208	240	277	347	480
1	700	24W	0.24	0.14	0.12	0.1	-	-
		29W[1]	-	-	-	-	0.09	0.07
2	700	47W	0.44	0.27	0.23	0.20	-	-
		53W[1]	-	-	-	-	0.17	0.12

1 Higher wattage is due to electrical losses from step-down transformer.

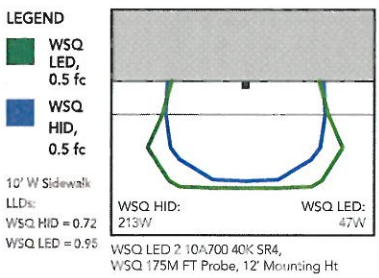
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's WSQ LED homepage.

Isofootcandle plots for the WSQ LED 2 10A700/40K SR2, SR3, and SR4. Distances are in units of mounting height (12').



Distribution overlay comparison to 175W metal halide.



WSQ LED 2 10A700 40K SR4, WSQ 175M FT Probe, 12' Mounting Ht

FEATURES & SPECIFICATIONS

INTENDED USE

The classic architectural shape of the WSQ LED was designed for applications such as hospitals, schools, malls, restaurants, and commercial buildings. The long life LEDs and driver make this luminaire nearly maintenance-free.

CONSTRUCTION

The single-piece die-cast aluminum housing integrates secondary heat sinks to optimize thermal transfer from the internal light engine heat sinks and promote long life. The driver is mounted in direct contact with the casting for a low operating temperature and long life. The die-cast door frame is fully gasketed with a one-piece solid silicone gasket to keep out moisture and dust, providing an IP65 rating for the luminaire.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum, sandstone and white. Available in textured and non-textured finishes.

OPTICS

Precision-molded acrylic lenses are engineered for superior distribution, uniformity, and spacing in wall-mount applications. Light engines are 4000K (70 CRI). The WSQ LED has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL

Light engine(s) consist of 10 high-efficacy LEDs mounted to a metal core circuit board and integral aluminum heat sinks to maximize heat dissipation and promote long life (100,000 hrs at 25°C, L77). Class 2 electronic driver has a power factor >90%, THD <20%. Easily-serviceable surge protection device meets a minimum Category B (per ANSI/IEEE C62.41.2).

INSTALLATION

A universal mounting plate with integral mounting support arms allows the fixture to hinge down for easy access while making wiring connections. The integral bubble level on the mounting plate provides assistance for level placement on every installation.

LISTINGS

CSA certified to U.S. and Canadian standards. Light engines are IP66 rated; luminaire is IP65 rated and suitable for wet locations when mounted with the lenses down. WLU option offers wet location listing in "up" orientation. Rated for -30°C minimum ambient.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY

Five year limited warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

Note: Specifications subject to change without notice.

LITHONIA LIGHTING

One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com

Rev. 12/09/13

Visual - Template Tool

AcuityBrands.

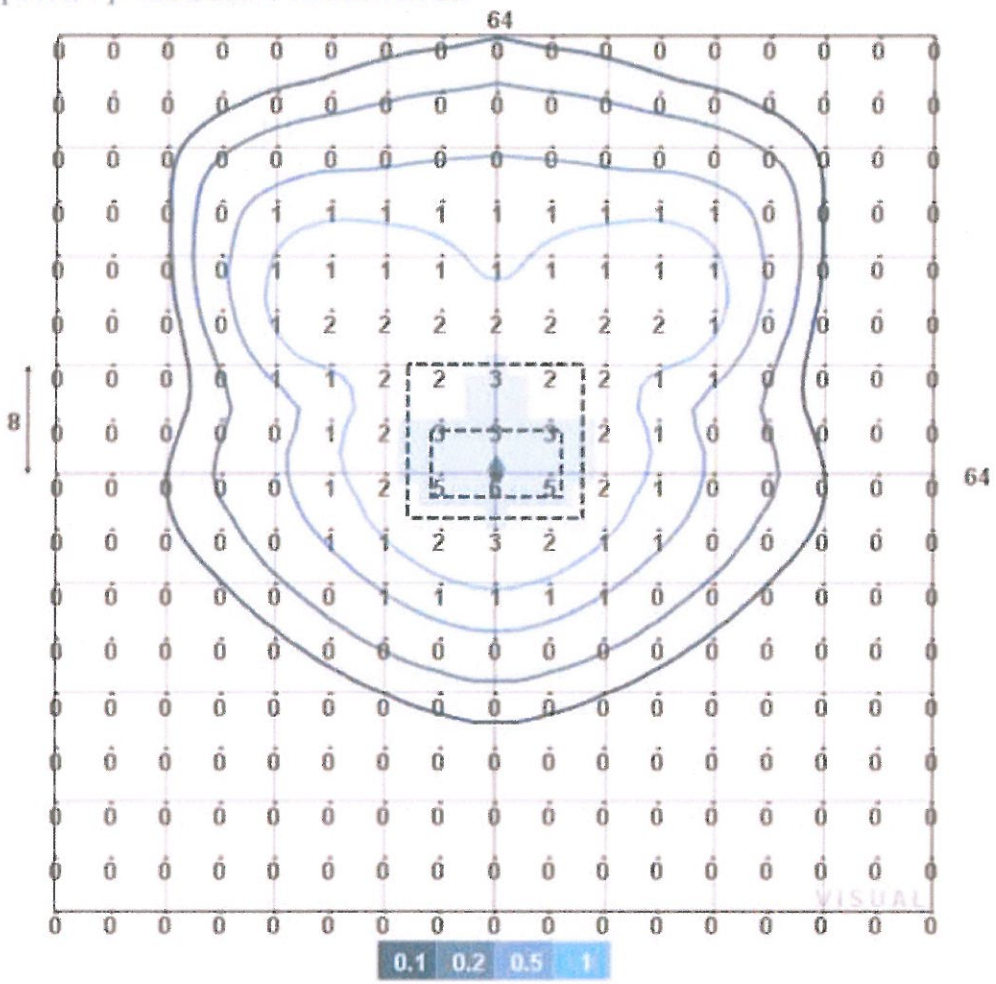
Tuesday, January 21, 2014

Design Information

Project
Description

Name
Company
Phone
Email

[SWQ 1] - WSQ LED 1 10A700/40K SR



[SWQ 1] - WSQ LED 1 10A700/40K SR4 MVOLT

Manufacturer	Lithonia Lighting	Configuration	Single
Lamp Lumens	1943	Orientation	Single
Lamp Quantity	1	Mounting Height	8
Light Loss Factor	1	Arm Length	1
Input Power	24.2	Tilt	0
Max Illuminance	7	Area > 3fc	108

1. Foothills (SW7514)
   7" Reveal Fiber-Cement
   Lap Siding

2. Dry Dock (SW7502)
   5" Reveal Fiber-Cement
   Lap Siding

3. Barcelona Beige (SW7530)
   Wood and Composite Trim
   Fiber-Cement Smooth Board
   Column Wrap

4. Black Fox (SW7020)
   Fiber-Cement Board & Batten

5. Charcoal Grey
   Composite Roof Shingles

Milbrandt Architects
25 Central Way, Ste 210
Kirkland, Washington 98033
P: 425.454.7130 F: 425.858.1208
Web: www.milbrandtarch.com

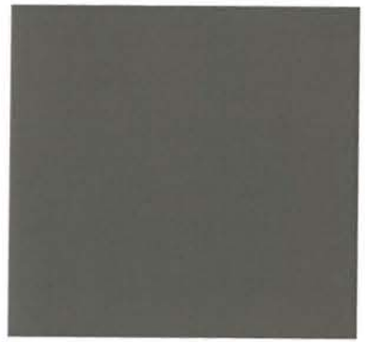
COLOR SCHEME 1

OREGON CITY LIVE/WORK - APARTMENTS

1. Foothills (SW7514)
   7" Reveal Fiber-Cement
   Lap Siding

2. Dry Dock (SW7502)
   5" Reveal Fiber-Cement
   Lap Siding

3. Barcelona Beige (SW7530)
   Wood and Composite Trim
   Fiber-Cement Smooth Board
   Column Wrap



4. Black Fox (SW7020)
   Fiber-Cement Board & Batten

5. Charcoal Grey
   Composite Roof Shingles

Milbrandt Architects
25 Central Way, Ste 210
Kirkland, Washington 98033
P: 425.454.7130 F: 425.656.1208
Web: www.milbrandtarch.com

COLOR SCHEME 1

OREGON CITY LIVE/WORK - TOWNHOMES

1. Messanger Bag (SW7740)
   7" Reveal Fiber-Cement
   Lap Siding

2. Herbal Wash (SW7739)
   5" Reveal Fiber-Cement
   Lap Siding

3. Sage Green Light (SW2851)
   Wood and Composite Trim
   Fiber-Cement Smooth Board
   Column Wrap

4. Muddled Basil (SW7745)
   Fiber-Cement Board & Batten

5. Charcoal Grey
   Composite Roof Shingles

Milbrandt Architects
25 Central Way, Ste 210
Kirkland, Washington 98033
P. 425.454.7730 F. 425.658.1708
Web: www.milbrandtarch.com

COLOR SCHEME 2

OREGON CITY LIVE/WORK - APARTMENTS

1. Messanger Bag (SW7740)
   7" Reveal Fiber-Cement
   Lap Siding

2. Herbal Wash (SW7739)
   5" Reveal Fiber-Cement
   Lap Siding

3. Sage Green Light (SW2851)
   Wood and Composite Trim
   Fiber-Cement Smooth Board
   Column Wrap

4. Muddled Basil (SW7745)
   Fiber-Cement Board & Batten

5. Charcoal Grey
   Composite Roof Shingles

Milbrandt Architects
25 Central Way, Ste 210
Kirkland, Washington 98033
P: 425.454.7130 F: 425.453.7388
Web: www.milbrandtarch.com

COLOR SCHEME 2

OREGON CITY LIVE/WORK - TOWNHOMES

1. Colonial Revival Stone (SW2827)
   7" Reveal Fiber-Cement
   Lap Siding

2. Stone Lion (SW7507)
   5" Reveal Fiber-Cement
   Lap Siding

3. Brevity Brown (SW6068)
   Wood and Composite Trim
   Fiber-Cement Smooth Board
   Column Wrap

4. Arresting Auburn (SW6034)
   Fiber-Cement Board & Batten

5. Charcoal Grey
   Composite Roof Shingles

Milbrandt Architects
25 Central Way, Ste 210
Kirkland, Washington 98033
P: 425.454.7130 F: 425.658.1706
Web: www.milbrandtarchs.com

COLOR SCHEME 3

OREGON CITY LIVE/WORK - APARTMENTS

1. Colonial Revival Stone (SW2827)
   7" Reveal Fiber-Cement
   Lap Siding

2. Stone Lion (SW7507)
   5" Reveal Fiber-Cement
   Lap Siding

3. Brevity Brown (SW6068)
   Wood and Composite Trim
   Fiber-Cement Smooth Board
   Column Wrap

4. Arresting Auburn (SW6034)
   Fiber-Cement Board & Batten

5. Charcoal Grey
   Composite Roof Shingles

Milbrandt Architects
25 Central Way, Ste 210
Kirkland, Washington 98033
P: 425.454.7130 F: 425.658.1208
Web: www.milbrandtarch.com

COLOR SCHEME 3

OREGON CITY LIVE/WORK - TOWNHOMES

EVERGREEN HOUSING
DEVELOPMENT GROUP

June 11, 2014

Pete Walter, AICP
Oregon City
Community Development – Planning
221 Molalla Ave, Suite 200
Oregon City, OR 97045

RE: Submittal of Items to Address the Notice of Incompleteness for project SP 14-01

Dear Mr. Walter,

Enclosed are revised submittal items and a narrative of revisions and responses based on the comments in the Notice of Incompleteness dated February 20, 2014 for our project at 19896 Beavercreek Road.

This package encompasses all the items listed as missing from the February 20, 2014 notice.

Please continue your completeness review and let me know if there are other items necessary for a complete application.

Sincerely,

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC

Andrew Brand
Beavercreek Road LLC
600 University St, Suite 1708
Seattle, WA 98101

June 10, 2014

Pete Walter
Oregon City – Planning Department
221 Molalla Ave, Suite 200
Oregon City, OR 97045

Project SP 14-01: Site Plan and Design Review
Applicant Response to Notice of Incompleteness Dated February 20, 2014

GENERAL RESPONSE COMMENTS AND NOTES:

In the notice of incompleteness sent on February 20th, 2014 Public Works comments related to preliminary stormwater design and the angle of the intersection at Beavercreek Road and the proposed new Meyers extension necessitated a change in the site plans. The main difference is that building T8 is now removed and a stormwater detention pond is in its place. The total number of units went down from 183 to 180 units. Also, the intersection at Meyer's Way and Beavercreek Road is now an 80 degree angle.

RESPONSE TO PLANNING COMMENTS

17.62.040 A – Site Plans – Plans Required

Items 1, 2, 5, 7, 8, 9, 10, 15 and 16.
Newly submitted civil sheets now show all information requested

17.62.040 B – Landscape Plans

A plan showing the location of all existing trees is provided. Since all trees are to be removed during construction existing trees are not shown on the landscape site plan. The Landscape plans do now show the count of trees and both the base level of trees needed plus the extra "mitigation" trees planted to account for the removal of trees currently on the site. The Arborists report submitted with the application calculated the quantity of mitigation trees required.

Plans also now show the percentage of landscaped area; the Percentage of Interior, Perimeter and Parking Lot Landscaping exceeding minimum code requirements.

17.62.040 C – Architectural Drawings

Elevations of buildings are now accurately reflected to grade and all elevations are represented, not just representative elevations.

Bicycle Parking is shown and calculated on Architectural Plans

Refuse and Recycling plans and designs are more detailed on Architectural Plans.

RESPONSE TO PUBLIC WORK COMMENTS

1. 12.04.180

Street Sections are now included with the plans. The Deviation requested is described in the original application Narrative and relates to adding bicycle lanes where none are currently shown in City Code. The result of our requested deviations actually creates better transportation alternatives by creating bicycle lanes where none are requested per the table in section 12.04.180

2. 12.04.180

Emergency vehicles turning and maneuvering details are now shown on the civil plans in the private parking lot areas we are calling alleys for notation purposes only. These are not public alleys.

3. 12.04.215

The plans now have greater detail on the Beavercreek Improvements. Our improvements would include building out from the edge of the current road improvements along our property line to create a section of roadway with a single Travel Lane, a bicycle lane, a parking lane and a sidewalk. Between the parking lane and the sidewalk there may or may not be a storm water swale depending on the interactions and approval of the City and the County, as Beavercreek Road is currently a County roadway.

4. 12.04.255

Applicant believes that public works intended to reference Code Section 12.04.245 when asking for a description of the curbs. A response to the curbing, as requested, is below.

To promote a safe and efficient pedestrian circulation path throughout the site all street intersections and pedestrian crossings were designed to provide as short a crosswalk distance as possible. This was done by eliminating street parking as you approach the intersection and in turn extending the planter strip and sidewalk into the street pavement area to the back of the drive aisle. These curb extensions increase the visibility of the pedestrians and encourage motorists to drive slower

through the subject area by providing a stronger visual cue of a pedestrian crossing ahead. While the curb extensions are provided primarily for the benefit of the pedestrians, the traffic calming that is encouraged by the curb extensions will also result in a safer intersection for motorists.

5. 12.04.260

The site plan has an extensive network of sidewalks and bicycle lanes to promote walking and bicycling as alternative forms of transit. The Meyers Road extension and the Beavercreek Road improvements all include public sidewalk and public bicycle lane improvements. Streets A and B provide public sidewalks. No TriMet stops are within one mile of the project according to TriMets maps and route system plans. The nearest Transit Street is located to the north of the subject site at the Community College. To access these stations residents of the proposed project can utilize the bicycle lanes in the proposed project site and the lanes along Beavercreek Road.

6. 13.12.050B

REVISED APPLICANT RESPONSE: The proposed project is subject to applicable City stormwater quantity control requirements. Please refer to the revised stormwater report that is included with this Notice of Incompleteness Response for additional information.

7. 17.62.050 A4

The referenced Geotechnical report is included as part of this response.

8. 17.62.050 A4

Any walls that are supporting a public street will be built to City Engineering Standards.

9. 17.62.050 A14

The sanitary sewer design has been studied in an analysis from PACE Engineering dated August 12, 2013, which is now included with this Response. The applicant did not initially include this analysis as the applicant believed the City of Oregon City was performing its own sewer analysis with an element that would have included the study required per Public Work's Note #13 on the official City Pre-Application Meeting Notes dated July 9, 2013. This connection to the Glenn Oak basin was also contemplated in the Project parcel's Re-zone documents in 2010 and the Annexation documents in 2008.

10. 17.62.050 A14

The Applicant and Public Works have participated in conversations with Clackamas River Water District (CRW) about an agreement between CRW and Oregon City for water service to this project. This is a viable option. The City Annexation documents in 2008 stated that adequate water services would be available to the Project site. Since the City cannot provide adequate water services on its own system the proposed system that utilizes excess capacity of the CRW system is a viable alternative, which the Applicant believes the City should pursue in good faith to provide necessary services as contemplated in the Annexation and Rezone documents.

11. Stormwater Report

The stormwater report has been updated to address items a through h.

12. 13. 14.

The storm report and plan for detention have been modified to address Public Works' comments #12, 13 and 14.

15.

The proposed "alleys" shown on the plan are not public alleys. They are private parking areas labeled with the term alley for internal notation purposes. The updated stormwater plan splits the public detention systems from the private systems as described in the updated plans and stormwater report.

16.

The Applicant will design the termination of Meyers Road to the north such that the point of termination will be supported through a wall, or with the permission of the neighboring property owner an easement could be obtained allowing grading on the neighboring property to be adjusted to support the street termination until at such time the street is further extended to the north. The applicant requests that the exact method utilized be a condition of the building permit issuance.

17.

The Applicant will connect to the existing lines in Beavercreek Road (either CRW or Oregon City lines, depending on the final IGA negotiated with CRW and Oregon City). These lines are on the north side of Beavercreek Road. Any connections to those lines by parcels on the south side of Beavercreek Road would need to be made by those developments as part of their development proposals. Any requirements to upgrade water systems beyond that required by Code for the Applicant's project will be compensated through SDC credits or other methods to compensate for the cost of the Applicant's work not required by code for the Project.

18.

The water line at the end of the southern alley parking area is now shown as looped between buildings T1 and T2 back to the main line in Beavercreek Road.

19.

Any requirements to size water mains larger than what is required by Code for the Applicant's Project will be compensated to the Project through SDC credits or other methods of compensation to offset costs incurred by the Applicant.

20.

The Applicant is pursuing the option of connecting to the existing sanitary sewer line in Carrington Place. If that easement is not wide enough to accommodate the sewer pipe then the Applicant will pursue connecting to the pipe on Meyers Road.

21.

The Applicant has corrected this "typo". Sanitary sewer lines are available to all buildings shown on the site plan.

22.

The Applicant will extend sanitary sewer lines to the end of Street B to facilitate future development. Street A and Street B both connect to the same parcel so only one extension is necessary. Given the topography of the site and the neighboring parcels the developer finds it highly unlikely for developments that would extend Street B to actually utilize this sanitary sewer connection. SDC credits or other forms of compensation will be provided to the Applicant for this work to offset the costs that are beyond the developer's Code required responsibility.

23.

The Applicant has legitimate engineering concerns about how projects on the South side of Beavercreek Road would connect to a sewer line that is designed to drain to the South side of Beavercreek Road. The applicant is not required to provide sanitary sewer services for future developments. Any requirements to have the applicant provide sewer lines above the code requirements and code needs for the Applicant's project will be off-set through SDC credits or other forms of compensation.

24. APPLICANT RESPONSE TO "Items that are provided, but public works does not support as shown"

1. The "alleys" shown on the plans are not public streets. They are parking lots. Per Section 12.04.255 the site has other permanent provisions for private access to off street parking. These loops do not need to be public alleys.

2. The site plan has been revised to shown the intersection angle as 80 degrees. The Applicant believes the standard to deviate from the 90 degree intersection is sufficient. The Topography of this site is both natural and man-made. The natural topography would have the roadway maintain a most even elevation by following a non-90 degree route, along a line close to what we show on our plans. The Man-made topography includes a gas line easement through the site that necessitates an 80-degree intersection angle. Without this 80-degree angle optimal block sizes (as described in response to Code Sections 12.04.170 to 12.04.175) would not be possible. It is this optimal block size that is highly critical for setting the cornerstone of the future Beavercreek Road Concept Plan area.

3. A revised stormwater system is now shown on the plans which creates a stormwater detention pond for public roadways and some of the private parking lots. Underground piping is utilized under a private parking lot to detain water from the private portions of the site. A revised stormwater report discusses the split between public and private facilities and capacities of the systems.

ENGINEERS PLANNERS SURVEYORS

PRELIMINARY STORMWATER DESIGN REPORT

BEAVERCREEK LIVE/WORK DEVELOPMENT

Prepared For:
City of Oregon City, Oregon

June, 2014

Contact Person:
Brian D. Lee, PE
503.597.3222
brianl@paceengrs.com

PACE
An Engineering Services Company

PRELIMINARY STORMWATER DESIGN REPORT

BEAVERCREEK LIVE/WORK DEVELOPMENT

Prepared For:
City of Oregon City, Oregon

June, 2014

Contact Person:
Brian D. Lee, PE
503.597.3222
brianl@paceengrs.com

TABLE OF CONTENTS

1.0 PURPOSE OF REPORT
2.0 PROJECT LOCATION/DESCRIPTION
3.0 REGULATORY DESIGN CRITERIA
    3.1 STORMWATER QUANTITY MANAGEMENT CRITERIA
    3.2 STORMWATER QUALITY MANAGEMENT CRITERIA
    3.3 FLOOD PLAIN
4.0 SUMMARY OF STORMWATER DETENTION RESULTS
5.0 SOURCES OF INFORMATION AND DESIGN METHODOLOGY
6.0 DESIGN PARAMETERS
    6.1 DESIGN STORM
        6.1.1 STORMWATER DETENTION FACILITY DESIGN
        6.1.2 INLET AND CONDUIT SIZING
    6.2 PRE-DEVELOPED SITE TOPOGRAPHY AND LAND USE
        6.2.1 SITE TOPOGRAPHY
        6.2.2 LAND USE
        6.2.3 PRE-DEVELOPED INPUT PARAMETERS
    6.3 SOIL TYPE
    6.4 POST-DEVELOPED SITE TOPOGRAPHY AND LAND USE
        6.4.1 SITE TOPOGRAPHY
        6.4.2 LAND USE
        6.4.3 POST-DEVELOPED INPUT PARAMETERS
    6.5 DESCRIPTION OF OFF-SITE CONTRIBUTORY BASINS
7.0 CALCULATION METHODOLOGY
    7.1 PROPOSED STORMWATER CONDUIT SIZING AND INLET SPACING
    7.2 PROPOSED STORMWATER QUANTITY CONTROL FACILITY DESIGN
    7.3 PROPOSED STORMWATER QUALITY CONTROL FACILITY DESIGN
    7.4 ENERGY DISSIPATER CALCULATIONS
    7.5 DOWNSTREAM ANALYSIS
    7.6 CULVERT ANALYSIS
8.0 STORMWATER QUANTITY CONTROL FACILITY OPERATION
9.0 STORMWATER QUALITY CONTROL FACILITY OPERATION
10.0 STORMWATER DETENTION POND SAFEGUARDS

APPENDIX 1 - VICINITY MAP

APPENDIX 2 - PRE-DEVELOPED SITE HYDROGRAPHS AND FLOW DETAILS

APPENDIX 3 - POST-DEVELOPED HYDROGRAPH AND FLOW DETAILS

APPENDIX 4 - WATER QUALITY STRUCTURE CUT SHEETS

APPENDIX 5 - SAMPLE MAINTENANCE AGREEMENT

APPENDIX 6 - SOIL INFORMATION

PRELIMINARY STORMWATER REPORT
BEAVERCREEK LIVE/WORK DEVELOPMENT

1.0 PURPOSE OF REPORT

The purpose of this report is to documentation of the criteria for which the stormwater facility for this site was designed to meet, the sources of information upon which the analysis is based, the design methodology and the results of the analysis.

2.0 PROJECT LOCATION/DESCRIPTION

The proposed development is on approximately 9.59 acres located at 19896 Beavercreek Road in Oregon City, 97045. Also included in analysis is the area up to the centerline of Beavercreek road both in the pre-existing conditions and post development conditions.

The property is located within the Southeast one-quarter of section 10, township 3 South, Range 2 East, Willamette Meridian, City of Oregon City, Clackamas County, Oregon. It is also identified as Tax Lot 800, Clackamas County Assessor's Map No. 3S2E-10C.

Stormwater from the site is proposed to be routed to both a stormwater detention/water quality facility (in a separate tract) and an underground detention/infiltration chamber facility that will be constructed under common landscape areas at the low end of the property – See the preliminary site plan, grading plan and drainage utility plan for design details. The intent is that the runoff from the public streets (and 2 parking areas) will go into the pond that can be maintained by the City and the private streets (and remainder of the parking areas) will drain into the underground detention/infiltration chambers and be maintained by the property owner.

3.0 REGULATORY DESIGN CRITERIA

3.1 STORMWATER QUANTITY MANAGEMENT CRITERIA

As outlined in Chapter 4 of the City of Oregon City Stormwater and Grading Design standards the required stormwater quantity management criteria are summarized below:

- The post-development peak stormwater discharge rate from the site for the two-year, 24-hour duration design storm event shall at no time exceed half the pre-development peak stormwater runoff rate for the same design storm event.
- The post-development peak stormwater discharge rate from the site for the five-year, 24-hour duration design storm event shall at no time exceed the pre-development peak stormwater runoff rate for the same design storm event.
- The post-development peak stormwater discharge rate from the site for the 25-year, 24-hour duration design storm event shall at no time exceed the pre-development peak stormwater runoff rate for the ten-year, 24-hour duration design storm event.

The design storms are based on the standard SCS Type 1A rainfall distribution with a 24-hour distribution and a total depth of 2.6" (2-year), 3.1" (5-year), 3.4" (10-year), 4.0" (25-year), 4.4 (50-year) and 4.5" (100-year).

3.2 STORMWATER QUALITY MANAGEMENT CRITERIA

Ownership and Maintenance

Water quality for the development will be both a private and a publically maintained system. The private system will treat the runoff from the private streets and the commercial development and will be maintained by the property owners. The public system will treat the runoff from the public roadways, both internal and along Beavercreek Road. Accordingly, the developer will provide the City of Oregon City an access easement to maintain the public storm water quality facilities should it become necessary. Otherwise the operation and ownership of storm water quality facilities will be the responsibility of the developer. An operations and management manual for the storm water facilities will be provide to the City during final engineering design and before the issuance of building permits.

Water Quality Design Storm

The water quality design storm is 1/3 of the SCS 2-year / 24-hour design storm (0.87").

Proposed Water Quality Treatment Methods.

The water quality treatment will be achieved with several types of treatment. The main treatment will be by the use of stormwater quality filter cartridges that are a product of ConTech industries. Filter Cartridges will be installed in the water quality manholes (x2) in accordance with the manufactures sizing recommendations. The other type of treatment is a vegetative swale along Beavercreek Road. This facility will be similar to the North side of Beavercreek Road between Fir Street and Molalla Avenue. The net result will achieve the treatment of the design storm as discussed above.

3.3 FLOOD PLAIN

There are no flood plains shown on the Flood Insurance Rate Map (FIRM) produced by the Federal Emergency Management Agency (FEMA).

4.0 SUMMARY OF STORMWATER DETENTION RESULTS

Design Storm	Release Rate Pre-Developed Conditions (CFS)	Allowable Release Rate - Post Development (CFS)	Actual Release Rate – Post Development (CFS)
2-year	3.67	1.84	1.6
5-year	4.83	4.83	2.32
10-year	5.53	NA	NA
25-year	6.95	5.53	3.70

5.0 SOURCES OF INFORMATION AND DESIGN METHODOLOGY

The Santa Barbara Urban Hydrograph (SBUH) Method was used for the stormwater analysis. This method utilizes the SCS Type 1A 24-hour storm. HydroCAD software aided in the analysis. References are cited at the end of the report.

6.0 DESIGN PARAMETERS

6.1 DESIGN STORM

See Section 3.0 above. The Tc calculated for the Pre-Existing conditions 12.4 minutes. The pathway goes from the far corner of the lot, 300 feet of sheet flow across a grassy field, then 300 feet of shallow concentrated flow over grass pasture, then 400 along the roadside ditch all with slopes form 3.5% to 5.5%. The Tc for the Post Development conditions was calculated to be 14.1 minutes. The pathway is 100 feet of sheet slow across a grassy landscape area, then 250 feet of sheet flow across a parking area, then 500 feet through the storm pipe/ditch all with slopes from 2%-2.5% for the overland flow to 6% slope in the pipe/ditch. Under typical conditions the Tc for the Pre-developed condition would be longer than the Post-developed conditions. But this particular development the Post-condition is just a little longer that the Pre-condition due to changing of the slopes from 3.5%-4% to 2%-2.5% of the main flow path.

6.1.1 STORMWATER DETENTION FACILITY DESIGN

All of the flow results in stormwater summary Table 4.0 are incorporated in the detention pond and underground chamber sizing and analysis. The flow results stated in the table reflect the maximum flows released as seen in the roadside ditch along Beavercreek road.

6.1.2 INLET AND CONDUIT SIZING

The stormwater inlets (catch basins) for the site are placed according to the grading at all low points in grade and other necessary locations) and will adequately handle the stormwater for the site. Oversized catch basin curb inlets will be placed at all low points to increase flow capacity

that may be diminished seasonally due to deciduous trees. The distance between catch basins is generally less than 100 feet.

The stormwater pipes will be sized from the SBUH method to adequately convey up to the 25-year storm event (gravity flow). Flows above the 25 year event (e.g. a 100 year event) will flow through the systems using a combination of gravity flow and hydraulic surcharging (HGL above the top of pipe but 6 inches or more below the rim elevations of catch basins.

6.2 PRE-DEVELOPED SITE TOPOGRAPHY AND LAND USE

6.2.1 SITE TOPOGRAPHY

The site slopes to the north and west with slopes generally equal to or less than 6%.

6.2.2 EXISTING LAND USE

There is an existing home and barn at the southeast uppermost elevation of the site – generally the site is an open field that was previously cultivated.

6.2.3 PRE-DEVELOPED INPUT PARAMETERS

The input parameters are shown for the pre-developed sub catchment (basin) in the appendices.

6.3 SOIL TYPE

Below about 6" of topsoil, the soils consist mostly of silt with various traces of clay, sand and gravel. Occasional boulders were encountered from preliminary geotechnical site investigations. These soils are characterized as having a low stormwater infiltration potential. Within the depth of test pits observed on the site to depths of 15 plus feet, no groundwater was encountered. Per the City of Oregon City Stormwater and Grading Design Standards, these soils belong to Hydrologic soil group "C".

6.4 POST-DEVELOPED SITE TOPOGRAPHY AND LAND USE

6.4.1 SITE TOPOGRAPHY

The post-developed site topography will be altered from the pre-developed site topography to allow for the construction of streets, multifamily housing, live/work housing, a community center and a small commercial building. Surface cuts and fills may exceed 6 feet respectively. Please see the preliminary grading plans.

6.4.2 LAND USE

The current zoning on the property is MUC-1. See the development application for specific land uses and proposed improvements.

6.4.3 POST-DEVELOPED INPUT PARAMETERS

The input parameters are shown for the post-development subcatchment (basin) and detention pond and underground chambers in the appendices. The calculation method for determination of impervious area was to use AutoCAD and calculate areas of roof, concrete walk, asphalt, and landscape areas.

6.5 DESCRIPTION OF OFF-SITE CONTRIBUTORY BASINS

There are no off-site contributing areas. The development is located at the highest reaches of its containing watershed.

7.0 CALCULATION METHODOLOGY

7.1 PROPOSED STORMWATER CONDUIT SIZING AND INLET SPACING

The proposed stormwater pipes will be sized during final engineering from the SBUH method and will adequately convey the 25-year storm event (gravity flow). Flows above the 25 year event (e.g. a 100 year event) will flow through the systems using a combination of gravity flow and hydraulic surcharging (HGL above the top of pipe but 6 inches or more below the rim elevations of catch basins.

7.2 PROPOSED STORMWATER QUANTITY CONTROL (DETENTION) FACILITY DESIGN

The input parameters are shown for the subcatchments (basins) and the pond and underground chamber dimensions are shown in the appendices. They are determined by topographic survey information, aerial photos and contours, design, and analysis. The hydrographs were created with HydroCAD software.

7.3 PROPOSED STORMWATER QUALITY CONTROL FACILITY DESIGN

Half of the water quality design storm (1/3 of the 2-year storm) flow rate will be used to determine the type and quantity of cartridges for the water quality catch basins and manholes.

7.4 ENERGY DISSIPATER CALCULATIONS

Rip-rap will be placed at the inlet and outlet of the discharge to the roadside ditch along Beavercreek Road to act as an energy dissipater. The required rip-rap size shall be a minimum of Class 100.

7.5 DOWNSTREAM ANALYSIS

This site is located in the CAUFIELD Basin (designated in the City's Drainage Master Plan). Per *City of Oregon City Public Works Stormwater and Grading Design Standards (November 17,*

1999), the 10-year storm event is used for downstream analysis when the contributing drainage area is less than 40 acres The stormwater discharge from the on-site tank (post-developed condition) will discharge into the existing drainage way, as it currently does (pre-developed condition). The release (peak stormwater runoff) rates from the on-site detention pond for the 2, 5, 10 and 25 year storm events are less than the existing peak stormwater runoff rates for the same storm events at the existing outfall location. Therefore, the proposed development will not have any measurable increase in flow rates on the existing downstream conveyance systems during design storm events.

7.6 CULVERT ANALYSIS

No culverts are proposed on the site.

8.0 STORMWATER QUANTITY CONTROL FACILITY OPERATION

The control manhole will operate on gravity flow and will not require any operational control. Regular, routine maintenance to ensure that the orifices are clear of debris, the pipes are clear of sediment, and the outfall is not eroding the roadside ditch..

The grading and compaction guidelines from the *City of Oregon City Public Works Stormwater and Grading Design Standards (November 17, 1999)* shall be adhered to the maximum extent possible.

9.0 STORMWATER QUALITY CONTROL FACILITY OPERATION

The stormwater for the site will be routed through a series of water quality catch basins, pipes, and manholes. The catch basins will be sumped and the manholes will have treatment processes that through gravitational settling and biological processes and hydraulic residence time, water quality treatment will be achieved.

10.0 STORMWATER DETENTION POND SAFEGUARDS

Calculations for the 100-year storm event were done to size the emergency overflow. The pond and underground chambers will have an overflow pipe designed to adequately handle this storm event. If the outlet structure becomes plugged or for some other reason cannot convey the stormwater, then the stormwater will overflow through this emergency overflow. A channel lined with rip-rap will serve as an overflow to release stormwater in the event that the outlet structure is plugged. The emergency overflows are sized to accommodate the flows from the 100-year storm (assuming the outlet structure is plugged).

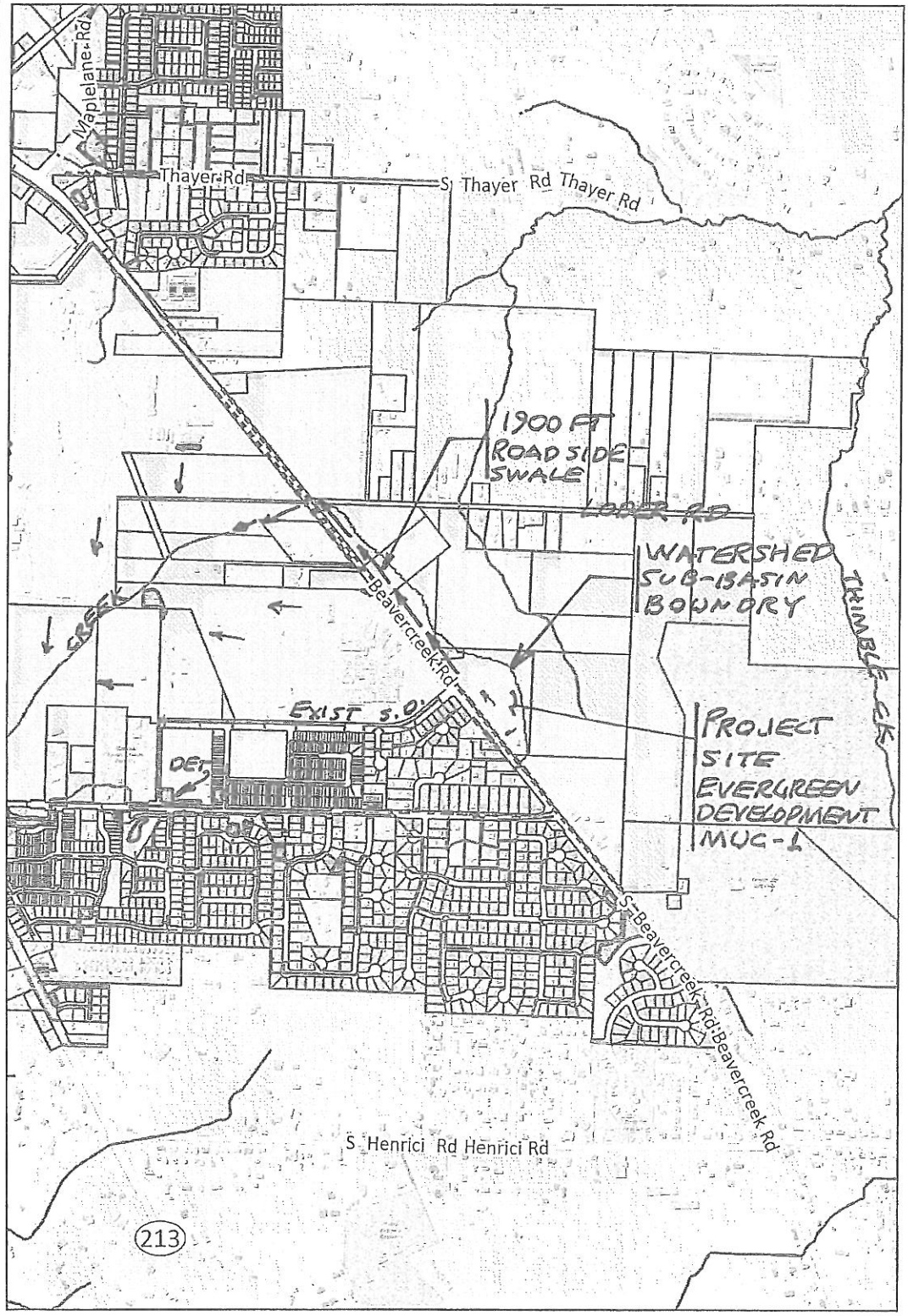
BEAVERCREEK ROAD
LIVE/WORK DEVELOPMENT

PRELIMINARY STORMWATER DESIGN REPORT
MAY 2014

Appendix 1

Vicinity Map

Oregon City GIS Map

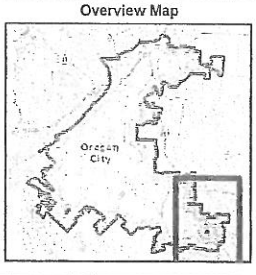


Legend

- Streams
  - Above Ground
  - Below Ground
- Taxlots
- Unimproved ROW
- Storm Conduits (City Owned)
  - Pipe
  - Culvert
  - Ditch
  - Detention Tank
- Storm Ponds
  - Pond
  - Swale
  - Man-Made Wetland
- City Limits
- UGB

Notes

Overview Map



N

0 1,246 Feet

1: 14,948

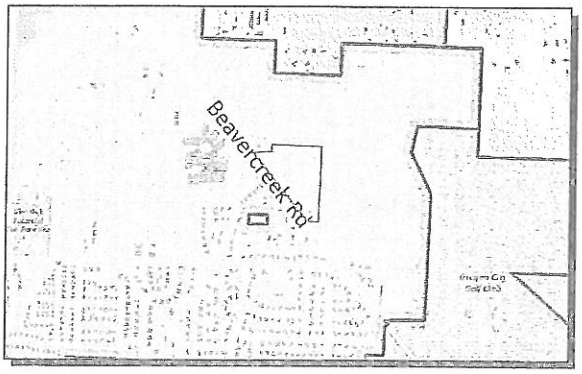
City of Oregon City
PO Box 3040
625 Center St
Oregon City
OR 97045
(503) 657-0891
www.orcity.org

OREGON CITY

Map created 1/7/2014

Taxlot Detail Report

Taxlot: 3-2E-10C -00800



Overview Map

Taxlot highlighted in blue

Taxlot Information

APN: 3-2E-10C -00800
Alt ID: 00870711
Site Address: 19896 BEAVERCREEK RD
OREGON CITY, OR 97045
Year Built: 1945

Taxpayer Information

Taxpayer: *Suppressed*
Address: *Suppressed*

Reference Information

Parcel Area (acres - approx): 9.7
Parcel Area (sq. ft. - approx): 423,403
Twn/Rng/Sec: 03S 02E 10
Tax Map Reference: 32E10C

Values

Mkt Values as of: 10/10/2012
Land Value (Mkt): $800,000
Building Value (Mkt): $1,500
Exempt Amount: $0
Net Value (Mkt): $801,500
Note: These are Market, NOT Assessed values.
Assessed Value: $224,097

Planning Designations

Zoning: MUC1
- Mixed Use Corridor District

Comprehensive Plan: muc
- Mixed Use - Corridor

Subdivision: NONE
PUD (if known):
Neighborhood Assn: Caufield NA
Urban Renewal District:
Historic District:
Historic Designated Structure? N
In Willamette Greenway? N
In Geologic Hazard? N
In Nat. Res. Overlay District (NROD)? N
In 1996 Floodplain? N

Report generated 12/19/2013 12:57 PM

City of Oregon City
PO Box 3040
625 Center St
Oregon City, OR 97045
(503) 657-0891
www.orcity.org

BEAVERCREEK ROAD
LIVE/WORK DEVELOPMENT

PRELIMINARY STORMWATER DESIGN REPORT
MAY 2014

Appendix 2

Pre-Developed Site Hydrographs and Flow Details

PRE

Subcat Reach Pond Link

Routing Diagram for BeaverCreek Road.PRE,BC.Road
Prepared by Hewlett-Packard Company, Printed 5/20/2014

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.450	79	50-75% Grass cover, Fair, HSG C (1S)
0.380	74	>75% Grass cover, Good, HSG C (1S)
9.090	90	Fallow, crop residue, Poor, HSG C (1S)
0.380	98	Paved roads w/curbs & sewers, HSG C (1S)
0.050	98	Unconnected roofs, HSG C (1S)
10.350	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
10.350	HSG C	1S
0.000	HSG D	
0.000	Other	
10.350		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchmer Numbers
0.000	0.000	0.450	0.000	0.000	0.450	50-75% Grass cover, Fair	1S
0.000	0.000	0.380	0.000	0.000	0.380	>75% Grass cover, Good	1S
0.000	0.000	9.090	0.000	0.000	9.090	Fallow, crop residue, Poor	1S
0.000	0.000	0.380	0.000	0.000	0.380	Paved roads w/curbs & sewers	1S
0.000	0.000	0.050	0.000	0.000	0.050	Unconnected roofs	1S
0.000	**0.000**	**10.350**	**0.000**	**0.000**	**10.350**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PRE Runoff Area=10.350 ac 4.15% Impervious Runoff Depth>1.34"
Flow Length=1,000' Tc=12.4 min CN=89/98 Runoff=3.67 cfs 1.160 af

Total Runoff Area = 10.350 ac Runoff Volume = 1.160 af Average Runoff Depth = 1.34"
95.85% Pervious = 9.920 ac 4.15% Impervious = 0.430 ac

Summary for Subcatchment 1S: PRE

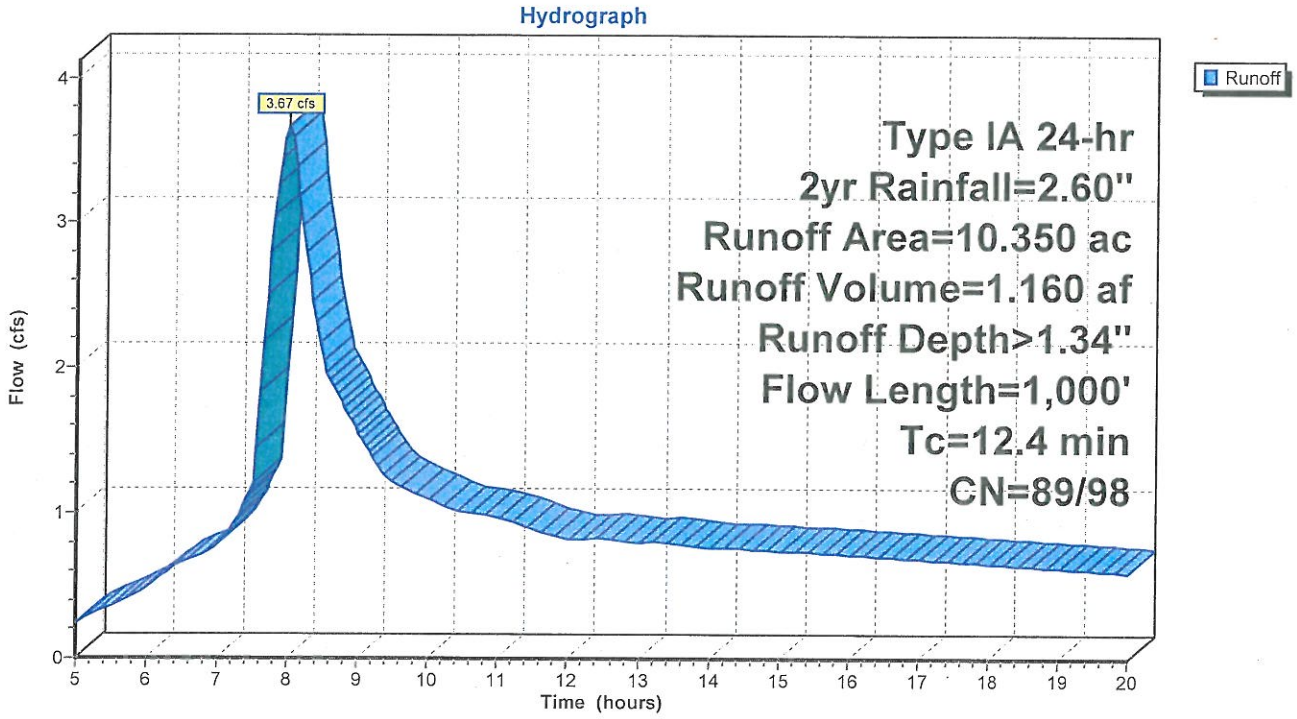
Runoff = 3.67 cfs @ 8.00 hrs, Volume= 1.160 af, Depth> 1.34"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2yr Rainfall=2.60"

Area (ac)	CN	Description
0.380	74	>75% Grass cover, Good, HSG C
0.380	98	Paved roads w/curbs & sewers, HSG C
0.050	98	Unconnected roofs, HSG C
0.450	79	50-75% Grass cover, Fair, HSG C
9.090	90	Fallow, crop residue, Poor, HSG C
10.350	89	Weighted Average
9.920	89	95.85% Pervious Area
0.430	98	4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	300	0.0350	0.58		**Sheet Flow, Grass Field** Fallow n= 0.050 P2= 2.60"
3.4	300	0.0450	1.48		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
0.3	400	0.0550	22.27	222.68	**Channel Flow, Ditch** Area= 10.0 sf Perim= 6.0' r= 1.67' n= 0.022 Earth, clean & straight
12.4	1,000	Total			

Subcatchment 1S: PRE



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PRE Runoff Area=10.350 ac 4.15% Impervious Runoff Depth>1.73"
Flow Length=1,000' Tc=12.4 min CN=89/98 Runoff=4.83 cfs 1.490 af

Total Runoff Area = 10.350 ac Runoff Volume = 1.490 af Average Runoff Depth = 1.73"
95.85% Pervious = 9.920 ac 4.15% Impervious = 0.430 ac

Summary for Subcatchment 1S: PRE

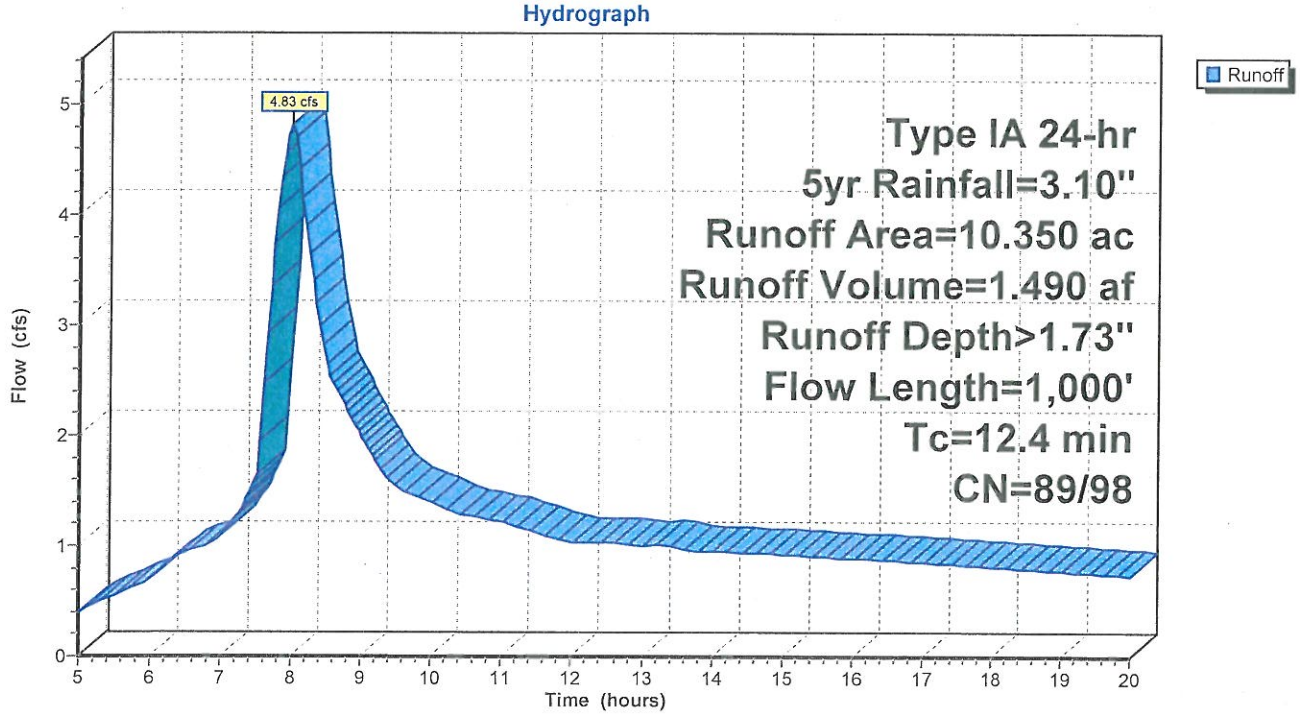
Runoff = 4.83 cfs @ 8.00 hrs, Volume= 1.490 af, Depth> 1.73"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5yr Rainfall=3.10"

Area (ac)	CN	Description
0.380	74	>75% Grass cover, Good, HSG C
0.380	98	Paved roads w/curbs & sewers, HSG C
0.050	98	Unconnected roofs, HSG C
0.450	79	50-75% Grass cover, Fair, HSG C
9.090	90	Fallow, crop residue, Poor, HSG C
10.350	89	Weighted Average
9.920	89	95.85% Pervious Area
0.430	98	4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	300	0.0350	0.58		**Sheet Flow, Grass Field** Fallow n= 0.050 P2= 2.60"
3.4	300	0.0450	1.48		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
0.3	400	0.0550	22.27	222.68	**Channel Flow, Ditch** Area= 10.0 sf Perim= 6.0' r= 1.67' n= 0.022 Earth, clean & straight
12.4	1,000	Total			

Subcatchment 1S: PRE



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PRE Runoff Area=10.350 ac 4.15% Impervious Runoff Depth>1.96"
Flow Length=1,000' Tc=12.4 min CN=89/98 Runoff=5.53 cfs 1.691 af

Total Runoff Area = 10.350 ac Runoff Volume = 1.691 af Average Runoff Depth = 1.96"
95.85% Pervious = 9.920 ac 4.15% Impervious = 0.430 ac

Summary for Subcatchment 1S: PRE

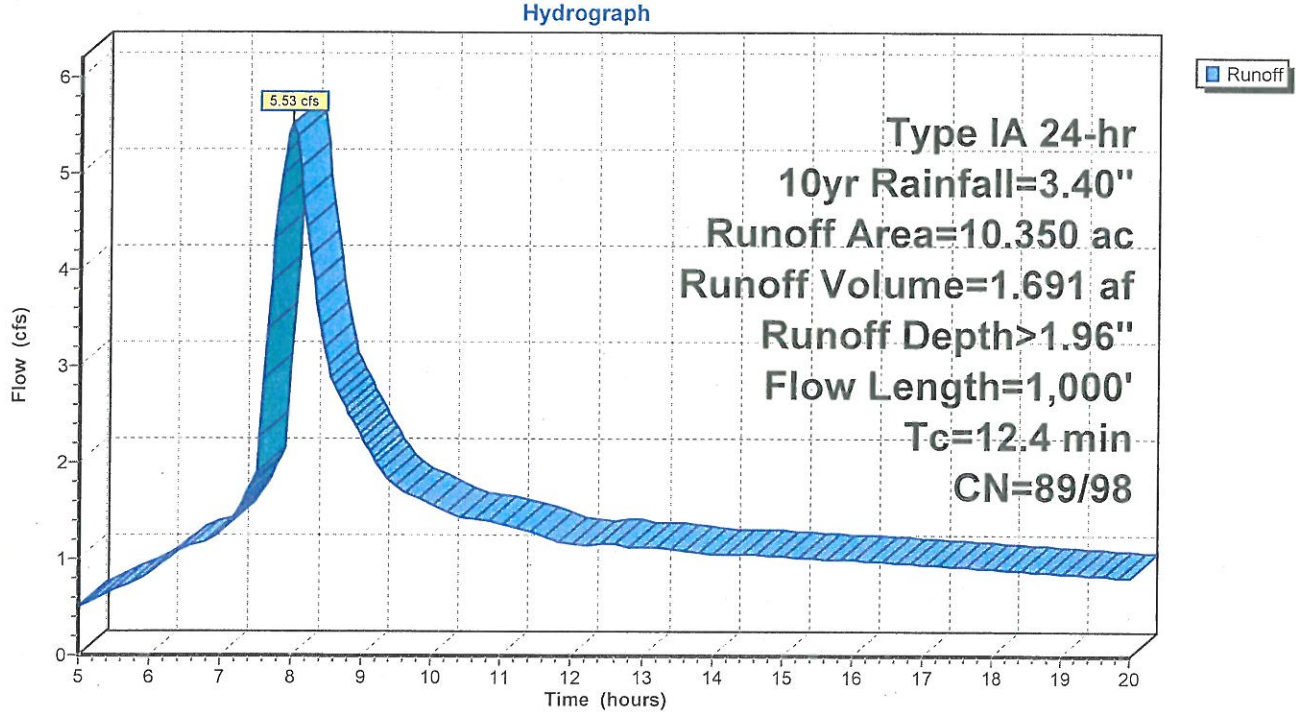
Runoff = 5.53 cfs @ 8.00 hrs, Volume= 1.691 af, Depth> 1.96"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10yr Rainfall=3.40"

Area (ac)	CN	Description
0.380	74	>75% Grass cover, Good, HSG C
0.380	98	Paved roads w/curbs & sewers, HSG C
0.050	98	Unconnected roofs, HSG C
0.450	79	50-75% Grass cover, Fair, HSG C
9.090	90	Fallow, crop residue, Poor, HSG C
10.350	89	Weighted Average
9.920	89	95.85% Pervious Area
0.430	98	4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	300	0.0350	0.58		**Sheet Flow, Grass Field** Fallow n= 0.050 P2= 2.60"
3.4	300	0.0450	1.48		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
0.3	400	0.0550	22.27	222.68	**Channel Flow, Ditch** Area= 10.0 sf Perim= 6.0' r= 1.67' n= 0.022 Earth, clean & straight
12.4	1,000	Total			

Subcatchment 1S: PRE



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PRE Runoff Area=10.350 ac 4.15% Impervious Runoff Depth>2.43"
Flow Length=1,000' Tc=12.4 min CN=89/98 Runoff=6.95 cfs 2.097 af

Total Runoff Area = 10.350 ac Runoff Volume = 2.097 af Average Runoff Depth = 2.43"
95.85% Pervious = 9.920 ac 4.15% Impervious = 0.430 ac

Summary for Subcatchment 1S: PRE

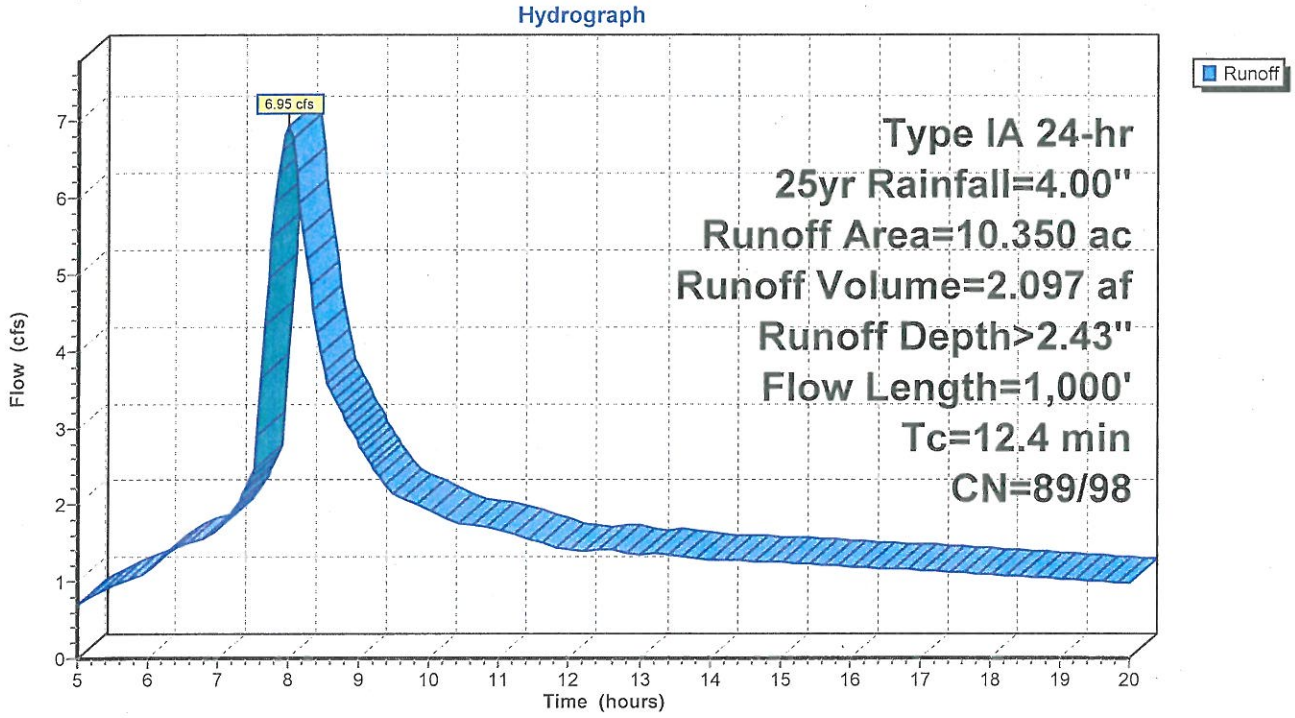
Runoff = 6.95 cfs @ 8.00 hrs, Volume= 2.097 af, Depth> 2.43"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25yr Rainfall=4.00"

Area (ac)	CN	Description
0.380	74	>75% Grass cover, Good, HSG C
0.380	98	Paved roads w/curbs & sewers, HSG C
0.050	98	Unconnected roofs, HSG C
0.450	79	50-75% Grass cover, Fair, HSG C
9.090	90	Fallow, crop residue, Poor, HSG C
10.350	89	Weighted Average
9.920	89	95.85% Pervious Area
0.430	98	4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	300	0.0350	0.58		**Sheet Flow, Grass Field** Fallow n= 0.050 P2= 2.60"
3.4	300	0.0450	1.48		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
0.3	400	0.0550	22.27	222.68	**Channel Flow, Ditch** Area= 10.0 sf Perim= 6.0' r= 1.67' n= 0.022 Earth, clean & straight
12.4	1,000	Total			

Subcatchment 1S: PRE

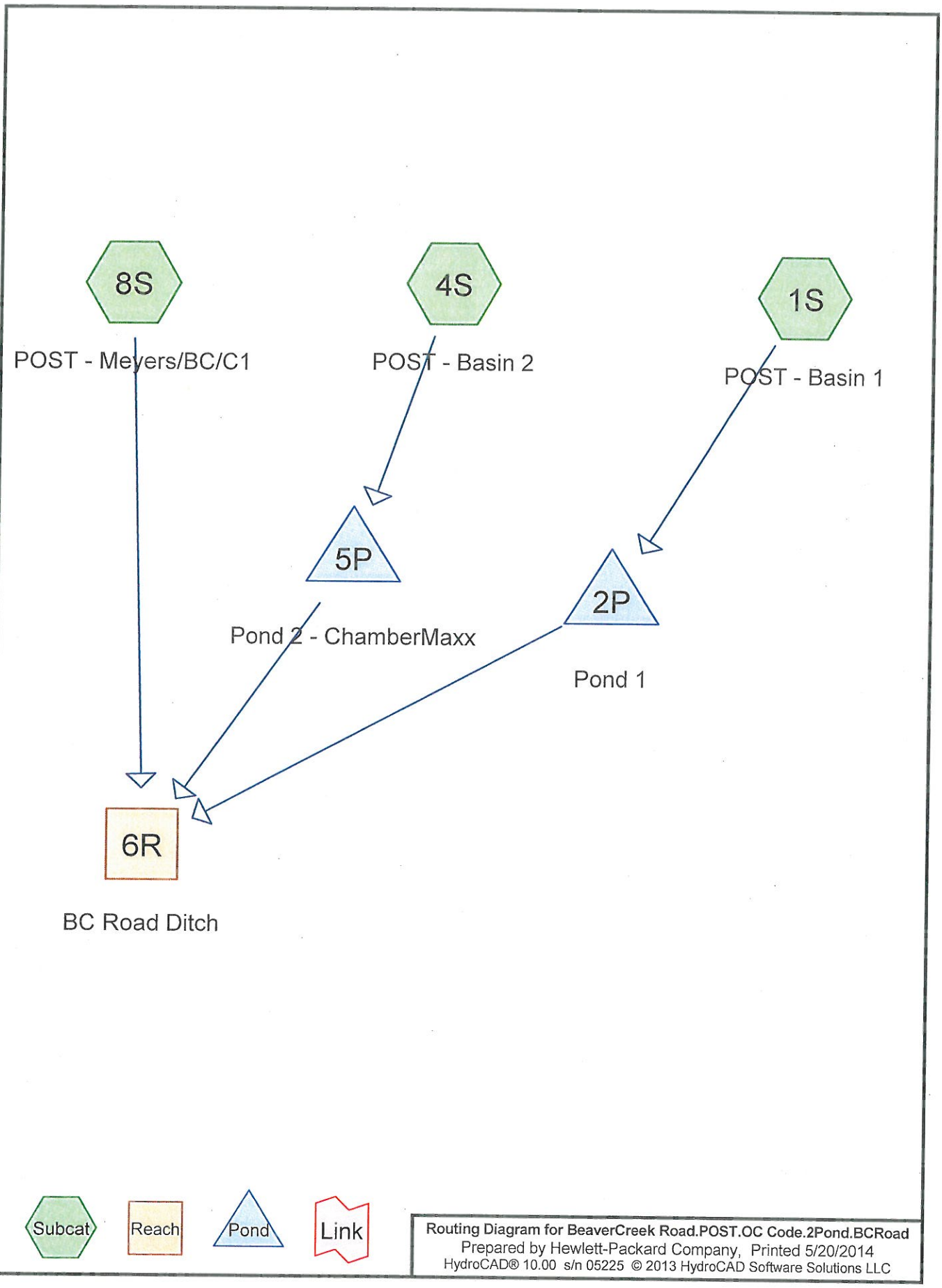


BEAVERCREEK ROAD
LIVE/WORK DEVELOPMENT

PRELIMINARY STORMWATER DESIGN REPORT
MAY 2014

Appendix 3

Post-Developed Site Hydrographs and Flow Details



Routing Diagram for BeaverCreek Road.POST.OC Code.2Pond.BCRoad
Prepared by Hewlett-Packard Company, Printed 5/20/2014

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.487	74	>75% Grass cover, Good, HSG C (1S, 4S, 8S)
4.106	98	Paved parking, HSG C (1S, 4S, 8S)
1.871	98	Roofs, HSG C (1S, 4S, 8S)
0.889	98	Unconnected pavement, HSG C (1S, 4S, 8S)
10.353	**90**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
10.353	HSG C	1S, 4S, 8S
0.000	HSG D	
0.000	Other	
10.353		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	3.487	0.000	0.000	3.487	>75% Grass cover, Good	1S, 4S, 8S
0.000	0.000	4.106	0.000	0.000	4.106	Paved parking	1S, 4S, 8S
0.000	0.000	1.871	0.000	0.000	1.871	Roofs	1S, 4S, 8S
0.000	0.000	0.889	0.000	0.000	0.889	Unconnected pavement	1S, 4S, 8S
0.000	**0.000**	**10.353**	**0.000**	**0.000**	**10.353**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1S	0.00	0.00	500.0	0.0600	0.010	12.0	0.0	0.0
2	4S	0.00	0.00	500.0	0.0600	0.010	12.0	0.0	0.0
3	8S	0.00	0.00	500.0	0.0600	0.010	12.0	0.0	0.0
4	2P	473.50	473.00	50.0	0.0100	0.010	36.0	0.0	0.0
5	5P	473.00	470.50	50.0	0.0500	0.010	12.0	0.0	0.0

Time span=1.00-24.00 hrs, dt=0.05 hrs, 461 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: POST - Basin 1 Runoff Area=5.348 ac 69.82% Impervious Runoff Depth>1.85"
Flow Length=850' Tc=14.1 min CN=74/98 Runoff=2.14 cfs 0.822 af

Subcatchment 4S: POST - Basin 2 Runoff Area=1.832 ac 71.62% Impervious Runoff Depth>1.88"
Flow Length=850' Tc=14.1 min CN=74/98 Runoff=0.75 cfs 0.286 af

Subcatchment 8S: POST - Meyers/BC/C1 Runoff Area=3.173 ac 57.36% Impervious Runoff Depth>1.63"
Flow Length=850' Tc=14.1 min CN=74/98 Runoff=1.09 cfs 0.432 af

Reach 6R: BC Road Ditch Avg. Flow Depth=0.19' Max Vel=3.65 fps Inflow=1.60 cfs 1.344 af
n=0.030 L=10.0' S=0.0650 '/' Capacity=407.12 cfs Outflow=1.60 cfs 1.344 af

Pond 2P: Pond 1 Peak Elev=476.93' Storage=0.241 af Inflow=2.14 cfs 0.822 af
Outflow=0.63 cfs 0.718 af

Pond 5P: Pond 2 - ChamberMaxx Peak Elev=474.38' Storage=0.102 af Inflow=0.75 cfs 0.286 af
Outflow=0.33 cfs 0.194 af

Total Runoff Area = 10.353 ac Runoff Volume = 1.541 af Average Runoff Depth = 1.79"
33.68% Pervious = 3.487 ac 66.32% Impervious = 6.866 ac

Summary for Subcatchment 1S: POST - Basin 1

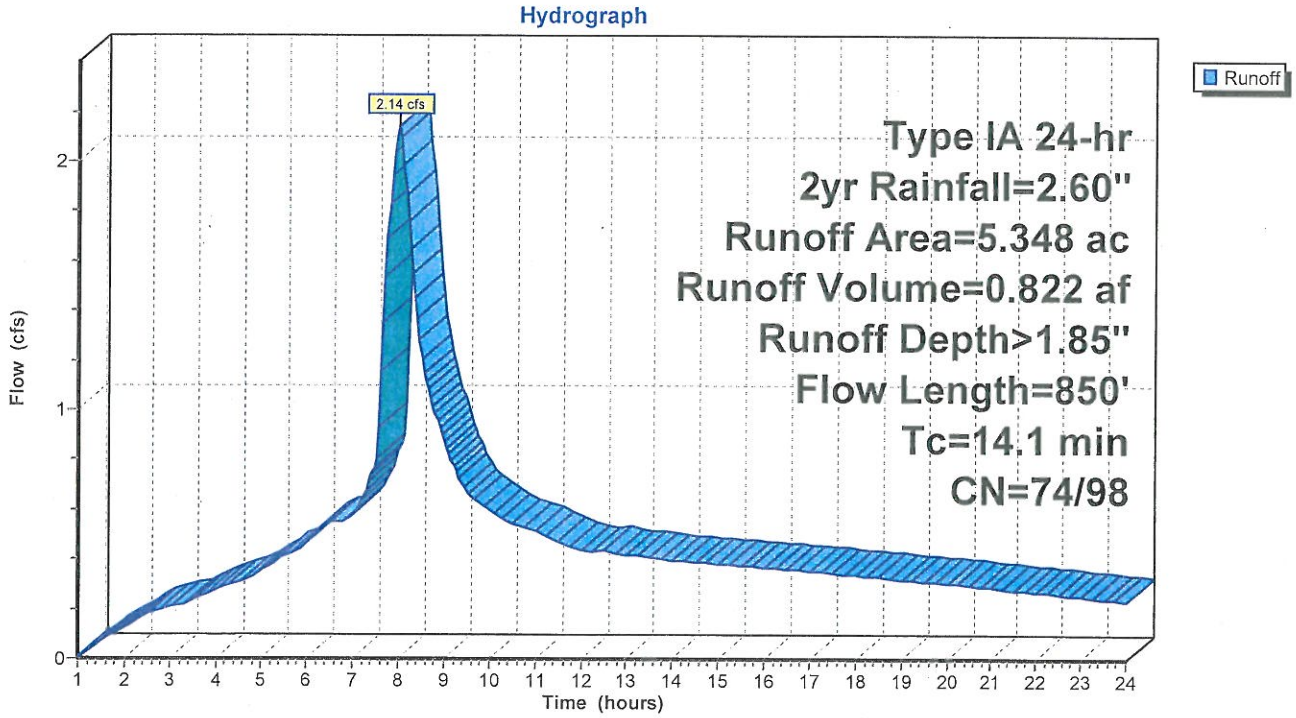
Runoff = 2.14 cfs @ 8.00 hrs, Volume= 0.822 af, Depth> 1.85"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2yr Rainfall=2.60"

Area (ac)	CN	Description
1.614	74	>75% Grass cover, Good, HSG C
0.486	98	Unconnected pavement, HSG C
2.119	98	Paved parking, HSG C
1.129	98	Roofs, HSG C
5.348	91	Weighted Average
1.614	74	30.18% Pervious Area
3.734	98	69.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 1S: POST - Basin 1



Summary for Subcatchment 4S: POST - Basin 2

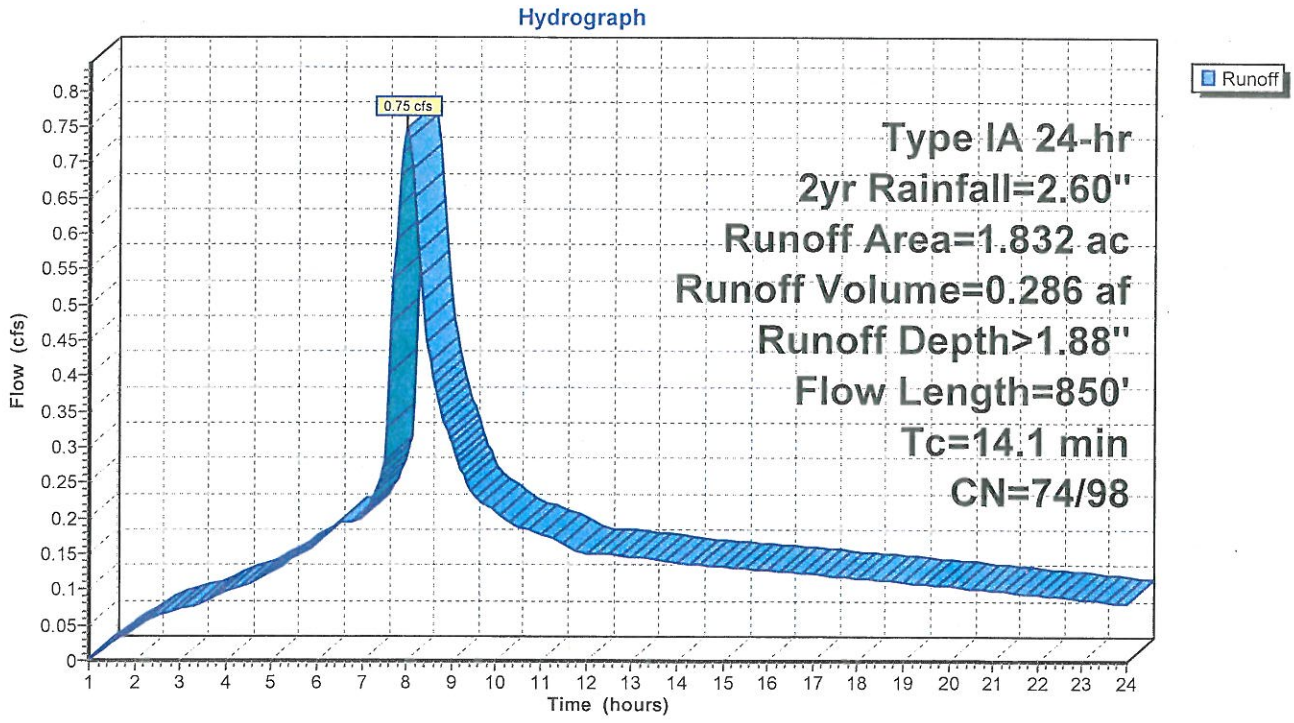
Runoff = 0.75 cfs @ 8.00 hrs, Volume= 0.286 af, Depth> 1.88"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2yr Rainfall=2.60"

Area (ac)	CN	Description
0.520	74	>75% Grass cover, Good, HSG C
0.086	98	Unconnected pavement, HSG C
0.620	98	Paved parking, HSG C
0.606	98	Roofs, HSG C
1.832	91	Weighted Average
0.520	74	28.38% Pervious Area
1.312	98	71.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 4S: POST - Basin 2



Summary for Subcatchment 8S: POST - Meyers/BC/C1

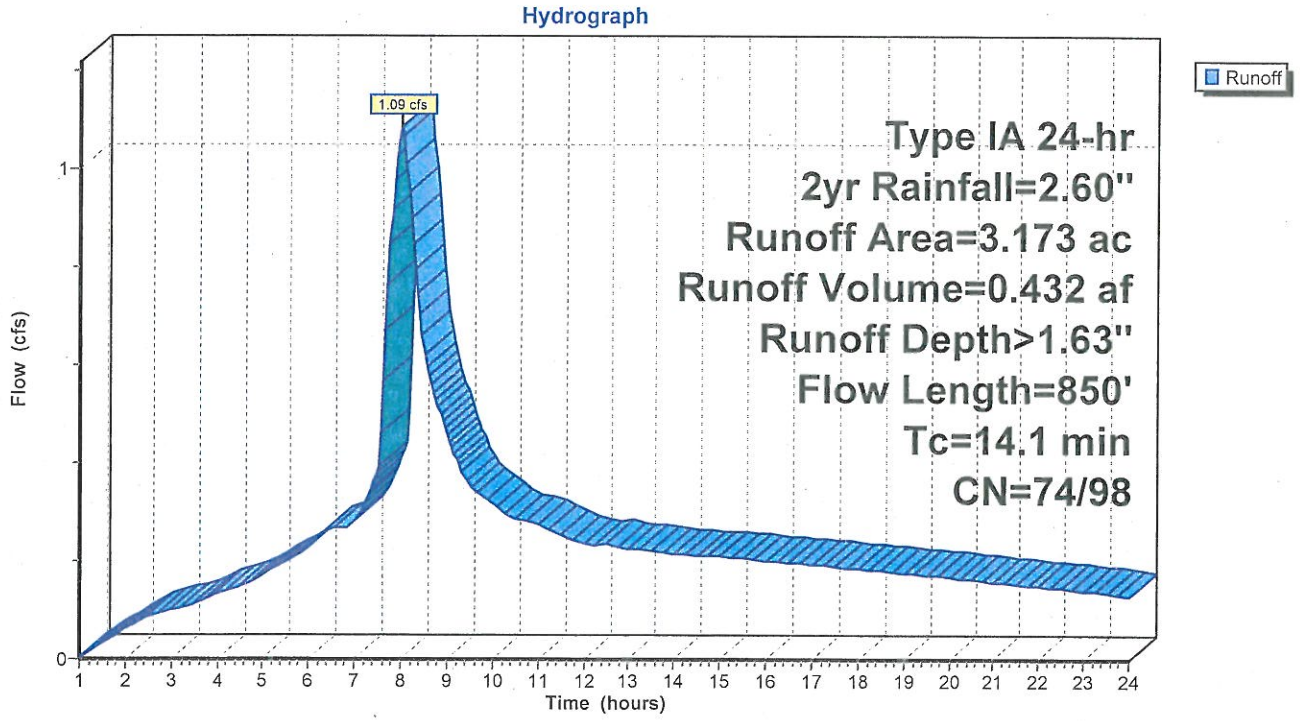
Runoff = 1.09 cfs @ 8.00 hrs, Volume= 0.432 af, Depth> 1.63"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2yr Rainfall=2.60"

Area (ac)	CN	Description
1.353	74	>75% Grass cover, Good, HSG C
0.317	98	Unconnected pavement, HSG C
1.367	98	Paved parking, HSG C
0.136	98	Roofs, HSG C
3.173	88	Weighted Average
1.353	74	42.64% Pervious Area
1.820	98	57.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 8S: POST - Meyers/BC/C1



Summary for Reach 6R: BC Road Ditch

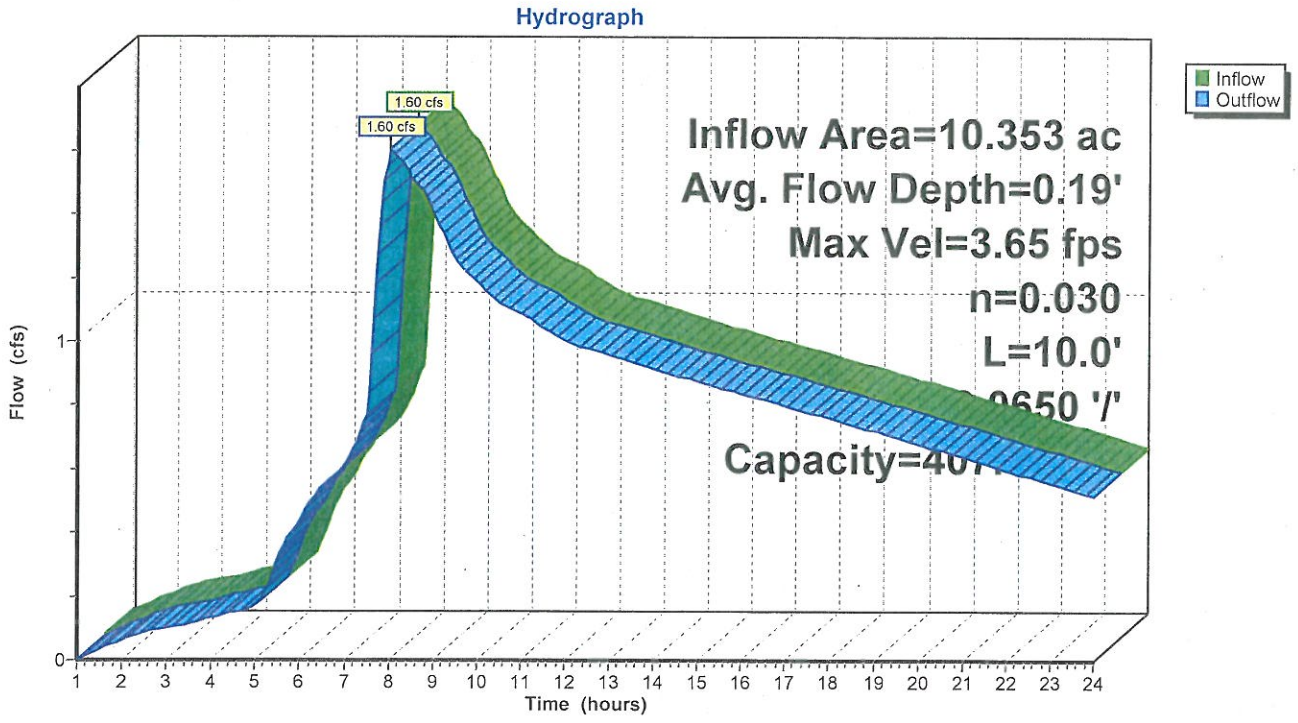
[82] Warning: Early inflow requires earlier time span

Inflow Area = 10.353 ac, 66.32% Impervious, Inflow Depth > 1.56" for 2yr event
Inflow = 1.60 cfs @ 8.04 hrs, Volume= 1.344 af
Outflow = 1.60 cfs @ 8.04 hrs, Volume= 1.344 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.65 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.63 fps, Avg. Travel Time= 0.1 min

Peak Storage= 4 cf @ 8.04 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 407.12 cfs

2.00' x 3.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 10.0' Slope= 0.0650 '/'
Inlet Invert= 470.00', Outlet Invert= 469.35'



Summary for Pond 2P: Pond 1

[82] Warning: Early inflow requires earlier time span

Inflow Area = 5.348 ac, 69.82% Impervious, Inflow Depth > 1.85" for 2yr event
Inflow = 2.14 cfs @ 8.00 hrs, Volume= 0.822 af
Outflow = 0.63 cfs @ 9.73 hrs, Volume= 0.718 af, Atten= 71%, Lag= 103.6 min
Primary = 0.63 cfs @ 9.73 hrs, Volume= 0.718 af

Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 476.93' @ 9.73 hrs Surf.Area= 0.094 ac Storage= 0.241 af

Plug-Flow detention time= 245.0 min calculated for 0.716 af (87% of inflow)
Center-of-Mass det. time= 158.2 min (859.9 - 701.7)

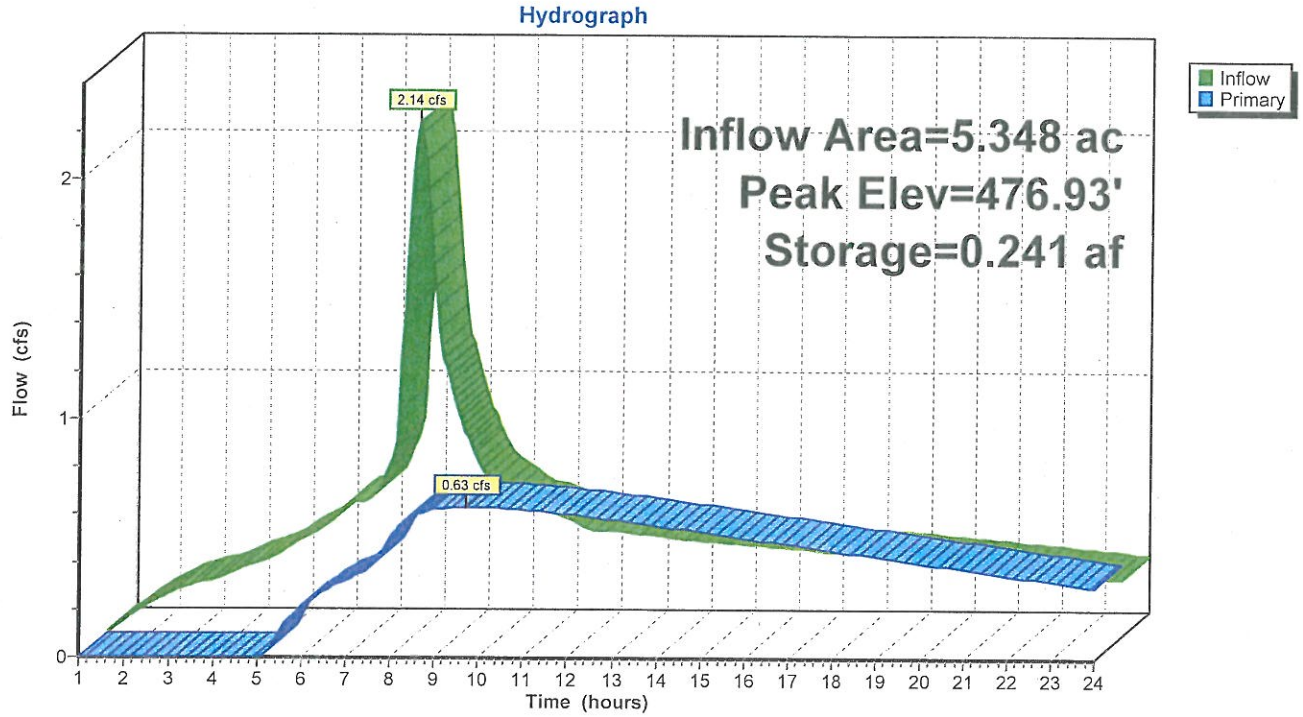
Volume	Invert	Avail.Storage	Storage Description
#1	473.00'	0.479 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
473.00	0.035	0.000	0.000
474.00	0.046	0.040	0.040
475.00	0.061	0.053	0.094
476.00	0.076	0.068	0.162
477.00	0.095	0.085	0.248
478.00	0.117	0.106	0.354
479.00	0.133	0.125	0.479

Device	Routing	Invert	Outlet Devices
#1	Primary	473.50'	**36.0" Round CMP_Round 36"** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 473.50' / 473.00' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	474.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	477.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.63 cfs @ 9.73 hrs HW=476.93' (Free Discharge)
↑└─**1=CMP_Round 36"** (Passes 0.63 cfs of 46.65 cfs potential flow)
↑ ├─**2=Orifice/Grate** (Orifice Controls 0.63 cfs @ 7.24 fps)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: Pond 1



Summary for Pond 5P: Pond 2 - ChamberMaxx

[82] Warning: Early inflow requires earlier time span

Inflow Area = 1.832 ac, 71.62% Impervious, Inflow Depth > 1.88" for 2yr event
Inflow = 0.75 cfs @ 8.00 hrs, Volume= 0.286 af
Outflow = 0.33 cfs @ 8.85 hrs, Volume= 0.194 af, Atten= 56%, Lag= 51.1 min
Primary = 0.33 cfs @ 8.85 hrs, Volume= 0.194 af

Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 474.38' @ 8.85 hrs Surf.Area= 0.067 ac Storage= 0.102 af

Plug-Flow detention time= 364.8 min calculated for 0.194 af (68% of inflow)
Center-of-Mass det. time= 170.0 min (870.0 - 699.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	472.00'	0.085 af	**39.77'W x 73.49'L x 4.53'H Field A** 0.304 af Overall - 0.091 af Embedded = 0.213 af x 40.0% Voids
#2A	473.00'	0.091 af	**Contech ChamberMaxx** x 80 Inside #1 Effective Size= 49.6"W x 30.0"H => 6.92 sf x 7.12'L = 49.3 cf Overall Size= 51.4"W x 30.3"H x 7.58'L with 0.47' Overlap Row Length Adjustment= +0.32' x 6.92 sf x 8 rows
		0.176 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	473.00'	**12.0" Round Culvert** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 473.00' / 470.50' S= 0.0500 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	474.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.33 cfs @ 8.85 hrs HW=474.38' (Free Discharge)
↑**1=Culvert** (Passes 0.33 cfs of 3.54 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.33 cfs @ 2.09 fps)

Pond 5P: Pond 2 - ChamberMaxx - Chamber Wizard Field A

Chamber Model = Contech ChamberMaxx
Effective Size= 49.6"W x 30.0"H => 6.92 sf x 7.12'L = 49.3 cf
Overall Size= 51.4"W x 30.3"H x 7.58'L with 0.47' Overlap
Row Length Adjustment= +0.32' x 6.92 sf x 8 rows

51.4" Wide + 6.0" Spacing = 57.4" C-C Row Spacing

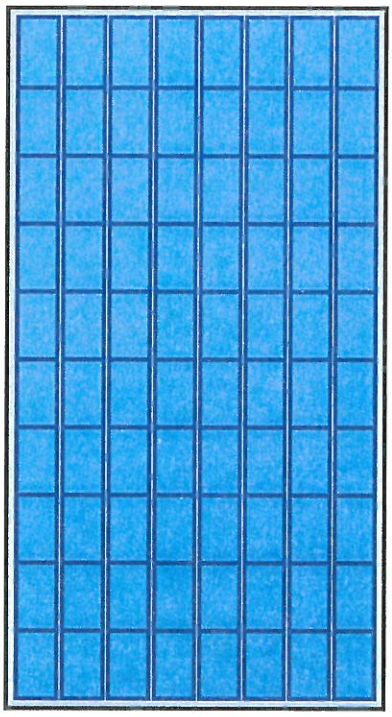
10 Chambers/Row x 7.12' Long +0.32' Row Adjustment = 71.49' Row Length +12.0" End Stone x 2 = 73.49' Base Length
8 Rows x 51.4" Wide + 6.0" Spacing x 7 + 12.0" Side Stone x 2 = 39.77' Base Width
12.0" Base + 30.3" Chamber Height + 12.0" Cover = 4.53' Field Height

80 Chambers x 49.3 cf +0.32' Row Adjustment x 6.92 sf x 8 Rows = 3,958.4 cf Chamber Storage

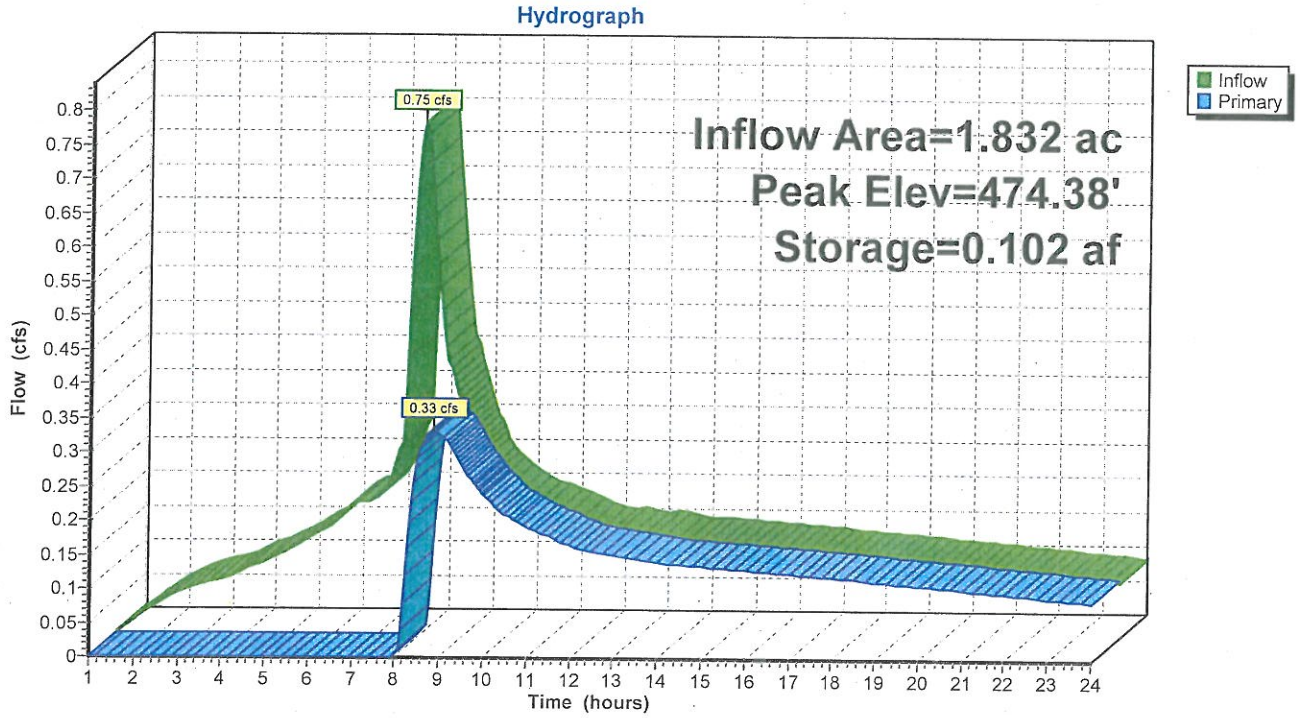
13,223.5 cf Field - 3,958.4 cf Chambers = 9,265.1 cf Stone x 40.0% Voids = 3,706.1 cf Stone Storage

Chamber Storage + Stone Storage = 7,664.4 cf = 0.176 af
Overall Storage Efficiency = 58.0%

80 Chambers
489.8 cy Field
343.2 cy Stone



Pond 5P: Pond 2 - ChamberMaxx



Time span=1.00-24.00 hrs, dt=0.05 hrs, 461 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: POST - Basin 1 Runoff Area=5.348 ac 69.82% Impervious Runoff Depth>2.28"
Flow Length=850' Tc=14.1 min CN=74/98 Runoff=2.66 cfs 1.017 af

Subcatchment 4S: POST - Basin 2 Runoff Area=1.832 ac 71.62% Impervious Runoff Depth>2.32"
Flow Length=850' Tc=14.1 min CN=74/98 Runoff=0.93 cfs 0.354 af

Subcatchment 8S: POST - Meyers/BC/C1 Runoff Area=3.173 ac 57.36% Impervious Runoff Depth>2.05"
Flow Length=850' Tc=14.1 min CN=74/98 Runoff=1.38 cfs 0.541 af

Reach 6R: BC Road Ditch Avg. Flow Depth=0.23' Max Vel=4.12 fps Inflow=2.32 cfs 1.691 af
n=0.030 L=10.0' S=0.0650 '/' Capacity=407.12 cfs Outflow=2.32 cfs 1.691 af

Pond 2P: Pond 1 Peak Elev=477.35' Storage=0.282 af Inflow=2.66 cfs 1.017 af
Outflow=0.98 cfs 0.889 af

Pond 5P: Pond 2 - ChamberMaxx Peak Elev=474.56' Storage=0.112 af Inflow=0.93 cfs 0.354 af
Outflow=0.53 cfs 0.261 af

Total Runoff Area = 10.353 ac Runoff Volume = 1.913 af Average Runoff Depth = 2.22"
33.68% Pervious = 3.487 ac 66.32% Impervious = 6.866 ac

Summary for Subcatchment 1S: POST - Basin 1

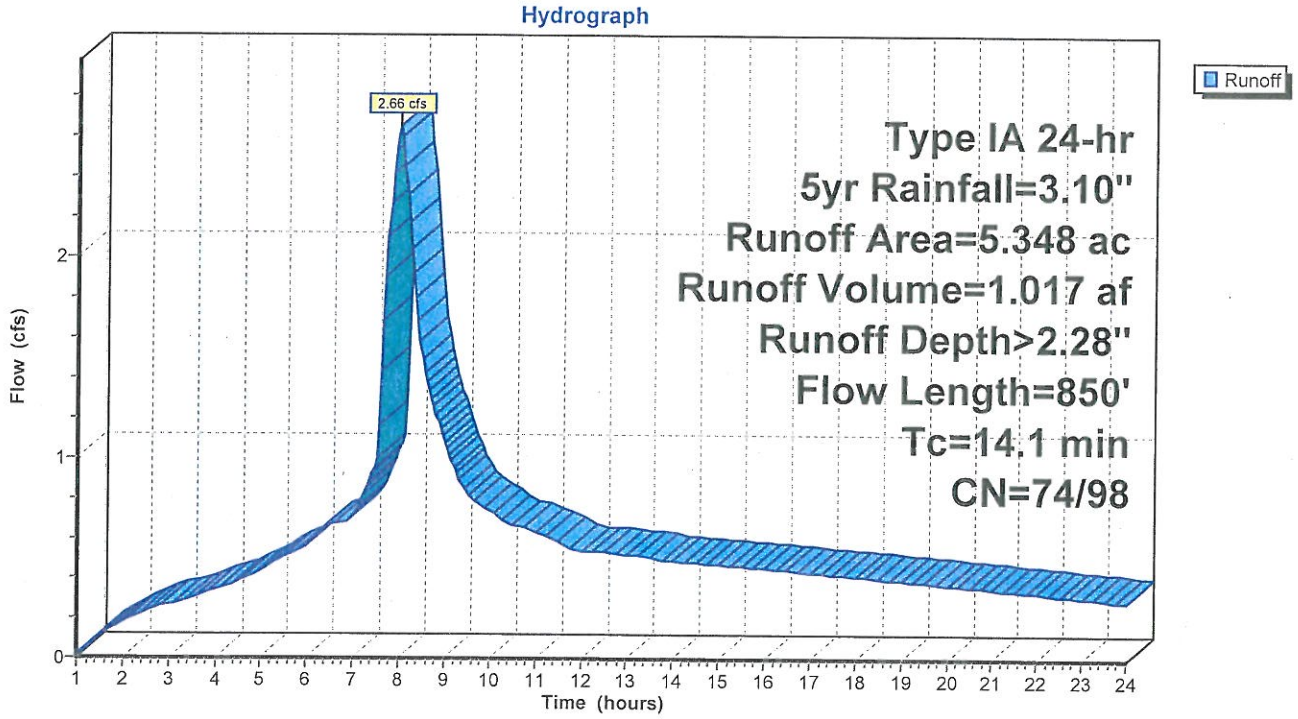
Runoff = 2.66 cfs @ 8.00 hrs, Volume= 1.017 af, Depth> 2.28"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5yr Rainfall=3.10"

Area (ac)	CN	Description
1.614	74	>75% Grass cover, Good, HSG C
0.486	98	Unconnected pavement, HSG C
2.119	98	Paved parking, HSG C
1.129	98	Roofs, HSG C
5.348	91	Weighted Average
1.614	74	30.18% Pervious Area
3.734	98	69.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 1S: POST - Basin 1



Summary for Subcatchment 4S: POST - Basin 2

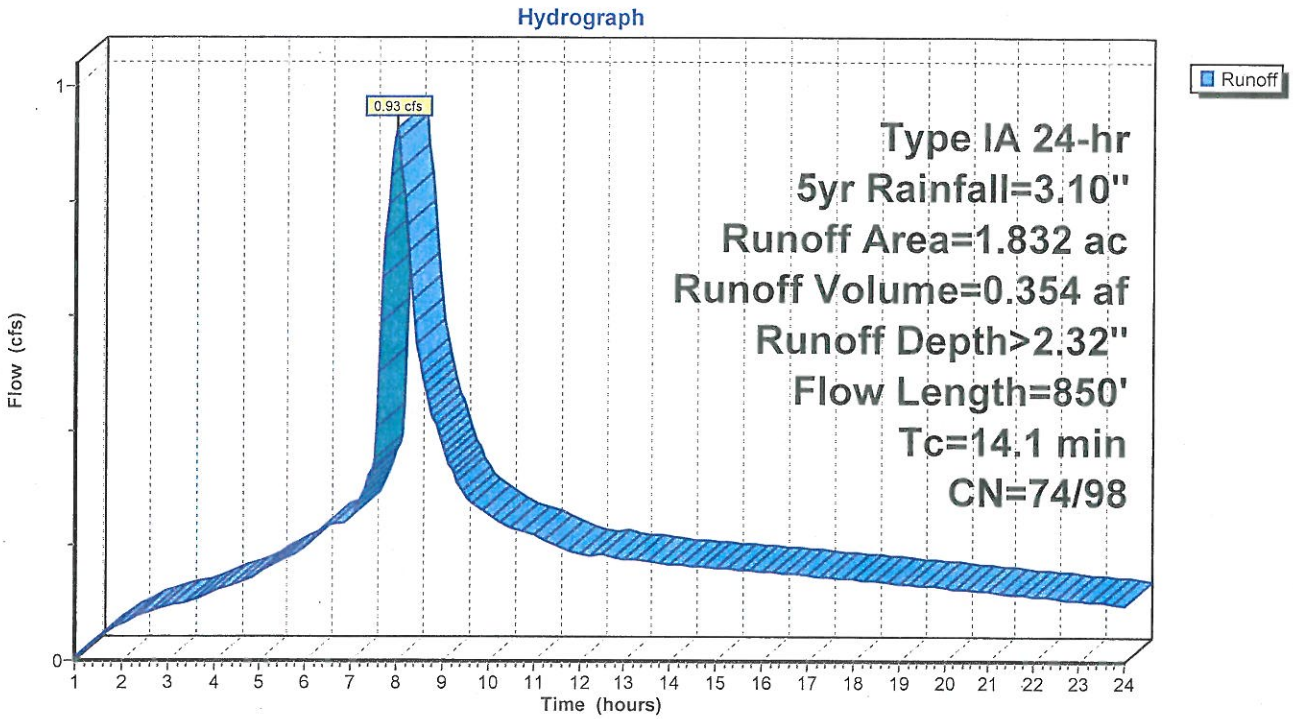
Runoff = 0.93 cfs @ 8.00 hrs, Volume= 0.354 af, Depth> 2.32"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5yr Rainfall=3.10"

Area (ac)	CN	Description
0.520	74	>75% Grass cover, Good, HSG C
0.086	98	Unconnected pavement, HSG C
0.620	98	Paved parking, HSG C
0.606	98	Roofs, HSG C
1.832	91	Weighted Average
0.520	74	28.38% Pervious Area
1.312	98	71.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 4S: POST - Basin 2



Summary for Subcatchment 8S: POST - Meyers/BC/C1

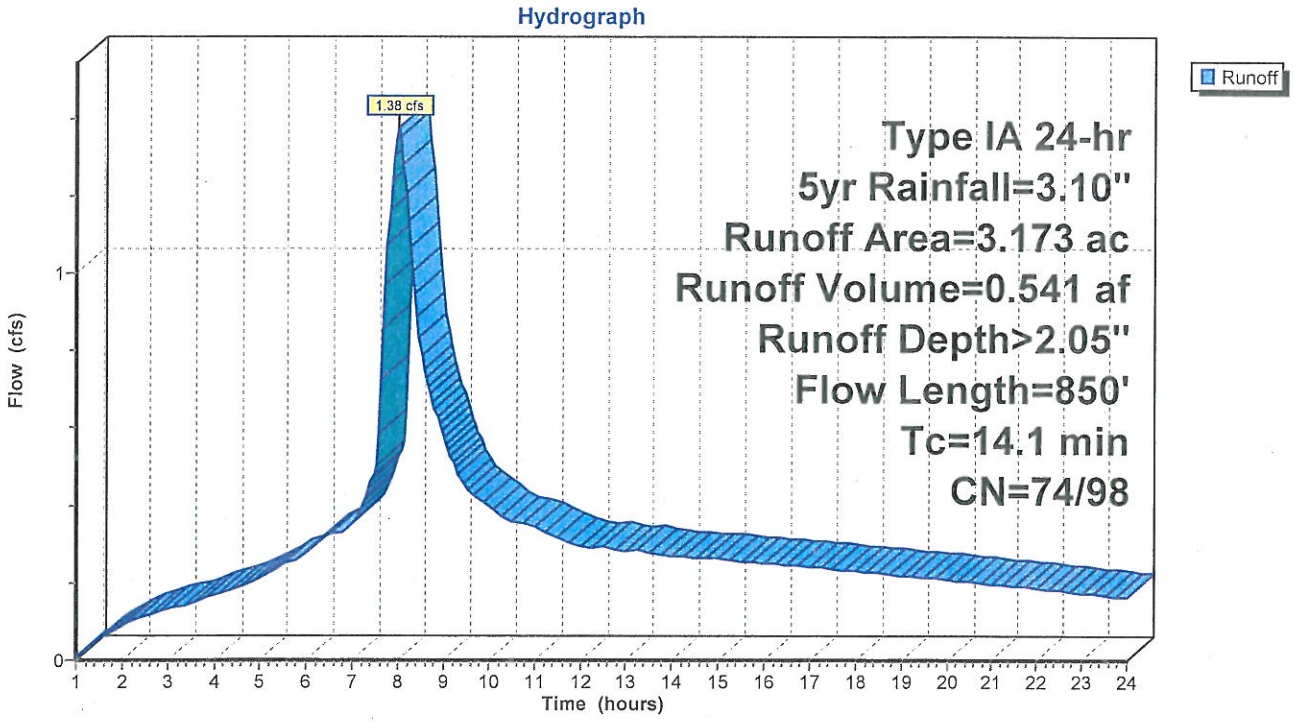
Runoff = 1.38 cfs @ 8.00 hrs, Volume= 0.541 af, Depth> 2.05"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5yr Rainfall=3.10"

Area (ac)	CN	Description
1.353	74	>75% Grass cover, Good, HSG C
0.317	98	Unconnected pavement, HSG C
1.367	98	Paved parking, HSG C
0.136	98	Roofs, HSG C
3.173	88	Weighted Average
1.353	74	42.64% Pervious Area
1.820	98	57.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 8S: POST - Meyers/BC/C1



Summary for Reach 6R: BC Road Ditch

[82] Warning: Early inflow requires earlier time span

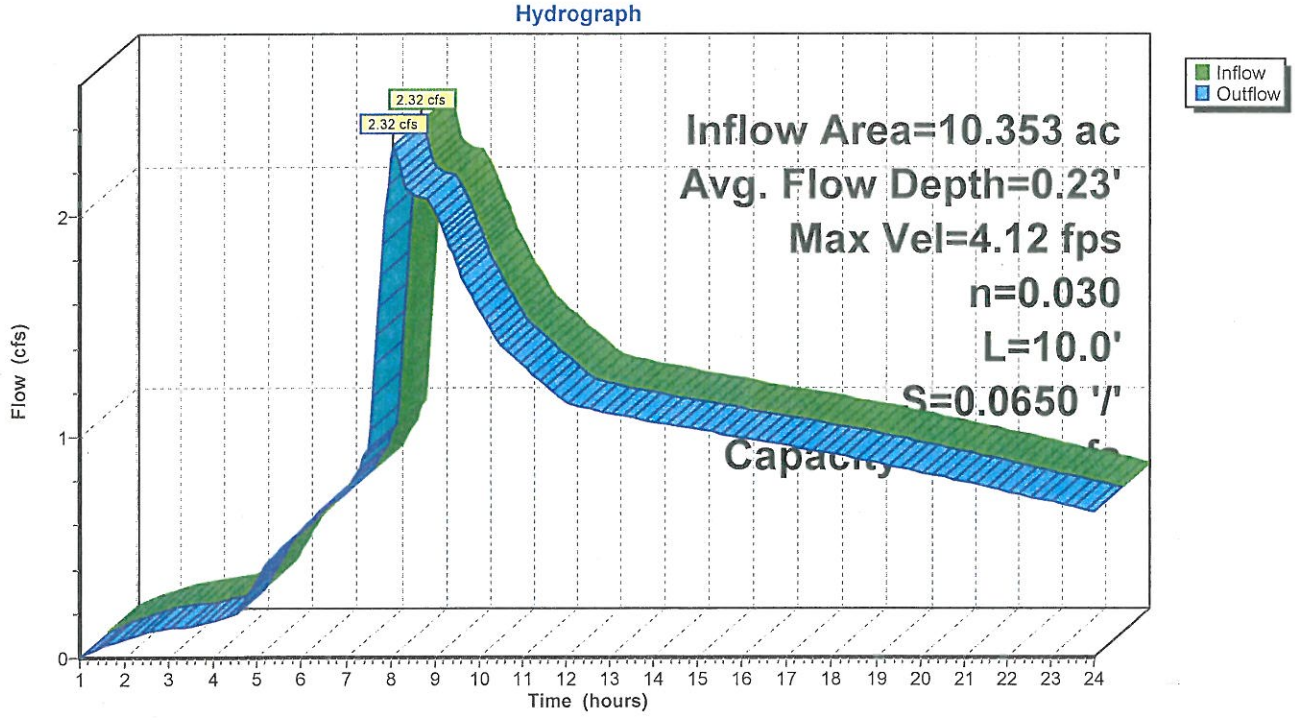
Inflow Area = 10.353 ac, 66.32% Impervious, Inflow Depth > 1.96" for 5yr event
Inflow = 2.32 cfs @ 8.07 hrs, Volume= 1.691 af
Outflow = 2.32 cfs @ 8.07 hrs, Volume= 1.691 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.12 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.84 fps, Avg. Travel Time= 0.1 min

Peak Storage= 6 cf @ 8.07 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 407.12 cfs

2.00' x 3.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 10.0' Slope= 0.0650 '/'
Inlet Invert= 470.00', Outlet Invert= 469.35'

Reach 6R: BC Road Ditch



Summary for Pond 2P: Pond 1

[82] Warning: Early inflow requires earlier time span

Inflow Area = 5.348 ac, 69.82% Impervious, Inflow Depth > 2.28" for 5yr event
Inflow = 2.66 cfs @ 8.00 hrs, Volume= 1.017 af
Outflow = 0.98 cfs @ 9.15 hrs, Volume= 0.889 af, Atten= 63%, Lag= 69.4 min
Primary = 0.98 cfs @ 9.15 hrs, Volume= 0.889 af

Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 477.35' @ 9.15 hrs Surf.Area= 0.103 ac Storage= 0.282 af

Plug-Flow detention time= 238.7 min calculated for 0.889 af (87% of inflow)
Center-of-Mass det. time= 152.1 min (850.2 - 698.1)

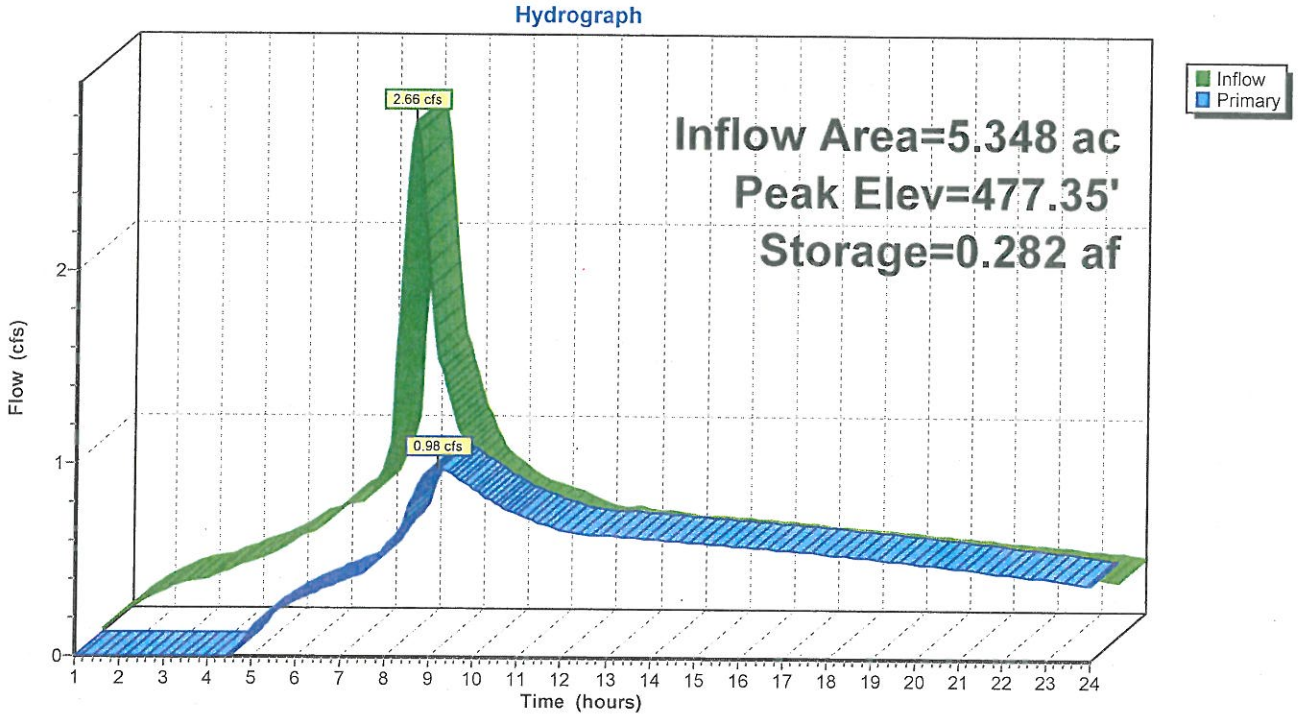
Volume	Invert	Avail.Storage	Storage Description
#1	473.00'	0.479 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
473.00	0.035	0.000	0.000
474.00	0.046	0.040	0.040
475.00	0.061	0.053	0.094
476.00	0.076	0.068	0.162
477.00	0.095	0.085	0.248
478.00	0.117	0.106	0.354
479.00	0.133	0.125	0.479

Device	Routing	Invert	Outlet Devices
#1	Primary	473.50'	**36.0" Round CMP_Round 36"** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 473.50' / 473.00' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	474.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	477.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.98 cfs @ 9.15 hrs HW=477.35' (Free Discharge)
↑**1=CMP_Round 36"** (Passes 0.98 cfs of 52.16 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.69 cfs @ 7.89 fps)
3=Orifice/Grate (Orifice Controls 0.29 cfs @ 2.01 fps)

Pond 2P: Pond 1



Summary for Pond 5P: Pond 2 - ChamberMaxx

[82] Warning: Early inflow requires earlier time span

Inflow Area = 1.832 ac, 71.62% Impervious, Inflow Depth > 2.32" for 5yr event
Inflow = 0.93 cfs @ 8.00 hrs, Volume= 0.354 af
Outflow = 0.53 cfs @ 8.49 hrs, Volume= 0.261 af, Atten= 43%, Lag= 29.3 min
Primary = 0.53 cfs @ 8.49 hrs, Volume= 0.261 af

Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 474.56' @ 8.49 hrs Surf.Area= 0.067 ac Storage= 0.112 af

Plug-Flow detention time= 306.7 min calculated for 0.260 af (74% of inflow)
Center-of-Mass det. time= 141.3 min (837.6 - 696.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	472.00'	0.085 af	**39.77'W x 73.49'L x 4.53'H Field A** 0.304 af Overall - 0.091 af Embedded = 0.213 af x 40.0% Voids
#2A	473.00'	0.091 af	**Contech ChamberMaxx** x 80 Inside #1 Effective Size= 49.6"W x 30.0"H => 6.92 sf x 7.12'L = 49.3 cf Overall Size= 51.4"W x 30.3"H x 7.58'L with 0.47' Overlap Row Length Adjustment= +0.32' x 6.92 sf x 8 rows
		0.176 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	473.00'	**12.0" Round Culvert** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 473.00' / 470.50' S= 0.0500 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	474.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.53 cfs @ 8.49 hrs HW=474.56' (Free Discharge)
↑—**1=Culvert** (Passes 0.53 cfs of 3.90 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.53 cfs @ 2.70 fps)

Pond 5P: Pond 2 - ChamberMaxx - Chamber Wizard Field A

Chamber Model = Contech ChamberMaxx
Effective Size= 49.6"W x 30.0"H => 6.92 sf x 7.12'L = 49.3 cf
Overall Size= 51.4"W x 30.3"H x 7.58'L with 0.47' Overlap
Row Length Adjustment= +0.32' x 6.92 sf x 8 rows

51.4" Wide + 6.0" Spacing = 57.4" C-C Row Spacing

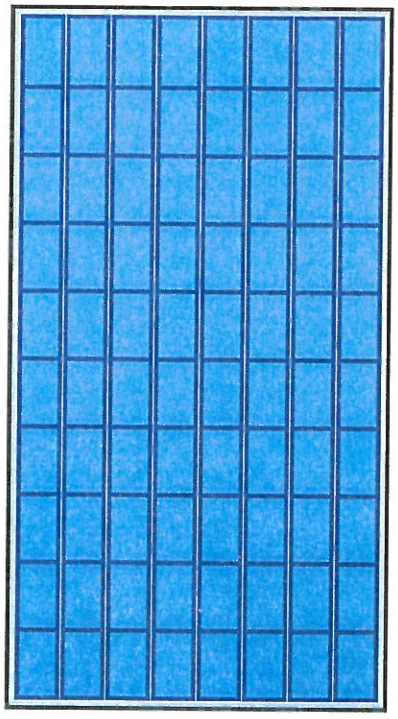
10 Chambers/Row x 7.12' Long +0.32' Row Adjustment = 71.49' Row Length +12.0" End Stone x 2 = 73.49' Base Length
8 Rows x 51.4" Wide + 6.0" Spacing x 7 + 12.0" Side Stone x 2 = 39.77' Base Width
12.0" Base + 30.3" Chamber Height + 12.0" Cover = 4.53' Field Height

80 Chambers x 49.3 cf +0.32' Row Adjustment x 6.92 sf x 8 Rows = 3,958.4 cf Chamber Storage

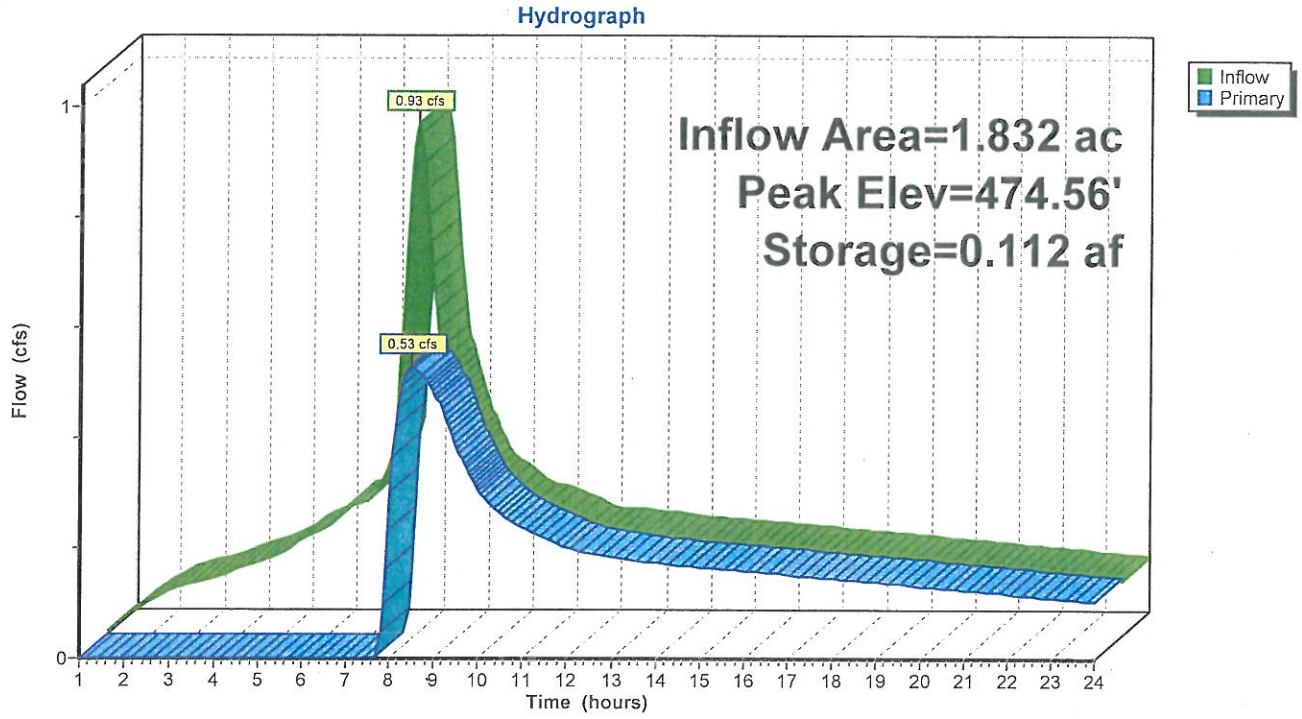
13,223.5 cf Field - 3,958.4 cf Chambers = 9,265.1 cf Stone x 40.0% Voids = 3,706.1 cf Stone Storage

Chamber Storage + Stone Storage = 7,664.4 cf = 0.176 af
Overall Storage Efficiency = 58.0%

80 Chambers
489.8 cy Field
343.2 cy Stone



Pond 5P: Pond 2 - ChamberMaxx



Time span=1.00-24.00 hrs, dt=0.05 hrs, 461 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: POST - Basin 1 Runoff Area=5.348 ac 69.82% Impervious Runoff Depth>3.09"
Flow Length=850' Tc=14.1 min CN=74/98 Runoff=3.62 cfs 1.378 af

Subcatchment 4S: POST - Basin 2 Runoff Area=1.832 ac 71.62% Impervious Runoff Depth>3.13"
Flow Length=850' Tc=14.1 min CN=74/98 Runoff=1.26 cfs 0.478 af

Subcatchment 8S: POST - Meyers/BC/C1 Runoff Area=3.173 ac 57.36% Impervious Runoff Depth>2.82"
Flow Length=850' Tc=14.1 min CN=74/98 Runoff=1.93 cfs 0.747 af

Reach 6R: BC Road Ditch Avg. Flow Depth=0.30' Max Vel=4.77 fps Inflow=3.70 cfs 2.327 af
n=0.030 L=10.0' S=0.0650 '/' Capacity=407.12 cfs Outflow=3.70 cfs 2.327 af

Pond 2P: Pond 1 Peak Elev=477.95' Storage=0.348 af Inflow=3.62 cfs 1.378 af
Outflow=1.55 cfs 1.197 af

Pond 5P: Pond 2 - ChamberMaxx Peak Elev=474.95' Storage=0.129 af Inflow=1.26 cfs 0.478 af
Outflow=0.79 cfs 0.383 af

Total Runoff Area = 10.353 ac Runoff Volume = 2.603 af Average Runoff Depth = 3.02"
33.68% Pervious = 3.487 ac 66.32% Impervious = 6.866 ac

Summary for Subcatchment 1S: POST - Basin 1

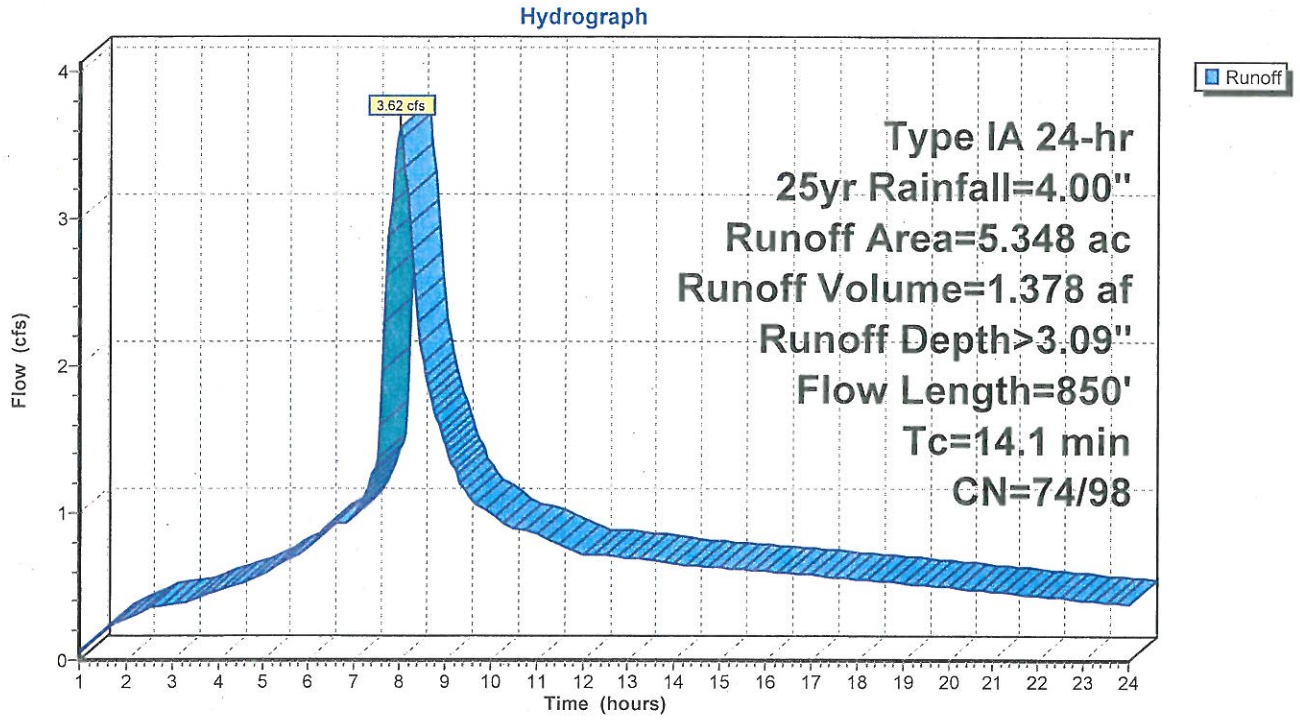
Runoff = 3.62 cfs @ 8.00 hrs, Volume= 1.378 af, Depth> 3.09"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25yr Rainfall=4.00"

Area (ac)	CN	Description
1.614	74	>75% Grass cover, Good, HSG C
0.486	98	Unconnected pavement, HSG C
2.119	98	Paved parking, HSG C
1.129	98	Roofs, HSG C
5.348	91	Weighted Average
1.614	74	30.18% Pervious Area
3.734	98	69.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 1S: POST - Basin 1



Summary for Subcatchment 4S: POST - Basin 2

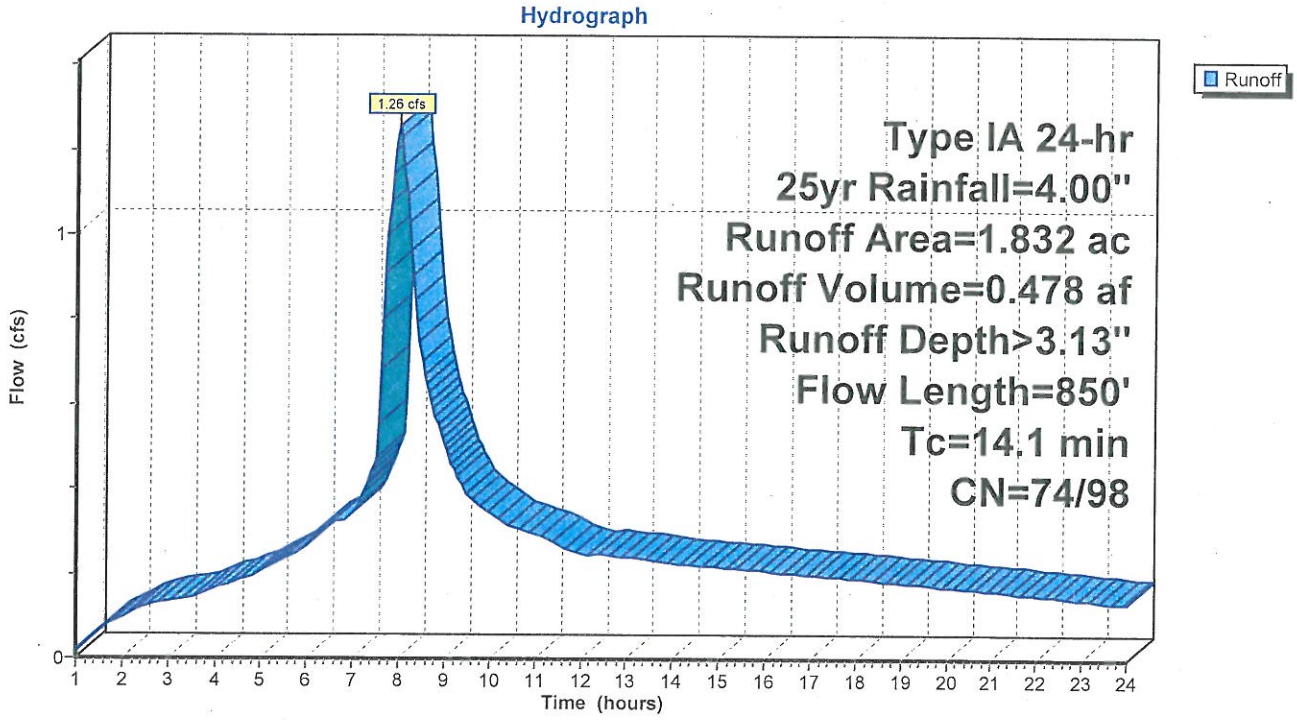
Runoff = 1.26 cfs @ 8.00 hrs, Volume= 0.478 af, Depth> 3.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25yr Rainfall=4.00"

Area (ac)	CN	Description
0.520	74	>75% Grass cover, Good, HSG C
0.086	98	Unconnected pavement, HSG C
0.620	98	Paved parking, HSG C
0.606	98	Roofs, HSG C
1.832	91	Weighted Average
0.520	74	28.38% Pervious Area
1.312	98	71.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 4S: POST - Basin 2



Summary for Subcatchment 8S: POST - Meyers/BC/C1

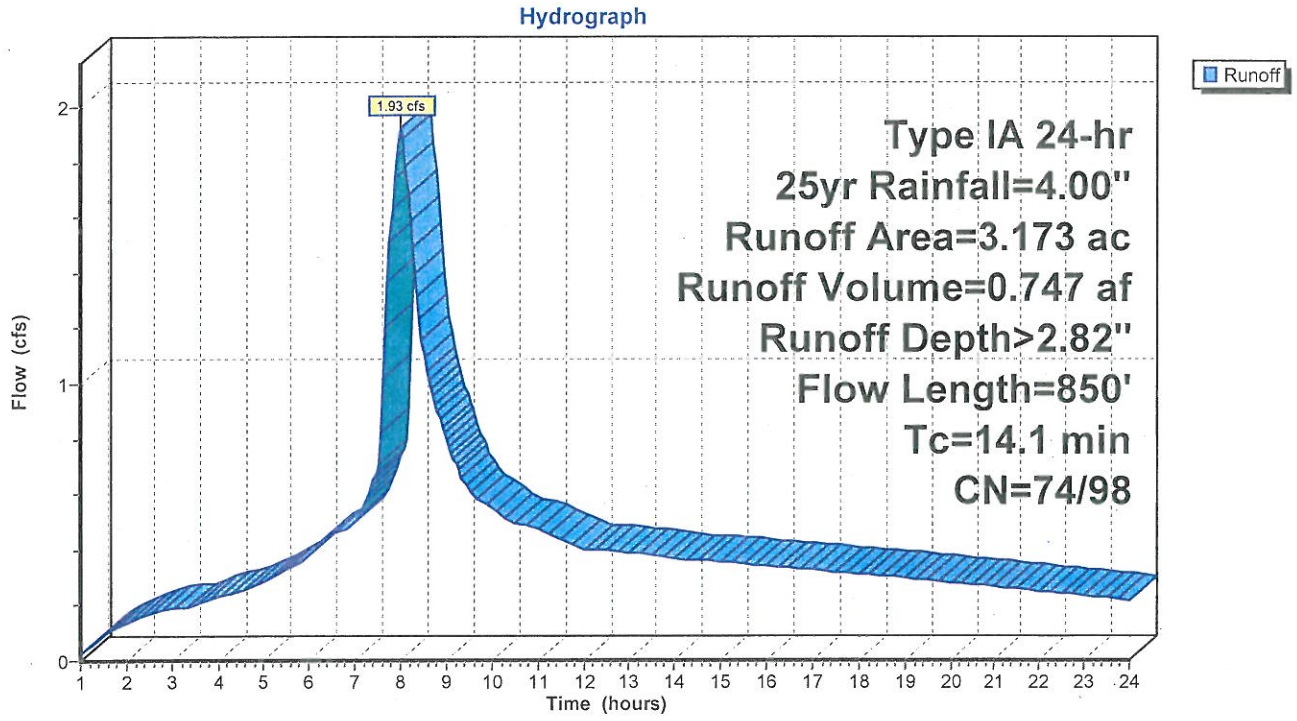
Runoff = 1.93 cfs @ 8.00 hrs, Volume= 0.747 af, Depth> 2.82"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25yr Rainfall=4.00"

Area (ac)	CN	Description
1.353	74	>75% Grass cover, Good, HSG C
0.317	98	Unconnected pavement, HSG C
1.367	98	Paved parking, HSG C
0.136	98	Roofs, HSG C
3.173	88	Weighted Average
1.353	74	42.64% Pervious Area
1.820	98	57.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0200	0.15		**Sheet Flow, Grass Area** Grass: Short n= 0.150 P2= 2.60"
2.6	250	0.0250	1.63		**Sheet Flow, Parking Lot** Smooth surfaces n= 0.011 P2= 2.60"
0.6	500	0.0600	14.45	11.35	**Pipe Channel, Storm Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
14.1	850	Total			

Subcatchment 8S: POST - Meyers/BC/C1



Summary for Reach 6R: BC Road Ditch

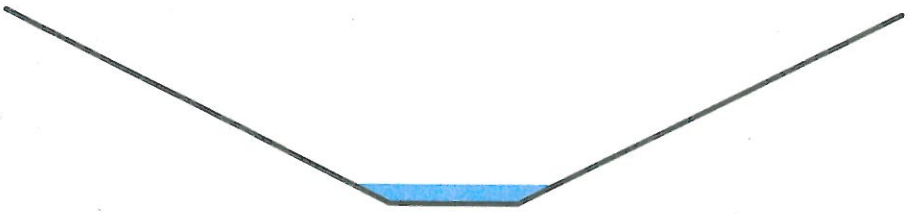
[82] Warning: Early inflow requires earlier time span
[85] Warning: Oscillations may require Finer Routing>1 (severity=2)

Inflow Area = 10.353 ac, 66.32% Impervious, Inflow Depth > 2.70" for 25yr event
Inflow = 3.70 cfs @ 8.12 hrs, Volume= 2.327 af
Outflow = 3.70 cfs @ 8.12 hrs, Volume= 2.327 af, Atten= 0%, Lag= 0.0 min

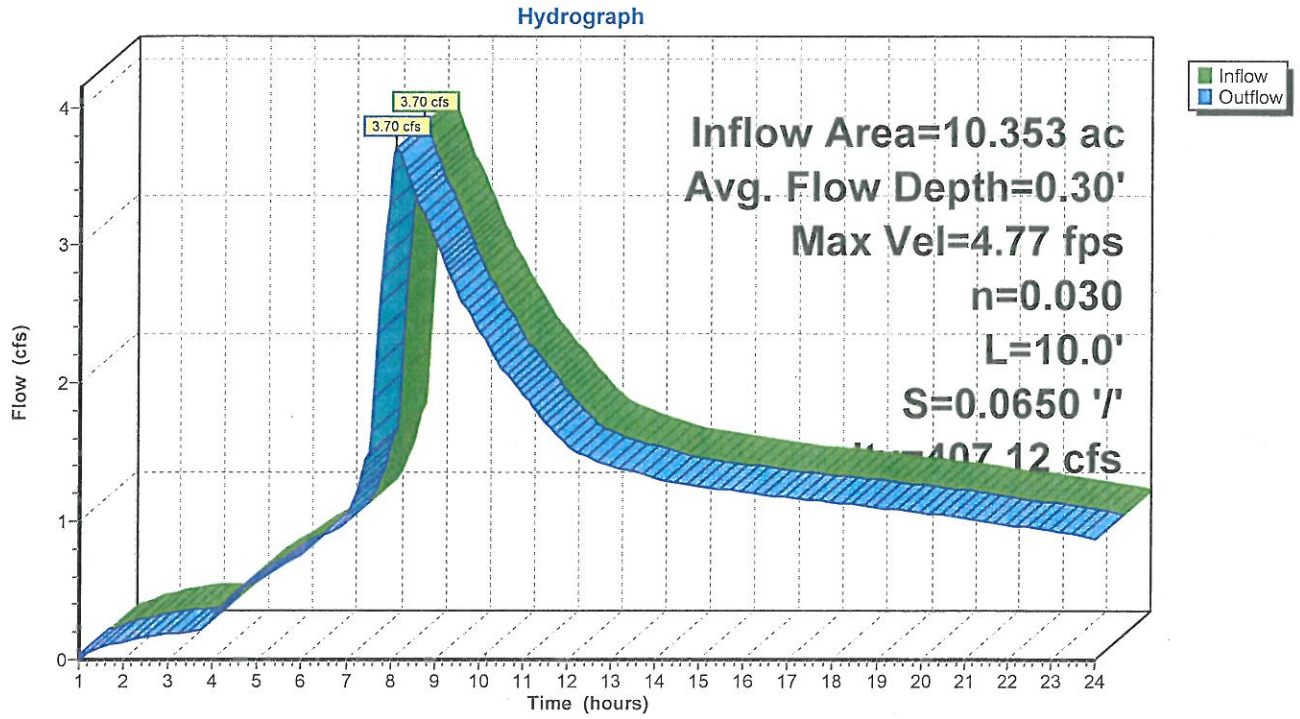
Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.77 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.16 fps, Avg. Travel Time= 0.1 min

Peak Storage= 8 cf @ 8.12 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 407.12 cfs

2.00' x 3.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 10.0' Slope= 0.0650 '/'
Inlet Invert= 470.00', Outlet Invert= 469.35'



Reach 6R: BC Road Ditch



Summary for Pond 2P: Pond 1

[82] Warning: Early inflow requires earlier time span

Inflow Area = 5.348 ac, 69.82% Impervious, Inflow Depth > 3.09" for 25yr event
Inflow = 3.62 cfs @ 8.00 hrs, Volume= 1.378 af
Outflow = 1.55 cfs @ 8.90 hrs, Volume= 1.197 af, Atten= 57%, Lag= 54.3 min
Primary = 1.55 cfs @ 8.90 hrs, Volume= 1.197 af

Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 477.95' @ 8.90 hrs Surf.Area= 0.116 ac Storage= 0.348 af

Plug-Flow detention time= 214.4 min calculated for 1.197 af (87% of inflow)
Center-of-Mass det. time= 124.4 min (817.5 - 693.2)

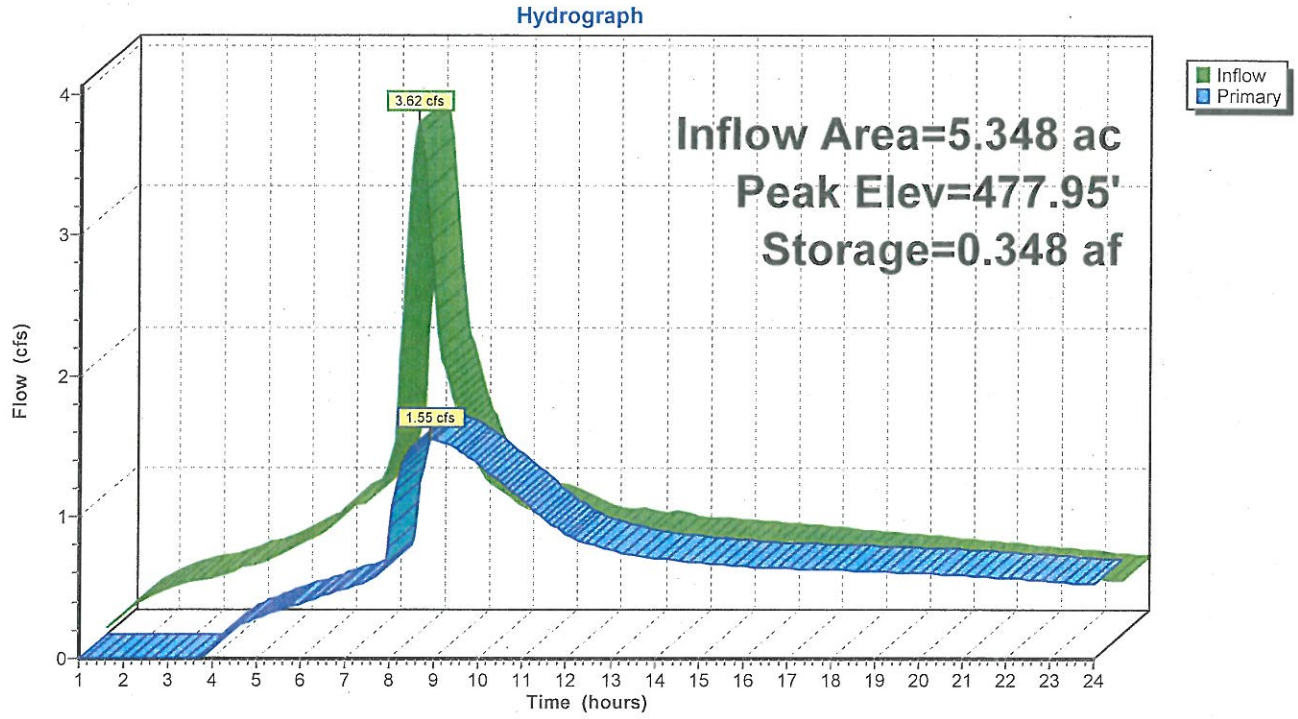
Volume	Invert	Avail.Storage	Storage Description
#1	473.00'	0.479 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
473.00	0.035	0.000	0.000
474.00	0.046	0.040	0.040
475.00	0.061	0.053	0.094
476.00	0.076	0.068	0.162
477.00	0.095	0.085	0.248
478.00	0.117	0.106	0.354
479.00	0.133	0.125	0.479

Device	Routing	Invert	Outlet Devices
#1	Primary	473.50'	**36.0" Round CMP_Round 36"** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 473.50' / 473.00' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	474.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	477.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.55 cfs @ 8.90 hrs HW=477.95' (Free Discharge)
↑└─**1=CMP_Round 36"** (Passes 1.55 cfs of 58.42 cfs potential flow)
  ↑├─**2=Orifice/Grate** (Orifice Controls 0.76 cfs @ 8.72 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.79 cfs @ 4.02 fps)

Pond 2P: Pond 1



Summary for Pond 5P: Pond 2 - ChamberMaxx

[82] Warning: Early inflow requires earlier time span

Inflow Area = 1.832 ac, 71.62% Impervious, Inflow Depth > 3.13" for 25yr event
Inflow = 1.26 cfs @ 8.00 hrs, Volume= 0.478 af
Outflow = 0.79 cfs @ 8.41 hrs, Volume= 0.383 af, Atten= 37%, Lag= 24.6 min
Primary = 0.79 cfs @ 8.41 hrs, Volume= 0.383 af

Routing by Stor-Ind method, Time Span= 1.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 474.95' @ 8.41 hrs Surf.Area= 0.067 ac Storage= 0.129 af

Plug-Flow detention time= 243.6 min calculated for 0.383 af (80% of inflow)
Center-of-Mass det. time= 113.7 min (805.0 - 691.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	472.00'	0.085 af	**39.77'W x 73.49'L x 4.53'H Field A** 0.304 af Overall - 0.091 af Embedded = 0.213 af x 40.0% Voids
#2A	473.00'	0.091 af	**Contech ChamberMaxx** x 80 Inside #1 Effective Size= 49.6"W x 30.0"H => 6.92 sf x 7.12'L = 49.3 cf Overall Size= 51.4"W x 30.3"H x 7.58'L with 0.47' Overlap Row Length Adjustment= +0.32' x 6.92 sf x 8 rows
		0.176 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	473.00'	**12.0" Round Culvert** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 473.00' / 470.50' S= 0.0500 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	474.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.79 cfs @ 8.41 hrs HW=474.95' (Free Discharge)
↑—**1=Culvert** (Passes 0.79 cfs of 4.55 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.79 cfs @ 4.02 fps)

Pond 5P: Pond 2 - ChamberMaxx - Chamber Wizard Field A

Chamber Model = Contech ChamberMaxx
Effective Size= 49.6"W x 30.0"H => 6.92 sf x 7.12'L = 49.3 cf
Overall Size= 51.4"W x 30.3"H x 7.58'L with 0.47' Overlap
Row Length Adjustment= +0.32' x 6.92 sf x 8 rows

51.4" Wide + 6.0" Spacing = 57.4" C-C Row Spacing

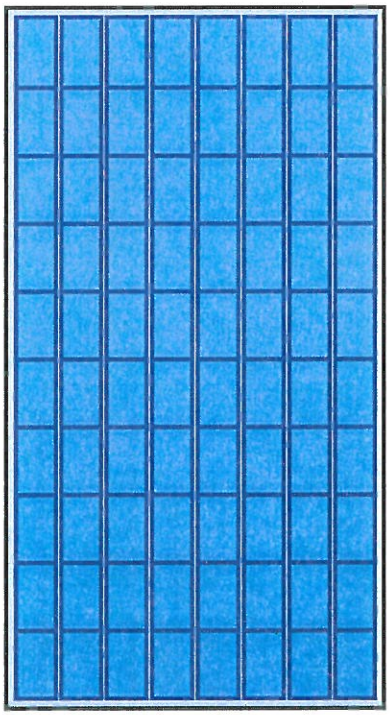
10 Chambers/Row x 7.12' Long +0.32' Row Adjustment = 71.49' Row Length +12.0" End Stone x 2 = 73.49' Base Length
8 Rows x 51.4" Wide + 6.0" Spacing x 7 + 12.0" Side Stone x 2 = 39.77' Base Width
12.0" Base + 30.3" Chamber Height + 12.0" Cover = 4.53' Field Height

80 Chambers x 49.3 cf +0.32' Row Adjustment x 6.92 sf x 8 Rows = 3,958.4 cf Chamber Storage

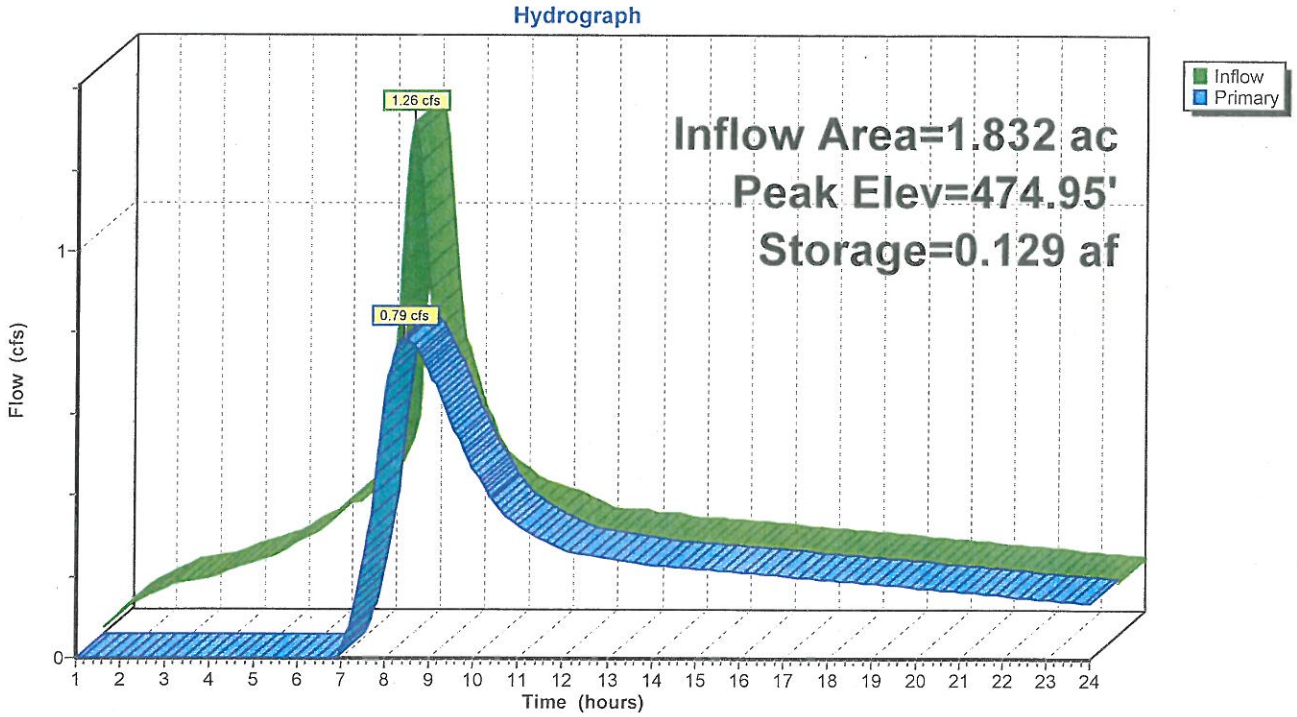
13,223.5 cf Field - 3,958.4 cf Chambers = 9,265.1 cf Stone x 40.0% Voids = 3,706.1 cf Stone Storage

Chamber Storage + Stone Storage = 7,664.4 cf = 0.176 af
Overall Storage Efficiency = 58.0%

80 Chambers
489.8 cy Field
343.2 cy Stone



Pond 5P: Pond 2 - ChamberMaxx



BEAVERCREEK ROAD
LIVE/WORK DEVELOPMENT

PRELIMINARY STORMWATER DESIGN REPORT
MAY 2014

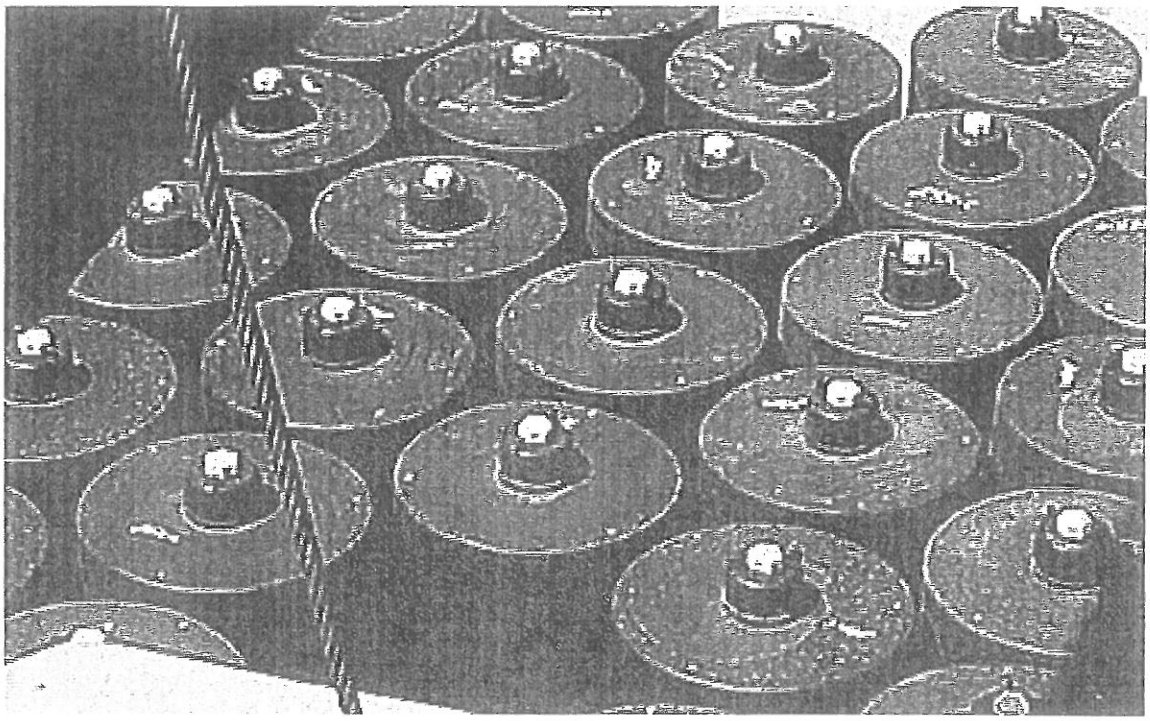
Appendix 4

Water Quality Structure Cut Sheets

CONTECH®
CONSTRUCTION PRODUCTS INC.

StormFilter

Configuration Guide



The Stormwater Management
StormFilter®

The Stormwater Management StormFilter®

The Stormwater Management StormFilter® (StormFilter) is a passive, flow-through, stormwater filtration system. The system is comprised of one or more structures that house rechargeable, media-filled cartridges which trap particulates and adsorb materials such as dissolved metals, hydrocarbons, and nutrients in polluted runoff.

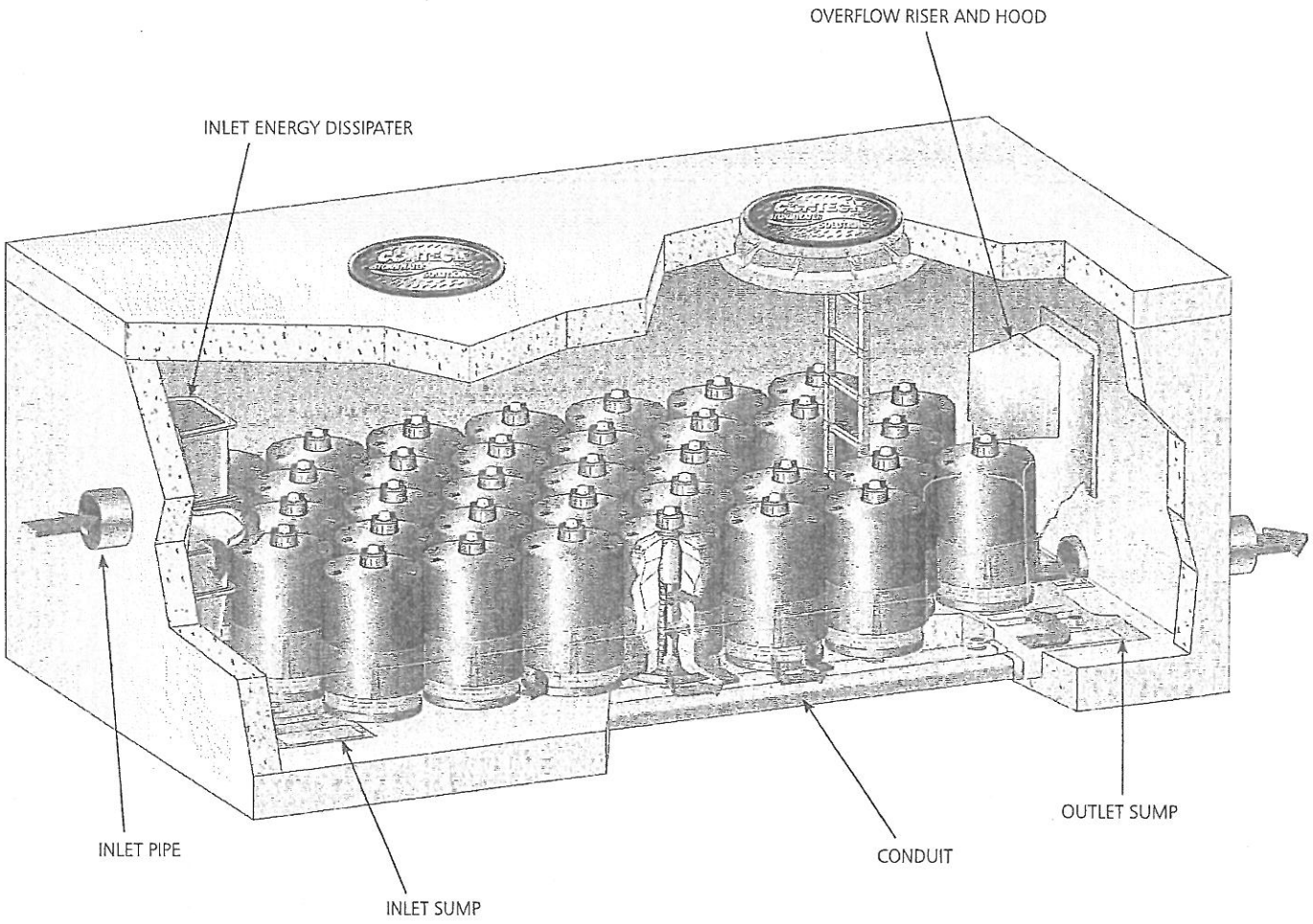
The StormFilter system comes in a variety of configurations and sizes to meet any site need. A variety of filter media is available and can be customized for each site to remove the desired pollutants.

Basic Design

The StormFilter is sized to treat the peak flow of a water quality design storm. The peak flow or WQv is determined from calculations based on the contributing watershed hydrology and from a design storm magnitude set by the local stormwater management agency. The StormFilter system is modular and each unit is designed with the number of cartridges required to meet the peak design flow rate, WQv or cap.

The flow rate through each filter cartridge is set to meet the jurisdictional performance requirements, allowing control over the amount of contact time between the influent and the filter media. The maximum flow rate through each cartridge can be adjusted, between 0.26 gpm/ft² and 2 gpm/ft² of surface area, using a calibrated restrictor disc at the base of each filter cartridge. Adjustments to the cartridge flow rate will affect the number of cartridges required to treat the peak flow or WQv.

Please contact your local CONTECH representative for site-specific design assistance.



Basic Operation

Priming System Function

The system is designed to siphon stormwater runoff through the StormFilter cartridge. Stormwater enters a StormFilter cartridge, percolates horizontally through the cartridge's filter media and collects in the center tube where the float valve is in a closed (downward) position.

As water passes through the filter media and into the cartridge's center tube, the air in the cartridge is displaced by the water and purged from beneath the filter hood through the one-way check valve located in the cap. Once the center tube is filled with water, there is enough buoyant force to open the float valve and allow the treated water in the center tube to flow into the under-drain manifold. This causes the check valve to close, initiating a siphon that draws polluted water throughout the full surface area and volume of the filter. Thus, the entire filter cartridge is used to filter water throughout the duration of the storm, regardless of the water surface elevation in the unit. This siphon continues until the water surface elevation drops to the elevation of the hood's scrubbing regulators, and the float returns to a closed position. Utilizing the hydraulic potential in the cartridge, the scrubbing regulators cause the filter surface to be clean of attached sediments thus extending the filter's operational life.

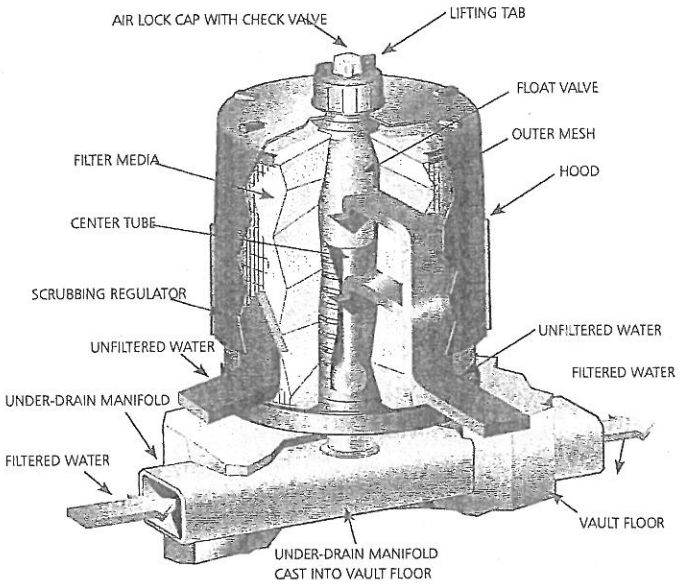
Flow and Valve Control

The filtration rate through a typical StormFilter cartridge can be adjusted so that it has a maximum flow rate of 2 gpm/ft² at the design driving head. The flow rate is individually controlled for each cartridge by a restrictor disc located at the connection point between the cartridge and the under-drain manifold. Consisting of a simple orifice disc of a specific diameter, the flow rate through the cartridges can be adjusted to a level that coincides with your treatment requirements by using a disc with the appropriate orifice diameter.

A reduction in flow rate affects the performance of the StormFilter system with regards to both sediment and soluble pollutants. For solids, Stokes' Law predicts the movement of sediment in a fluid and it has been proven that a reduction in the flow velocity through the system will facilitate increased settling and capture of sediments. In addition, some media types have the ability to remove soluble pollutants through chemical processes, like ion exchange. A reduction in the flow velocity through the StormFilter cartridge will increase the contact time between the stormwater and the media, thereby increasing the removal efficiency by increasing the time for a chemical process to take place.

Media type can be changed, but flow rate adjustment requires engineering consultation to ensure hydraulic demands are satisfied.

Through routine maintenance, a media filtration system can adjust the media type to target or update the system to treating specific pollutants, new TMDLs, or changing pollutants of concern. The media change out can provide a long-term solution to changing regulatory requirements.



StormFilter Configurations

The StormFilter technology can be configured to meet your unique site requirements.

Downstream Treatment Configurations

Conventional stormwater treatment involves collecting, conveying and treating stormwater runoff with an end of pipe treatment system before discharging off-site. StormFilter configurations suitable for these applications are listed below and can be engineered to treat a wide range of flows.

Vault/Manhole

The Vault/Manhole consists of one or more precast concrete structures ranging from 48" manholes to 8' x 24' vaults. The largest unit treats water quality design flows up to 3.75 cfs, and can be placed in series or in parallel to treat higher flows if needed.

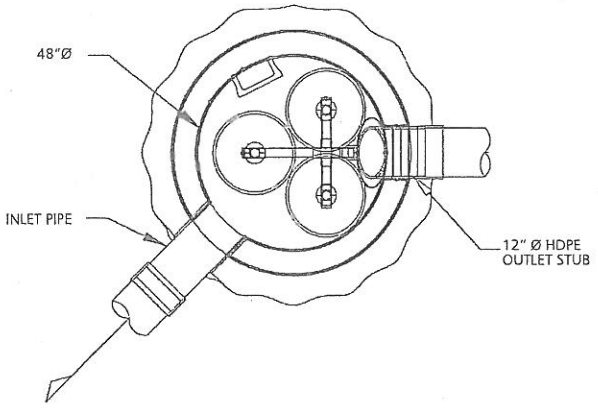
A Vault/Manhole configuration can be installed online or offline from storm system, where the unit has internal overflow bypass. These systems can also be installed offline, where high flows are bypassed around the treatment system and there is no internal overflow. However, if detention, pretreatment, or bypassing is required, it can be installed offline of the storm system.

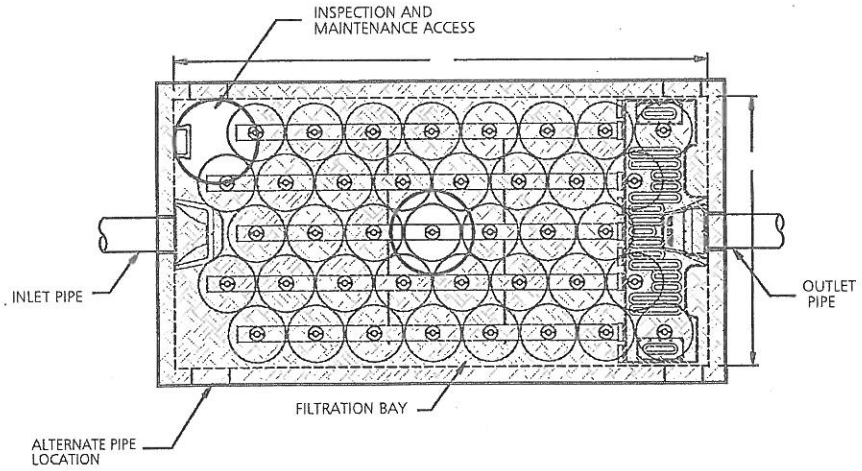
Basic Operation

Vault/Manhole systems are housed in either a vault or manhole. Stormwater first enters the structure through the inlet pipe where it is directed through the energy dissipator. This gently spreads the flow to minimize re-suspension of previously captured pollutants.

Once in the filtration area, the stormwater begins to pond and percolate horizontally through the media contained in the filter cartridges. After passing through the media, treated water that has collected in the cartridge center tube is directed into the outlet sump by an under-drain manifold. The treated water in the outlet sump is then discharged through the outlet pipe.

Precast StormFilter systems have an internal bypass capability from 1.0 cfs to 2.0 cfs, depending upon the size of the system. If peaks flows to the system exceed 2.0 cfs, an offline high flow bypass is needed.





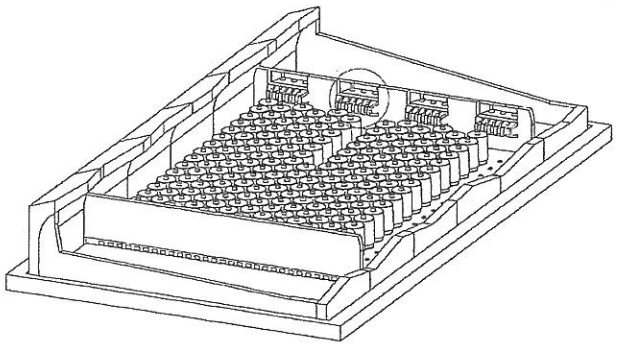
Vault/Manhole StormFilter

High Flow StormFilter

High Flow StormFilter systems can be designed within a variety of structures to meet local requirements and streamline installation. These systems are designed for large sites and large flows. Too big for standard precast structures, they are usually built from precast components that are assembled on site. The High Flow StormFilter is available in several configurations: CON/SPAN®, Panel Vaults, Box Culverts, or Cast-In-Place.

Basic Operation

The High Flow StormFilter design has the same basic configuration and components as the Precast StormFilter but operates on a larger scale.



High Flow StormFilter

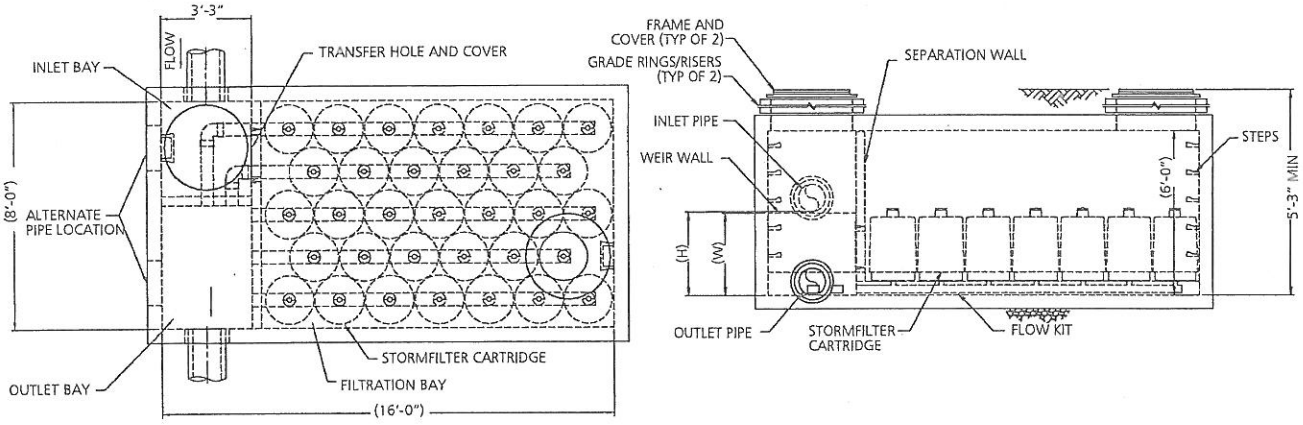
Peak Diversion StormFilter

The Peak Diversion StormFilter includes a treatment chamber and offline by-pass capability in one precast vault. Sizes range from 8'x11" to 8'x24" in most areas. Larger units can treat up to 2.5 cfs depending on cartridge height and the approved flow rate of regulatory jurisdiction. The integrated off-line bypass eliminates upstream flow splitters, downstream junction structures, and additional piping to save space and reduce the overall foot print. This lowers materials and installation cost while reducing potential conflicts with right of way (ROW) boundaries and utilities.

Basic Operation

Stormwater enters the structure through one or two inlet pipes into the inlet bay and low flows are directed to the filtration bay through a transfer opening. Once in the filtration area, the stormwater begins to pond and percolate horizontally through the media contained in the filter cartridges. After passing through the media, treated water that has collected in the cartridge center tube is directed into the outlet bay by an under-drain manifold. The treated water in the outlet sump is then discharged through the outlet pipe.

During large storm events greater than the treatment capacity, peak flows are diverted across the overflow weir directly to the outlet. Even during high flows the cartridges are still operating and water is entering the filtration bay from the inlet bay. This continuous flow into the filter bay helps ensure pollutants can not be washed out during high flow events.



Peak Diversion StormFilter

Volume StormFilter

The Volume StormFilter is designed to meet volume-based regulations where a specific water quality volume (WQv) must be captured and treated. In addition to the treatment, the structure can be sized to capture all or a portion of the WQv.

Restrictor discs inside each cartridge can be used to control the discharge rate from the system. The size of the disc is calibrated to provide the design filtration rate at a live storage depth. Because of these discs (and the airlock cap with a one way vent) water can be impounded above the cartridges in the treatment bay.

Structures range in size from a 48" manhole to CON/SPAN sections with a 24' x 10' cross section built to length. In many cases smaller structures are combined with outboard storage, such as pipe, to provide the WQv storage.

The Volume StormFilter can be designed with or without an internal bypass. If peak flows to the system exceed the internal bypass, or external bypass. If peak flows to the system exceed the internal bypass, or external bypass is required, a high flow bypass is needed. The system can also be installed online or offline and uses a traffic-bearing lid.

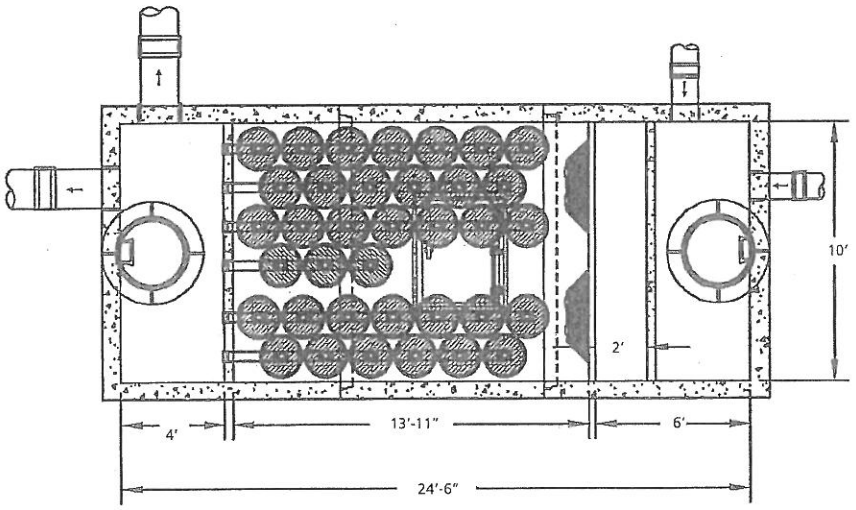
Basic Operation

The Volume StormFilter is typically configured in one of two ways.

A three bay system that incorporates internal storage for the WQv and includes: the storage bay, the filtration bay, and the outlet bay. Water first enters the storage bay (a portion of which includes dead storage) which facilitates pretreatment (gravity separation) and storage of the WQv. The stormwater is then directed into the filtration bay for full treatment and additional storage. The storage bay can be designed with a baffle to trap floatables, oils, and surface scum. Cartridges in the filtration bay treat the stormwater and control the discharge rate. Once in the filtration bay, the stormwater percolates horizontally through the media contained in the filter cartridges. After passing through the cartridge, treated water is directed to the outlet bay by an under-drain manifold where it is discharged through an outlet pipe.

A two bay, precast vault bases system similar to the Vault StormFilter where pretreatment and live storage are provided upstream.

Providing WQv storage in an outboard storage facility such as storage pipe provides the versatility to meet most footprint and elevation requirements.



Volume StormFilter

Upstream Treatment Configurations

Low Impact Design (LID) involves managing runoff close to the source using small, decentralized system. The following suite of StormFilter configurations are easily incorporated on sites where LID site design is recommended. These low-cost, lowdrop, point-of-entry systems also work well when you have a compact drainage area.

CatchBasin StormFilter

The CatchBasin StormFilter (CBSF) consists of a multi-chamber steel, concrete, or plastic catch basin unit that contains up to four StormFilter cartridges. The steel CBSF is offered both as a standard and as a deep unit.

The CBSF is installed flush with the finished grade and is applicable for small drainage areas from roadways and parking lots, and retrofit applications. It can also be fitted with an inlet pipe for roof leaders or similar applications.

The CBSF unit treats water quality design flows up to 0.20 cfs, coupled with an internal weir overflow capacity of 1.0 cfs for the standard steel and concrete units and 1.8 cfs for the deep steel units. Non-traffic rated plastic CBSF units have an internal weir overflow capacity of 0.5 cfs.

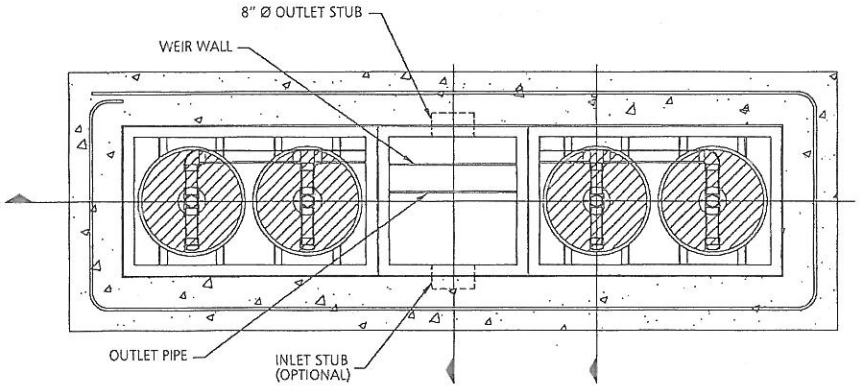
Basic Operation

The CBSF acts as the primary receiver of runoff, similar to a standard, grated catch basin. The steel and concrete CBSF units each have an H-20 rated, traffic-bearing lid that allows the filter to be installed in parking lots and take up no land area. Plastic CBSF units can be used in landscaped areas and for other non-traffic bearing applications.

The CBSF consists of a sumped inlet chamber and cartridge chamber(s). Runoff enters the sumped inlet chamber either by sheet flow from a paved surface or from an inlet pipe discharging directly to the unit. The inlet chamber's internal baffle traps debris and floating oil, and houses an overflow weir. Heavier solids settle into the deep sump, while lighter solids and soluble pollutants are directed under the baffle and into the cartridge chamber through a port between the baffle and the overflow weir. Once in the cartridge chamber, polluted water ponds and percolates horizontally through the media in the filter cartridges. Treated water collects in the cartridge's center tube from where it is directed by an under-drain manifold to the outlet pipe on the downstream side of the overflow weir and discharged.

When flows into the CBSF exceed the water quality design value, excess water spills over the overflow weir, bypassing the cartridge bay, and discharges to the outlet pipe.

The CBSF is particularly useful where small flows are being treated or for sites that are flat and have little available hydraulic head to spare. The unit is ideal for applications in which standard catch basins are to be used. Both water quality and catchment issues can be resolved with the use of the CBSF.



CatchBasin StormFilter

Curb Inlet StormFilter

The Curb Inlet StormFilter consists of a precast concrete vault ranging from 6'x8' to 8'x16' in size. These units can treat water quality design flows up to 1.2 cfs. The system is installed online and includes an internal offline overflow bypass around the filtration chamber. The internal bypass capability is based on depth of the structure. The standard bypass capacity is 15 cfs but is larger for deeper units. A traffic-bearing lid is placed underneath the median or sidewalk adjacent to the roadway.

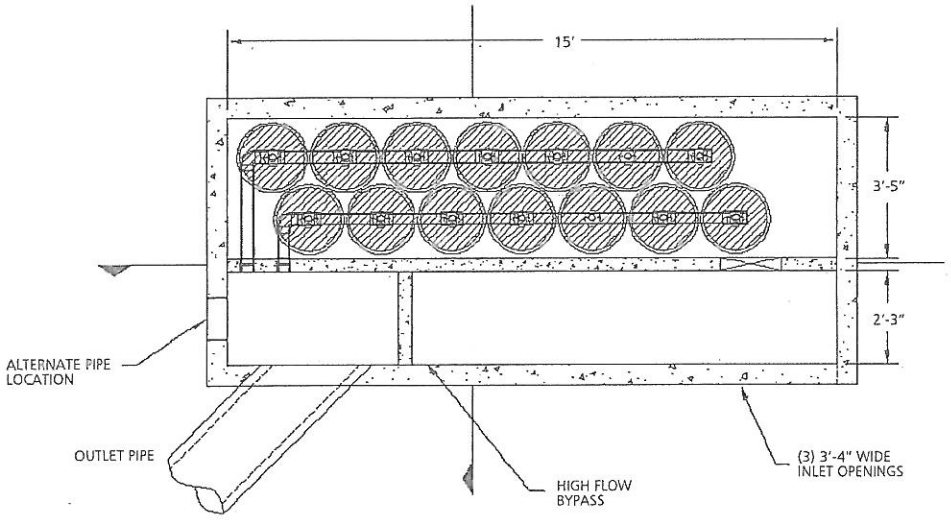
Basic Operation

The Curb Inlet StormFilter is composed of three bays: the inlet bay, the filtration bay, and the outlet bay. Stormwater enters the inlet bay through the curb inlet opening. The design flow is directed through a transfer opening to the filtration bay for full treatment.

Once in the filtration bay, the stormwater percolates horizontally through the media in the filter cartridges to the center tube. Treated water in the cartridge center tube is directed into the outlet bay by an under-drain manifold and discharged through the outlet pipe. Outlet pipes can be placed parallel, perpendicular, or up to 45° to the roadway. Overflow is directed over a weir wall between the inlet bay and the outlet bay, bypassing the filtration bay leaving accumulated pollutants undisturbed.

Curb Inlet Openings

Every Curb Inlet StormFilter is designed to meet local regulations governing the geometry of the curb inlet. This can be accomplished in two ways. One way is with an integrated face plate – the vault lid includes the face plate which is tied into the curb. Another way is with a cast-in-place face plate – the entire face plate is constructed by the contractor pouring the curb. Curb inlet openings can be 4', 7', or 10' in length.



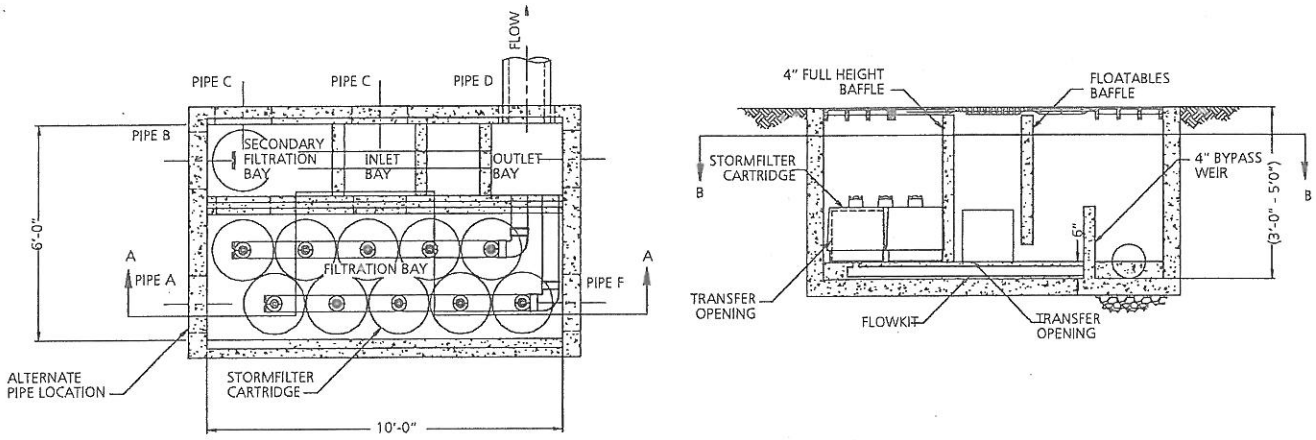
Curb Inlet StormFilter

Linear Grate StormFilter

The Linear Grate StormFilter is a precast vault that acts as the primary receiver of runoff, similar to a standard grated catch basin. The unit has H-20 rated traffic bearing lids that allow the filter to be installed under parking lots. The system consists of an inlet bay, filtration bay, and an outlet bay. Providing treatment as it enters the conveyance system reduces the overall head loss because the vertical drop from the finished grade into the conveyance system is also used to provide hydraulic pressure on the filter cartridges.

Basic Operation

Runoff enters the inlet bay by sheet flow from a paved surface or from an inlet pipe discharging directly to the unit. The inlet bay's internal baffle traps debris and floating oil and denser pollutants are directed into the filtration bay. Once in the cartridge chamber, polluted water ponds and percolates through a radial media filter cartridge. Treated water collects in the cartridge's center tube where it is directed by an underdrain manifold to the outlet pipe on the downstream side of the overflow weir. When flow rates exceed the water quality design value, excess water spills across the overflow weir, bypassing the cartridge bay and proceed directly to the outlet pipe. The integrated offline bypass ensures pollutants captured in the filtration bay are not washed downstream during peak flow events.



Linear Grate StormFilter

Grated Inlet Openings

The number of inlet grates and the size of the inlet bay are designed to capture the peak flow rates from the drainage area. The remaining area is devoted to the filtration bay and the outlet bay which are covered with removable plates for access during maintenance. The entire inlet bay, filtration bay, and outlet bay can be opened at one time allowing full access. In many cases, due to the shallow nature of the design, confined space entry is not required for maintenance.

Linear StormFilter

The Linear StormFilter consists of one or two precast concrete channels that are 10' or 20' in length and 2' 9" in width.

The Linear StormFilter is installed flush with the finished grade, functioning similar to a catch basin or trench drain. The top of the unit has either covers or doors for easy access. The Linear StormFilter is typically installed online like the precast StormFilter.

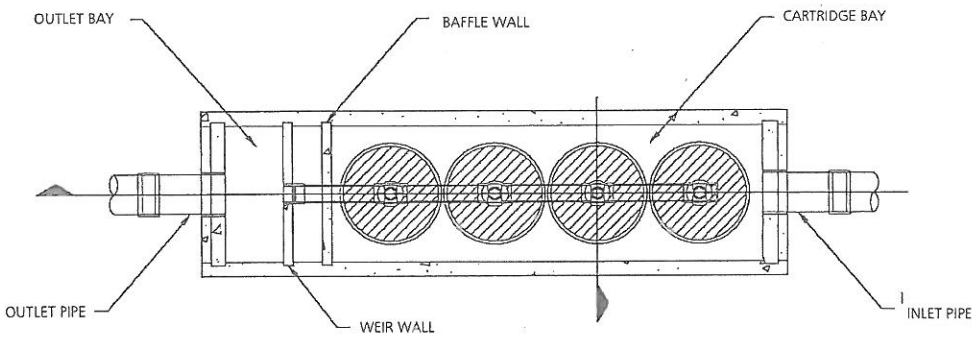
The Linear StormFilter unit treats water quality design flows up to 0.27 cfs.

Basic Operation

The Linear StormFilter can be installed either as the primary receiver of runoff, similar to a grated catch basin, or with an inlet stub and doors to receive runoff collected upstream.

The system is equipped with an internal overflow weir to ensure that there is no local flooding for storm events in excess of the design treatment flow. Maintenance costs for the unit are typically less because there are no confined space entry requirements, and access is quick and easy.

The Linear StormFilter is particularly useful where small flows are being treated or where the site is very flat and there is little available hydraulic head to spare.



Linear StormFilter

Infiltration Configuration

Dry Well StormFilter

The Dry Well StormFilter provides treatment, infiltration and groundwater protection in a single structure. The system is designed to treat conveyed flow or sheet flow from small drainages. Multiple units can be installed to treat any size site. Because it provides treatment and infiltration in a single unit, the total number of structures and the amount of pipe required for the stormwater system are reduced.

The Dry Well StormFilter system is available in 48", 60" and 72-" pre-cast manhole top sections that are designed to be stacked on top of dry well infiltration risers. The StormFilter portion of the unit arrives fully assembled and ready to install, including an integrated concrete deck for the StormFilter cartridges. The system can also be retrofitted into existing 48" manhole dry wells.

Basic Operation

Stormwater enters the dry well unit through one or more entry pipes or channels at its top. It then percolates through the media in the StormFilter cartridge to the center tube. Treated water in the cartridge center tube is discharged to the infiltration section below, and then infiltrates into the surrounding soils through a number of small exit openings at the sides and bottom.

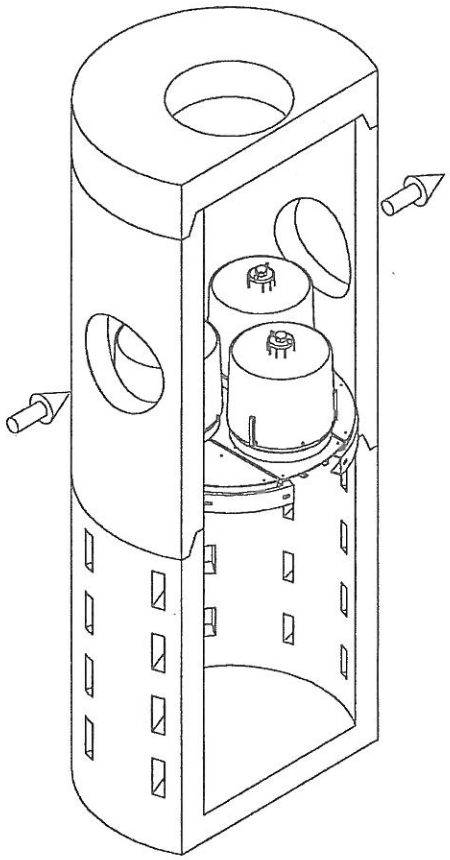
Roof Runoff Treatment Configuration

Downspout StormFilter

The Downspout StormFilter is an aboveground configuration that can be easily integrated into existing gutter systems to eliminate pollution from rooftop runoff. It typically occupies 2.5' x 5' footprint, and can fit most downspout configurations and sizes. Each unit holds two StormFilter cartridges, and single- and dual-stage options are available. It treats up to 14,000 square feet of rooftop area per dual-cartridge system.

StormFilter Cartridges

There are three cartridge heights available for StormFilter systems: 27", 18", and Low Drop. The most economical is the 27" tall cartridge. It can treat the highest flow rate per cartridge, which creates the smallest system with the lowest installed cost. The 27" cartridge requires 3.05' of driving head to operate. For sites with less driving head available, the 18" cartridge is the next best option. Lower flow rates per cartridge increase the footprint of the overall system but only 2.3' of driving head is required. For sites with very limited drop, the Low Drop cartridge only requires 1.8" of driving head.



DryWell StormFilter

Cartridge Flow Rates

Cartridge Type	Hydraulic Drop	Treatment Capacity (gpm)	
		1 gpm/ft2	2 gpm/ft2
StormFilter 27"	3.05'	11.25	22.5
StormFilter 18"	2.30'	7.5	15
StormFilter Low Drop	1.80'	5	10

StormFilter Media

The removal of site-specific pollutants can be maximized with the variety of filtration media available. In many cases, different media types can be combined so as to target a wide spectrum of pollutants. This ability to combine and use various media types allows the system to be easily adjusted to meet ever-changing site conditions and increasingly stringent regulatory requirements.

PhosphoSorb™

PhosphoSorb, a lightweight media comprised of Perlite (a heat-expanded volcanic rock) and activated alumina, removes total phosphorus (TP) by absorbing dissolved-P and filtering particulate-P simultaneously. The Perlite provides the capability to remove suspended solids while the activated alumina absorbs soluble phosphorus absorption.

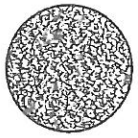
PhosphoSorb is composed of a slightly finer gradation than the field proven ZPG™ (Zeolite, Perlite, Granular Activated Carbon) media and will provide equivalent - or even better - removal of suspended solids. Initial field tests have indicated an increase in the TSS removal efficiency up to 10% over the field-proven ZPG media. The StormFilter with ZPG media has already received a General Use Level Designation for basic treatment in the State of Washington.

Perlite

Perlite is a natural, volcanic ash, similar in composition to glass and similar in appearance to pumice. To use perlite as a filter medium, it must first go through a heating process to yield a lightweight, multicellular, expanded form. This expanded form has a coarse texture, very low-density, high surface area, and stable, inert chemistry, all of which make perlite an excellent physical filtration medium.

Perlite has proven to be our media of choice for sediment and oil removal. The multicellular nature of expanded perlite is the key to its excellent ability to trap sediments and adsorb oil. The coarse texture of the expanded perlite creates a bed of material with a very high porosity, which allows perlite to have the highest sediment and oil storage capacity of all of the available media options.

Zeolite

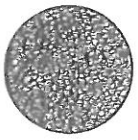


The term zeolite defines a family of both natural and synthetic, hydrous aluminosilicate materials with a highly porous mineral matrix that holds light, alkali metal cations (ideally sodium ions).

Zeolite has the ability to use a cation exchange reaction that removes other cations such as zinc, copper, lead, and ammonia from water. In the cation exchange reaction, the light metal cations in the zeolite matrix are displaced by the heavier metal cations, such as copper, in the water.

The zeolite used in our system is clinoptilolite, which has a cation exchange capacity (CEC) of approximately 100 to 220 meq/100 g. Clinoptilolite has inert characteristics that make it an excellent metals removal media option when CSF media cannot be used. It can be combined with other media such as GAC and perlite when metals are not of exclusive concern.

CSF® Leaf Media



CSF Leaf Media is a patented filtration media composed of composted deciduous leaves originating from the City of Portland, Oregon. CONTECH Stormwater Solutions purchases the mature, stable, deciduous leaf compost and then processes it into an odorless, pelletized compost product with physical and chemical characteristics desirable for stormwater filtration.

The patented compost process creates a material with excellent flow-through characteristics and stability in water. Not only do CSF Leaf Media consist of 100% recycled, all natural materials, but it also provides good removal of sediments and excellent removal of a wide range of toxic contaminants.

CSF Leaf Media provides the multitude of beneficial water treatment properties typical of soil in a form that is compatible with the compact, modular, media-based design of the StormFilter system. In addition to the physical filtration provided by the granular nature of the CSF Leaf Media, the complex chemistry of the compost also provides chemical filtration as well.

Sediment and total nutrients are removed through physical filtration. Oil, complexed metals, and anthropogenic organic contaminants such as herbicides and pesticides are removed through adsorption, the physical partitioning of organic compounds, such as pesticides, to carbon-rich materials, such as the compost.

Soluble metals are removed by cation exchange, as well as by complexation of metal ions to the organic chelating agents present in compost. CSF Leaf Media is an excellent, cost-effective, all-purpose media that epitomizes the potential value of recycled materials.

GAC

GAC (Granular Activated Carbon) is a widely accepted water filtration media used for the removal of organic compounds. It consists of pure carbon (originating from coal or charcoal) whose micro-porous structure has been enhanced through steam or acid "activation."

The high carbon content and porous nature of GAC accounts for its excellent ability to remove organic compounds through adsorption. Since adsorption is the physical partitioning of organic compounds to high carbon surfaces, the "activation" of the carbon (which creates GAC) endows it with an enormous surface area upon which adsorption can take place.

In situations where anthropogenic organic contaminants are of exclusive concern, GAC media provide the highest level of stormwater treatment compared to other available media options. However, because it is not very often the case that anthropogenic organic contaminants are of exclusive concern, GAC is usually combined with another media such as perlite or zeolite for the treatment of additional contaminants.

Combination of GAC with perlite constitutes the most cost-effective configuration, as the effectiveness of GAC is drastically reduced if it is coated with high concentrations of heavy oil or sediment, which can restrict access via surface pores to the interior of the GAC granules.

ZPG™ (Zeolite, Perlite, GAC blend)

This proprietary blend of zeolite, perlite, and granular activated carbon media is used to provide an alternative for CSF media for installations where leaf media cannot be used.

Laboratory and Field Testing

The StormFilter system is designed to meet the most stringent regulatory requirements. The field-proven performance of the StormFilter has led to hundreds of regulatory agency approvals nationwide as a standalone BMP.

The Stormwater Management StormFilter® is the first manufactured BMP to receive stand-alone approval through field testing and satisfying the total suspended solids treatment requirements in Washington and New Jersey.

Log on to www.contechstormwater.com/stormfilter to view the following reports in full.

Field Monitoring Reports

Field Proven Performance of the StormFilter using the Technology Assessment Protocol - Ecology (TAPE) and Technology Acceptance Reciprocity Partnership (TARP) Tier II Protocol

1. Washington
   a. Washington State Department of Ecology General Use Level Designation for Basic Treatment
   b. Technical Evaluator Engineering Report (TEER). Gary Minton, Ph.D., P.E.
2. New Jersey
   a. New Jersey State Department of Environmental Protection Final Certification
   b. New Jersey Corporation for Advanced Technology (NJCAT) Field Verification Report

Laboratory Reports

Total Suspended Solids (TSS) Removal Using Different Particle Size Distributions with the Stormwater Management StormFilter.

Influences on TSS removal efficiency
Influence of analytical method, data summarization method, and particle size on total suspended solids (TSS) removal efficiency of the StormFilter

StormFilter removal efficiency with coarse/fine perlite media
Evaluation of the removal of silt loam TSS using coarse/fine perlite at 28 L/min (7.5 gpm).

StormFilter removal efficiency with ZPG media
Evaluation of the removal of SIL-CO-SIL 106 using ZPG media at 28 L/min (7.5 gpm)

StormFilter removal efficiency with coarse perlite
Evaluation of the removal of sandy loam TSS using coarse perlite at 57 L/min (15 gpm)

Support

- Drawings and specifications are available at contechstormwater.com.
- Site-specific design support is available from CONTECH Stormwater Design Engineers.

CONTECH CONSTRUCTION PRODUCTS INC.

RECYCLED PAPER

BEAVERCREEK ROAD
LIVE/WORK DEVELOPMENT

PRELIMINARY STORMWATER DESIGN REPORT
MAY 2014

Appendix 5

Sample Maintenance Agreement

After recording return to:

_____
_____
_____
_____

MAINTENANCE COVENANT AND ACCESS EASEMENT

THIS MAINTENANCE COVENANT AND ACCESS EASEMENT ("Agreement") is made this ____ day of _____, 1999, between _____, a _____ ("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 _____ (the "Development").

B. The City's Community Development Department ("CDD") has approved construction plans submitted by Developer for the Development. The Development contains on-site stormwater facilities as described in the approved construction plans (together with any other stormwater facilities that may hereafter be constructed on the Development, the "Stormwater Facilities").

C. To protect future lot owners in the Development, owners of neighboring property, and their property, CDD has required that Developer enter into this Agreement as a condition to CDD's approval of construction plans and the final plat for the Development.

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 CDD or the City and including the City's Stormwater and Grading Design Standards). Developer shall notify CDD 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.

2. **Failure to Perform Covenant; Easement.** If the City determines that Developer is not in compliance with the covenant described in Section 1, except in the case of emergency, the City or its designee shall give the Developer Designee 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, Developer hereby grants to the City, CDD, their employees, independent contractors and designees the right to enter the Development to perform any and all work required to bring the Stormwater Facilities into compliance with Section 1.

If the City determines that Developer is not in compliance with the covenant in Section 1 and determines that there exists or will likely exist an emergency on or about the Development with respect to the Stormwater Facilities, Developer hereby grants to the City, CDD, their employees, independent contractors and designees the right to enter the Development to perform any and all work required to bring the Stormwater Facilities into compliance with Section 1, and in such case the City shall use reasonable efforts to notify the Developer Designee prior to entering the Development. Notwithstanding the above, the work performed may consist only of cleaning and repairing the Stormwater Facilities to their original condition and standards.

Developer hereby grants the City, CDD, their employees, independent contractors and designees a nonexclusive easement for ingress and egress over, across and under the Development for the purposes described above in this Section 2 and from time to time at the City's sole discretion to inspect, sample, and monitor components of the Stormwater Facilities and discharges therefrom.

DEVELOPER, FOR ITSELF AND ITS SUCCESSORS AND ASSIGNS (INCLUDING ALL OWNERS OF LOTS IN THE DEVELOPMENT), AGREES THAT NONE OF THE CITY, CDD, THEIR EMPLOYEES, INDEPENDENT CONTRACTORS AND/OR DESIGNEES SHALL HAVE ANY OBLIGATION TO EXERCISE THEIR RIGHTS UNDER THIS SECTION 2 OR TO PERFORM ANY MAINTENANCE OR REPAIR OF THE STORMWATER FACILITIES, AND THAT NONE OF THEM 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.

3. **Reimbursement**. If the City exercises its right to enter the Development pursuant to Section 2 (to include inspection, sampling, and monitoring), 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 a per annum rate equal to the prime rate of U.S. Bank (or its successor) plus five percent (5%). 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 this Section 3.

4. **Indemnification**. Developer agrees to indemnify, defend (with legal counsel reasonably acceptable to the City), and hold harmless the City, CDD, their 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, CDD, or their employees, independent contractors or designees of their rights under Section 2.

5. **Run with the Land**. The parties' rights and obligations contained herein shall run with the land and inure to the benefit of, and shall be binding upon, the City and Developer and their respective successors and assigns (including, without limitation, subsequent owners of lots in the Development and any homeowner's association owning common areas in the Development).

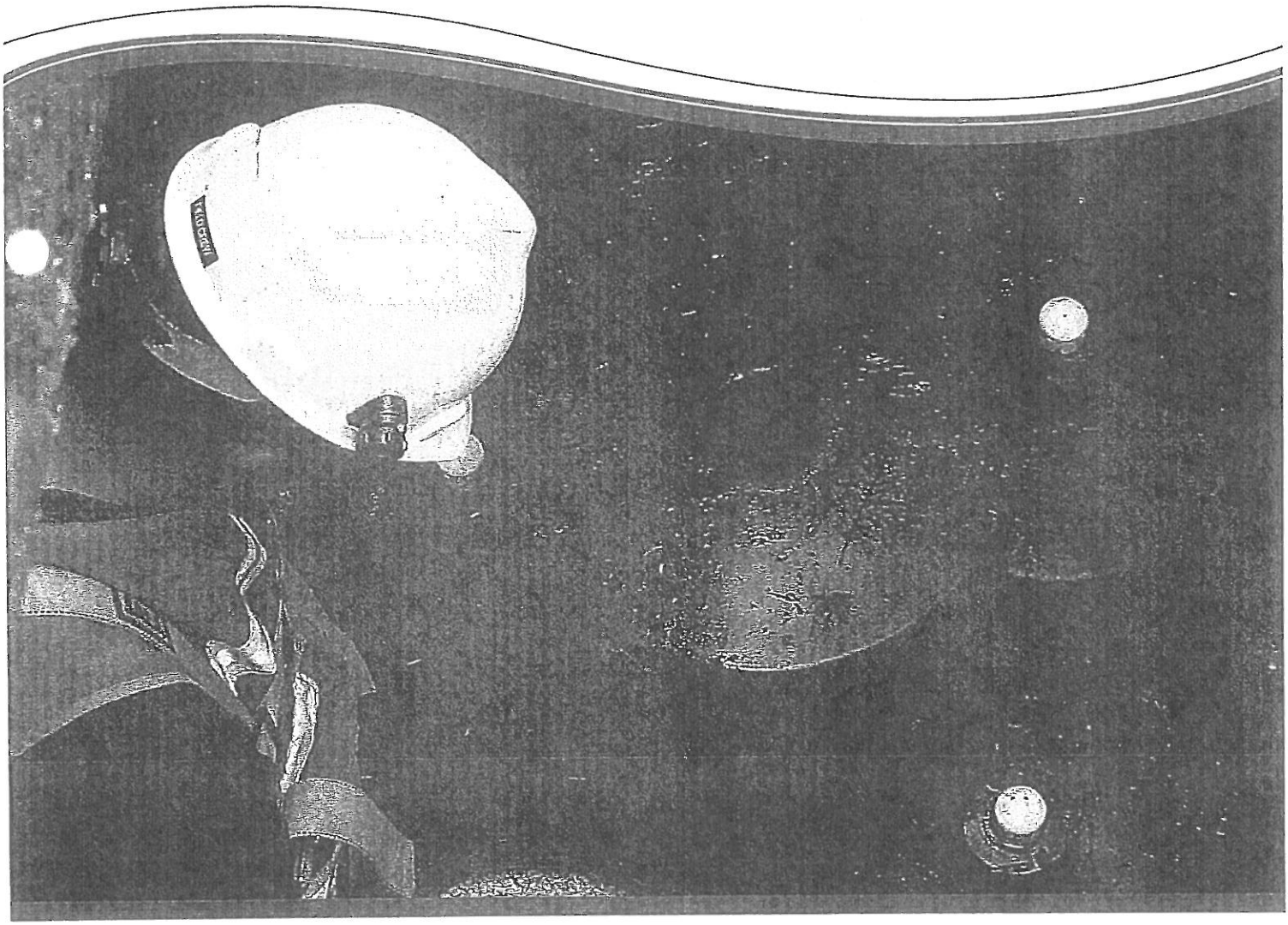
STATE OF OREGON)
) ss.
County of Clackamas)

This instrument was acknowledged before me on _____ by _____.

_____
Notary Public for _____
My Commission Expires _____

CONTECH
CONSTRUCTION PRODUCTS INC.

StormFilter Inspection and Maintenance Procedures



The Stormwater Management StormFilter®

Maintenance Guidelines

The primary purpose of the Stormwater Management StormFilter® is to filter out and prevent pollutants from entering our waterways. Like any effective filtration system, periodically these pollutants must be removed to restore the StormFilter to its full efficiency and effectiveness.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. Maintenance activities may be required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms. It is a good practice to inspect the system after major storm events.

Maintenance Procedures

Although there are likely many effective maintenance options, we believe the following procedure is efficient and can be implemented using common equipment and existing maintenance protocols. A two step procedure is recommended as follows:

1. Inspection

Inspection of the vault interior to determine the need for maintenance.

2. Maintenance

Cartridge replacement

Sediment removal

Inspection and Maintenance Timing

At least one scheduled inspection should take place per year with maintenance following as warranted.

First, an inspection should be done before the winter season. During the inspection the need for maintenance should be determined and, if disposal during maintenance will be required, samples of the accumulated sediments and media should be obtained.

Second, if warranted, a maintenance (replacement of the filter cartridges and removal of accumulated sediments) should be performed during periods of dry weather.

In addition to these two activities, it is important to check the condition of the StormFilter unit after major storms for potential damage caused by high flows and for high sediment accumulation that may be caused by localized erosion in the drainage area. It may be necessary to adjust the inspection/ maintenance schedule depending on the actual operating conditions encountered by the system. In general, inspection activities can be conducted at any time, and maintenance should occur, if warranted, in late summer to early fall when flows into the system are not likely to be present.

Maintenance Frequency

The primary factor controlling timing of maintenance of the StormFilter is sediment loading.

A properly functioning system will remove solids from water by trapping particulates in the porous structure of the filter media inside the cartridges. The flow through the system will naturally decrease as more and more particulates are trapped. Eventually the flow through the cartridges will be low enough to require replacement. It may be possible to extend the usable span of the cartridges by removing sediment from upstream trapping devices on a routine as-needed basis in order to prevent material from being re-suspended and discharged to the StormFilter treatment system.

Site conditions greatly influence maintenance requirements. StormFilter units located in areas with erosion or active construction may need to be inspected and maintained more often than those with fully stabilized surface conditions.

The maintenance frequency may be adjusted as additional monitoring information becomes available during the inspection program. Areas that develop known problems should be inspected more frequently than areas that demonstrate no problems, particularly after major storms. Ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual StormFilter system or site. It is recommended that the site owner develop a database to properly manage StormFilter inspection and maintenance programs.

Prior to the development of the maintenance database, the following maintenance frequencies should be followed:

Inspection

One time per year

After major storms

Maintenance

As needed, based on results of inspection (The average maintenance lifecycle is approximately 1-3 years)

Per Regulatory requirement

In the event of a chemical spill

Frequencies should be updated as required. The recommended initial frequency for inspection is one time per year. StormFilter units should be inspected after major storms.

Sediment removal and cartridge replacement on an as needed basis is recommended unless site conditions warrant.

Once an understanding of site characteristics has been established, maintenance may not be needed for one to three years, but inspection is warranted and recommended annually.

Inspection Procedures

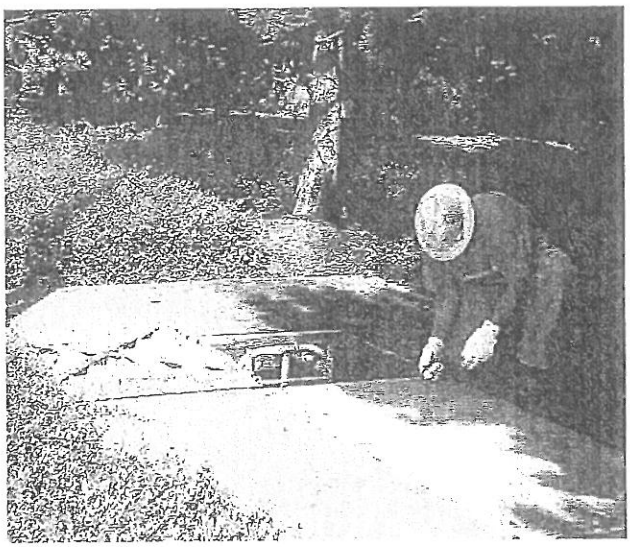
The primary goal of an inspection is to assess the condition of the cartridges relative to the level of visual sediment loading as it relates to decreased treatment capacity. It may be desirable to conduct this inspection during a storm to observe the relative flow through the filter cartridges. If the submerged cartridges are severely plugged, then typically large amounts of sediments will be present and very little flow will be discharged from the drainage pipes. If this is the case, then maintenance is warranted and the cartridges need to be replaced.

Warning: In the case of a spill, the worker should abort inspection activities until the proper guidance is obtained. Notify the local hazard control agency and CONTECH Construction Products immediately.

To conduct an inspection:

Important: Inspection should be performed by a person who is familiar with the operation and configuration of the StormFilter treatment unit.

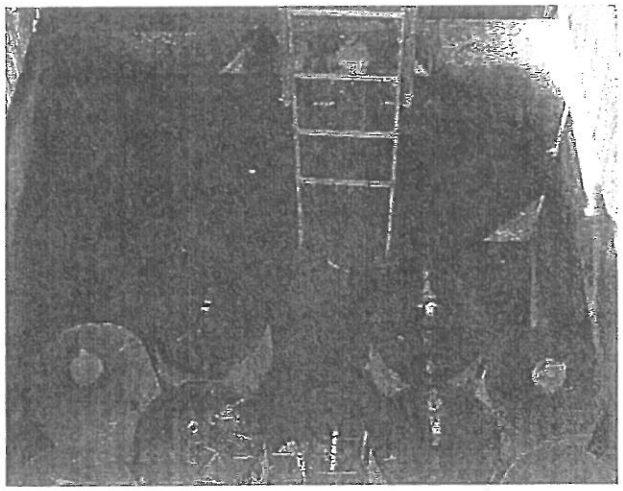
1. If applicable, set up safety equipment to protect and notify surrounding vehicle and pedestrian traffic.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.



3. Open the access portals to the vault and allow the system vent.
4. Without entering the vault, visually inspect the inside of the unit, and note accumulations of liquids and solids.
5. Be sure to record the level of sediment build-up on the floor of the vault, in the forebay, and on top of the cartridges. If flow is occurring, note the flow of water per drainage pipe. Record all observations. Digital pictures are valuable for historical documentation.
6. Close and fasten the access portals.
7. Remove safety equipment.
8. If appropriate, make notes about the local drainage area relative to ongoing construction, erosion problems, or high loading of other materials to the system.
9. Discuss conditions that suggest maintenance and make decision as to weather or not maintenance is needed.

Maintenance Decision Tree

The need for maintenance is typically based on results of the inspection. The following Maintenance Decision Tree should be used as a general guide. (Other factors, such as Regulatory Requirements, may need to be considered)



1. Sediment loading on the vault floor.
   a. If >4" of accumulated sediment, maintenance is required.
2. Sediment loading on top of the cartridge.
   a. If >1/4" of accumulation, maintenance is required.
3. Submerged cartridges.
   a. If >4" of static water in the cartridge bay for more that 24 hours after end of rain event, maintenance is required.
4. Plugged media.
   a. If pore space between media granules is absent, maintenance is required.
5. Bypass condition.
   a. If inspection is conducted during an average rain fall event and StormFilter remains in bypass condition (water over the internal outlet baffle wall or submerged cartridges), maintenance is required.
6. Hazardous material release.
   a. If hazardous material release (automotive fluids or other) is reported, maintenance is required.
7. Pronounced scum line.
   a. If pronounced scum line (say ≥ 1/4" thick) is present above top cap, maintenance is required.
8. Calendar Lifecycle.
   a. If system has not been maintained for 3 years maintenance is required.

Assumptions

- No rainfall for 24 hours or more
- No upstream detention (at least not draining into StormFilter)
- Structure is online
- Outlet pipe is clear of obstruction
- Construction bypass is plugged

Maintenance

Depending on the configuration of the particular system, maintenance personnel will be required to enter the vault to perform the maintenance.

Important: If vault entry is required, OSHA rules for confined space entry must be followed.

Filter cartridge replacement should occur during dry weather. It may be necessary to plug the filter inlet pipe if base flows is occurring.

Replacement cartridges can be delivered to the site or customers facility. Information concerning how to obtain the replacement cartridges is available from CONTECH Construction Products.

Warning: In the case of a spill, the maintenance personnel should abort maintenance activities until the proper guidance is obtained. Notify the local hazard control agency and CONTECH Construction Products immediately.

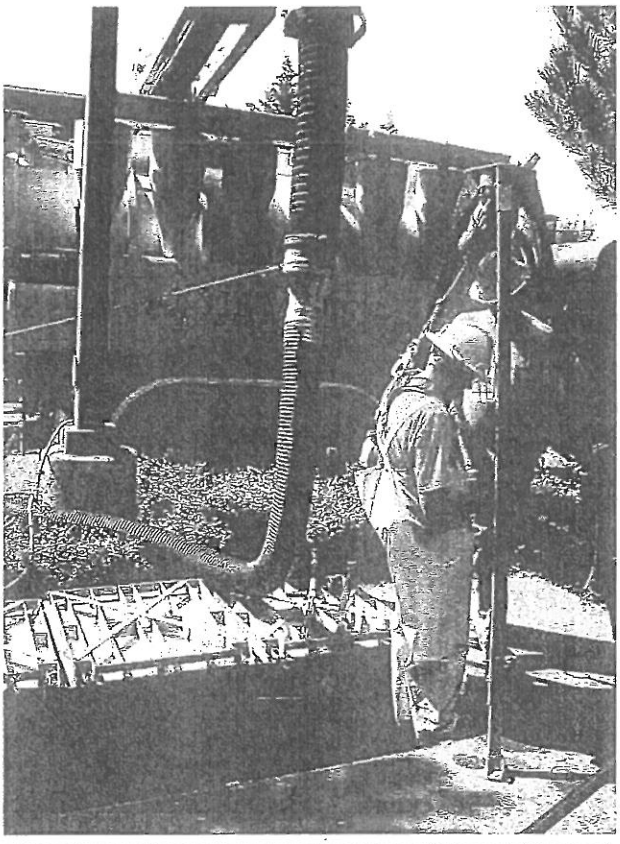
To conduct cartridge replacement and sediment removal maintenance:

1. If applicable, set up safety equipment to protect maintenance personnel and pedestrians from site hazards.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the doors (access portals) to the vault and allow the system to vent.
4. Without entering the vault, give the inside of the unit, including components, a general condition inspection.
5. Make notes about the external and internal condition of the vault. Give particular attention to recording the level of sediment build-up on the floor of the vault, in the forebay, and on top of the internal components.
6. Using appropriate equipment offload the replacement cartridges (up to 150 lbs. each) and set aside.
7. Remove used cartridges from the vault using one of the following methods:

Method 1:

A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Unscrew (counterclockwise rotations) each filter cartridge from the underdrain connector. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

Using appropriate hoisting equipment, attach a cable from the boom, crane, or tripod to the loose cartridge. Contact CONTECH Construction Products for suggested attachment devices.



Important: Note that cartridges containing leaf media (CSF) do not require unscrewing from their connectors. Take care not to damage the manifold connectors. This connector should remain installed in the manifold and could be capped during the maintenance activity to prevent sediments from entering the underdrain manifold.

B. Remove the used cartridges (up to 250 lbs. each) from the vault.

Important: Care must be used to avoid damaging the cartridges during removal and installation. The cost of repairing components damaged during maintenance will be the responsibility of the owner unless CONTECH Construction Products performs the maintenance activities and damage is not related to discharges to the system.

C. Set the used cartridge aside or load onto the hauling truck.

D. Continue steps a through c until all cartridges have been removed.

Method 2:

A. Enter the vault using appropriate confined space protocols.

B. Unscrew the cartridge cap.

C. Remove the cartridge hood screws (3) hood and float.

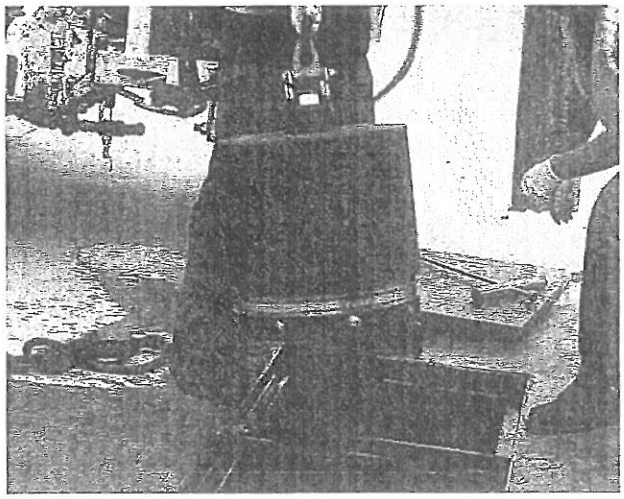
D. At location under structure access, tip the cartridge on its side.

Important: Note that cartridges containing media other than the leaf media require unscrewing from their threaded connectors. Take care not to damage the manifold connectors. This connector should remain installed in the manifold and capped if necessary.

D. Empty the cartridge onto the vault floor. Reassemble the empty cartridge.

E. Set the empty, used cartridge aside or load onto the hauling truck.

F. Continue steps a through e until all cartridges have been removed.



8. Remove accumulated sediment from the floor of the vault and from the forebay. This can most effectively be accomplished by use of a vacuum truck.
9. Once the sediments are removed, assess the condition of the vault and the condition of the connectors. The connectors are short sections of 2-inch schedule 40 PVC, or threaded schedule 80 PVC that should protrude about 1" above the floor of the vault. Lightly wash down the vault interior.
   a. Replace any damaged connectors.
10. Using the vacuum truck boom, crane, or tripod, lower and install the new cartridges. Once again, take care not to damage connections.
11. Close and fasten the door.
12. Remove safety equipment.
13. Finally, dispose of the accumulated materials in accordance with applicable regulations. Make arrangements to return the used empty cartridges to CONTECH Construction Products.

Related Maintenance Activities -

Performed on an as-needed basis

StormFilter units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the StormFilter to be successful, it is imperative that all other components be properly maintained. The maintenance/repair of upstream facilities should be carried out prior to StormFilter maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads.

Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

CONTECH CONSTRUCTION PRODUCTS INC.
800.338.1122
www.contech-cpi.com

Support

- Drawings and specifications are available at contechstormwater.com.
- Site-specific design support is available from our engineers.

CONTECH Construction Products Inc. provides site solutions for the civil engineering industry. CONTECH's portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products. For information on other CONTECH division offerings, visit contech-cpi.com or call 800.338.1122

Inspection Report

Date: _____ Personnel: _____

Location: _____ System Size: _____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

Sediment Thickness in Forebay: _____ Date: _____

Sediment Depth on Vault Floor: _____

Structural Damage: _____

Estimated Flow from Drainage Pipes (if available): _____

Cartridges Submerged: Yes ☐ No ☐ Depth of Standing Water: _____

StormFilter Maintenance Activities (check off if done and give description)

☐ Trash and Debris Removal: _____

☐ Minor Structural Repairs: _____

☐ Drainage Area Report _____

Excessive Oil Loading: Yes ☐ No ☐ Source: _____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: _____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: _____

Items Needing Further Work: _____

Owners should contact the local public works department and inquire about how the department disposes of their street waste residuals.

Other Comments:

_____

_____

_____

_____

_____

_____

_____

_____

Review the condition reports from the previous inspection visits.

StormFilter Maintenance Report

Date: _____ Personnel: _____

Location: _____ System Size: _____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

List Safety Procedures and Equipment Used: _____

_____

_____

System Observations

Months in Service:

Oil in Forebay: Yes ☐ No ☐

Sediment Depth in Forebay: _____

Sediment Depth on Vault Floor: _____

Structural Damage: _____

Drainage Area Report

Excessive Oil Loading: Yes ☐ No ☐ Source: _____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: _____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: _____

StormFilter Cartridge Replacement Maintenance Activities

Remove Trash and Debris: Yes ☐ No ☐ Details: _____

Replace Cartridges: Yes ☐ No ☐ Details: _____

Sediment Removed: Yes ☐ No ☐ Details: _____

Quantity of Sediment Removed (estimate?):

Minor Structural Repairs: Yes ☐ No ☐ Details: _____

Residuals (debris, sediment) Disposal Methods: _____

Notes:

_____

_____

_____

_____

_____

_____

_____

BEAVERCREEK ROAD
LIVE/WORK DEVELOPMENT

PRELIMINARY STORMWATER DESIGN REPORT
MAY 2014

Appendix 6

Soil Information

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Clackamas County Area, Oregon

Beavercreek Live/Work

January 7, 2014

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface.....2
How Soil Surveys Are Made.....5
Soil Map.....7
Soil Map.....8
Legend.....9
Map Unit Legend.....10
Map Unit Descriptions.....10
Clackamas County Area, Oregon.....12
45B—Jory silty clay loam, 2 to 8 percent slopes.....12
References.....13
Glossary.....15

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 7, Aug 20, 2012

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 8, 2010—Sep 4, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Clackamas County Area, Oregon (OR610)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
45B	Jory silty clay loam, 2 to 8 percent slopes	11.0	100.0%
Totals for Area of Interest		11.0	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Clackamas County Area, Oregon

45B—Jory silty clay loam, 2 to 8 percent slopes

Map Unit Setting

Elevation: 250 to 1,200 feet
Mean annual precipitation: 50 to 60 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Jory and similar soils: 90 percent

Description of Jory

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.1 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability classification (irrigated): 2e
Land capability (nonirrigated): 2e
Hydrologic Soil Group: C

Typical profile

0 to 13 inches: Silty clay loam
13 to 60 inches: Silty clay

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://soils.usda.gov/

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://soils.usda.gov/

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://soils.usda.gov/

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.glti.nrcs.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://soils.usda.gov/

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

LEGEND

- WATER VALVE
- HYDRANT
- WATER METER
- MANHOLES (SS/SD)
- CB
- POWER/UTILITY POLE
- GUY ANCHOR
- STREET LIGHT
- ROCKERY

- CENTER LINES
- PROPERTY LINES
- RIGHT-OF-WAY LINES
- LOT LINES
- DITCH LINE
- FLOW LINE
- W — WATER LINE
- SS — SANITARY SEWER LINE
- SD — STORM DRAIN LINE
- G — GAS LINE
- UP — UNDERGROUND POWER LINES
- UT — UNDERGROUND TELEPHONE LINES
- UTV — UNDERGROUND CABLE TV LINES
- UFO — UNDERGROUND FIBER OPTIC LINES
- P — OVERHEAD POWER LINES
- OHL — OVERHEAD UTILITY LINES
- CHAIN LINK FENCE
- WIRE FENCE
- WOOD FENCE

DD SET

SYM	REVISION	DATE

PACE
An Engineering Services Company
5000 Meadows Road
Lake Oswego, Oregon 97035
p. 503.597.3222 | f. 503.597.7655
Civil | Structural | Planning | Survey
paceengrs.com

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 23, 1980
ANDREW A. REITER
EXPIRES: 12/31/2014

STORM DRAINAGE PLAN

A LIVE/WORK APARTMENT AND TOWNHOME DEVELOPMENT

19896 BEAVERCREEK RD.
OREGON CITY, OR

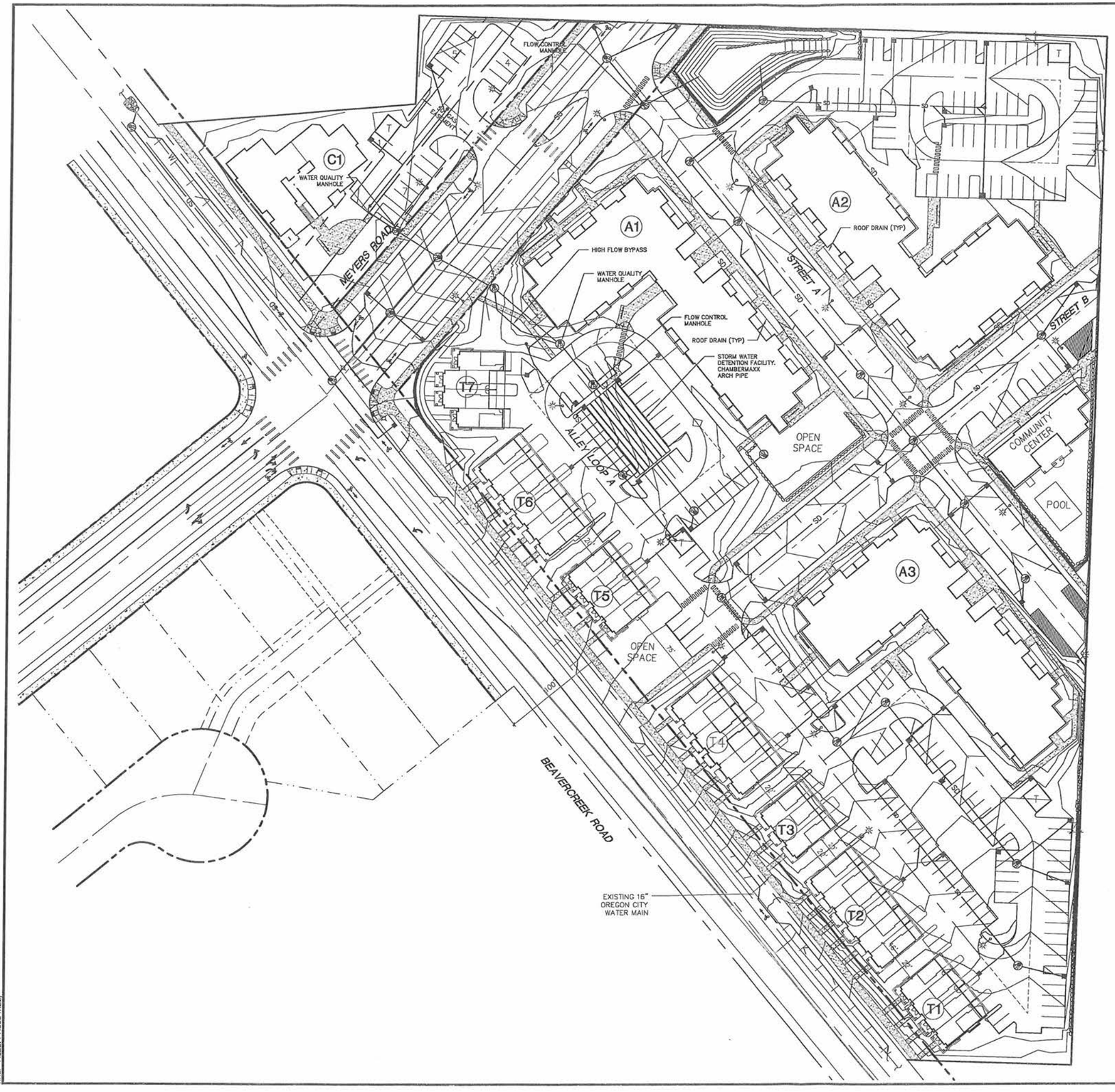
SCALE:	DATE:
1"=40'	6/06/14
DESIGNED BY:	CHECKED BY:
AAR	DP

JOB NUMBER
13869

DWG NAME:
C6 STORM DRAINAGE

SHEET C6 OF 8

FILE NAME: P:\P13\13869 - EVERGREEN HOUSING - BEAVERCREEK ROAD\CAD\SHEETS\C6 STORM DRAINAGE.DWG
SAVE TIME: 6/5/2014 3:32:16 PM
PLOT TIME: 6/6/2014 10:37 AM
USER NAME: MARK ASLAND
XREF FILES: PACE34X22.



HORIZ. 0 20 40 80
Scale In Feet

LEGEND

- WATER VALVE
- HYDRANT
- WATER METER
- MANHOLES (SS/SD)
- CB
- POWER/UTILITY POLE
- GUY ANCHOR
- STREET LIGHT
- ROCKERY
- CENTER LINES
- PROPERTY LINES
- RIGHT-OF-WAY LINES
- LOT LINES
- DITCH LINE
- FLOW LINE
- W — WATER LINE
- SS — SANITARY SEWER LINE
- SD — STORM DRAIN LINE
- G — GAS LINE
- UP — UNDERGROUND POWER LINES
- UT — UNDERGROUND TELEPHONE LINES
- UTV — UNDERGROUND CABLE TV LINES
- UFO — UNDERGROUND FIBER OPTIC LINES
- OHP — OVERHEAD POWER LINES
- OHU — OVERHEAD UTILITY LINES
- CHAIN LINK FENCE
- WIRE FENCE
- WOOD FENCE

DD SET

DATE	REVISION	SYM

PACE
An Engineering Services Company
5000 Meadows Road
Lake Oswego, Oregon 97035
p. 503.597.3222 | f. 503.597.7155
Civil | Structural | Planning | Survey
pacaengrs.com

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 23, 1980
ANDREW A. REITER
14,799
PREMINARY
EXPIRES: 12/31/2014

STORM DRAINAGE PLAN

A LIVE/WORK APARTMENT AND TOWNHOME DEVELOPMENT

19896 BEAVERCREEK RD.
OREGON CITY, OR

SCALE:	DATE:
1"=40'	6/06/14
DESIGNED BY: AAR	CHECKED BY: DP

JOB NUMBER **13869**

DWG NAME: C6 STORM DRAINAGE

SHEET C6 OF 8

FILE NAME: P:\P13\13869 - EVERGREEN HOUSING - BEAVERCREEK ROAD\CAD\SHEETS\C6 STORM DRAINAGE.DWG
SAVE TIME: 6/5/2014 3:32:16 PM
PLOT TIME: 6/6/2014 10:37 AM
USER NAME: AARON REITER
XREF FILES: PACE34X22

FOUNDATION ENGINEERING, INC.
Professional Geotechnical Services

Memorandum

Date: October 29, 2012

To: Andrew Brand
Evergreen Housing Development Group, LLC

From: Mark Catlin, P.E., G.E.
Mitch Schaub, P.E., G.E.

Subject: Reconnaissance-Level Geotechnical Investigation

Project: 19896 Beavercreek Road
FEI Project 2122022

We have completed the requested reconnaissance-level geotechnical investigation for the above-referenced site. This memorandum includes a description of our work, a discussion of site and subsurface conditions, and a brief discussion of geotechnical considerations for typical, two or three-story apartment construction.

BACKGROUND

We understand that Evergreen Housing Development Group, LLC (Evergreen) is considering the purchase of a 9.59-acre parcel located at 19896 Beavercreek Road in Oregon City, Oregon. No site-specific development plans are presently available. The site location is shown on Figure 1A (attached). Foundation Engineering, Inc. (FEI) was retained by Evergreen to conduct a reconnaissance-level geotechnical investigation to evaluate specific soil conditions that relate to constructability. These conditions are: expansive soils, compressible soils, peat, signs of landslides, and groundwater. FEI's scope of work was outlined in a proposal dated October 9, 2012, and authorized by a signed Professional Services Agreement dated October 17, 2012.

FIELD EXPLORATION

We excavated six exploratory test pits at the site on October 22, 2012. The test pit locations are shown on Figure 2A (attached). Locations were established by pacing and cloth tape, and are approximate only.

The test pits were excavated using a Kubota M-59 rubber-tired backhoe. The explorations extended to a maximum depth of 8.5 feet. The test pits were logged and representative samples were obtained in each of the test pits. The test pit logs (attached) were prepared based on a review of the field logs and an examination of the soil samples in our office.

DISCUSSION OF SITE CONDITIONS

Surface Conditions

The project site is approximately triangular with about 1,000 lineal feet of frontage on the east side of Beavercreek Road. The width of the site at the northern property line is about 700 feet, and at the south is about 150 feet. The site is mostly level and

covered with grass and some berry brambles. Several mature trees are located at the southern end of the site, surrounding the vacant residence at 19896 Beavercreek Road.

Subsurface Conditions

Topsoil. A layer of topsoil was encountered in the test pits usually to a depth of about 6 inches. In test pit TP-3, the topsoil layer extended to a depth of 1 foot. The topsoil consisted of mostly silt, with some sand, gravel, and numerous organics (roots).

Silt. Below the topsoil, a silt layer with various traces of clay, sand, gravel, and occasional cobble and boulder was encountered, extending to depths of 5 to 8 feet. The silt was typically red-brown to light brown, damp to moist, and had a consistency of medium stiff to very stiff. The silt was typically non-plastic to low plasticity; however; a low to medium plasticity clayey silt was encountered in TP-1 extending to a depth of about 2 feet.

Basalt. A moderately to highly weathered basalt rock was encountered in TP-1, TP-3, and TP-4, at depths of 5, 7, and 6.5 feet, respectively. The basalt rock typically formed a silty sandy gravel with cobble upon excavation. Refusal conditions were encountered at a depth of 8 feet in TP-4. A basalt boulder was encountered in TP-6 at a depth of about 4 feet.

Specific details of the soil conditions encountered in each test pit are provided in the attached test pit logs.

Ground Water

The predominantly silty soils encountered in the test pits were typically damp to moist. No seepage or ground water infiltration was observed in the test pits.

LABORATORY TESTING

No laboratory testing was performed.

DISCUSSION OF GEOTECHNICAL ISSUES

General Earthwork Considerations

For typical two to three-story apartment construction, the layer of topsoil would need to be removed below planned structures, roadways, parking areas, and sidewalks. Topsoil strippings may be used for landscaping but are not suitable for use under settlement-sensitive buildings or pavements.

Below the topsoil, the silt layer is moisture-sensitive and will soften significantly when disturbed or wetted. We anticipate the silt will be prone to disturbance from construction activities when exposed. Processing the silt soils for reuse as

structural fill would likely require extensive material handling and moisture conditioning. Site earthwork construction therefore should be completed during the drier summer months. We judge that if earthwork is undertaken during wet weather, it may result in an increase in earthwork construction duration and costs.

Expansive Soils

A low to medium plastic clayey silt was encountered in TP-1 to a depth of about 2 feet. It may be moderately expansive. We recommend that future development, if it occurs, remove this material below structures and replace with a non-expansive granular compacted fill.

Compressibility

The topsoil is compressible and should be excavated as discussed above. The silt layer below the topsoil was encountered in a medium stiff to very stiff condition. It is our opinion that the silt soil poses a low risk of compressibility for typical spread and isolated shallow spread footings in its undisturbed state.

Peat

We did not encounter any peat in the test pits advanced at the site. As is common, however, the topsoil contained organics (roots) and is not suitable for structural support.

Landslides

We did not observe ground surface features or soils in the test pits that indicate potential landslide activity. It is our opinion that landslides present a low risk to future development of this site.

Ground Water

No ground water was encountered in our test pits. We expect that ground water levels will fluctuate seasonally and will be significantly higher during the wet winter and spring months. Perched water, surface ponding, and surface water runoff may also develop following periods of wet weather.

SUMMARY CONCLUSIONS

Based on the conditions encountered in our preliminary work, there appears to be no subsurface conditions that would preclude development of the site. However, the sensitivity of soils to disturbance and moisture, the need for careful site preparation to protect the subgrade under foundations and pavements, and the construction schedule will likely be key geotechnical issues that will need to be addressed during design and construction. Site excavations greater than about 5 feet may encounter basalt rock. Soil consisting of gravel, cobbles and boulders may also be encountered at any depth and at any location across the site.

ADDITIONAL GEOTECHNICAL WORK

A second phase of geotechnical work is required prior to design, once the layout of specific units and roads is established. We anticipate some additional field exploration, laboratory testing, and analysis will be needed to develop recommendations for foundation design and construction, and for site grading and pavements.

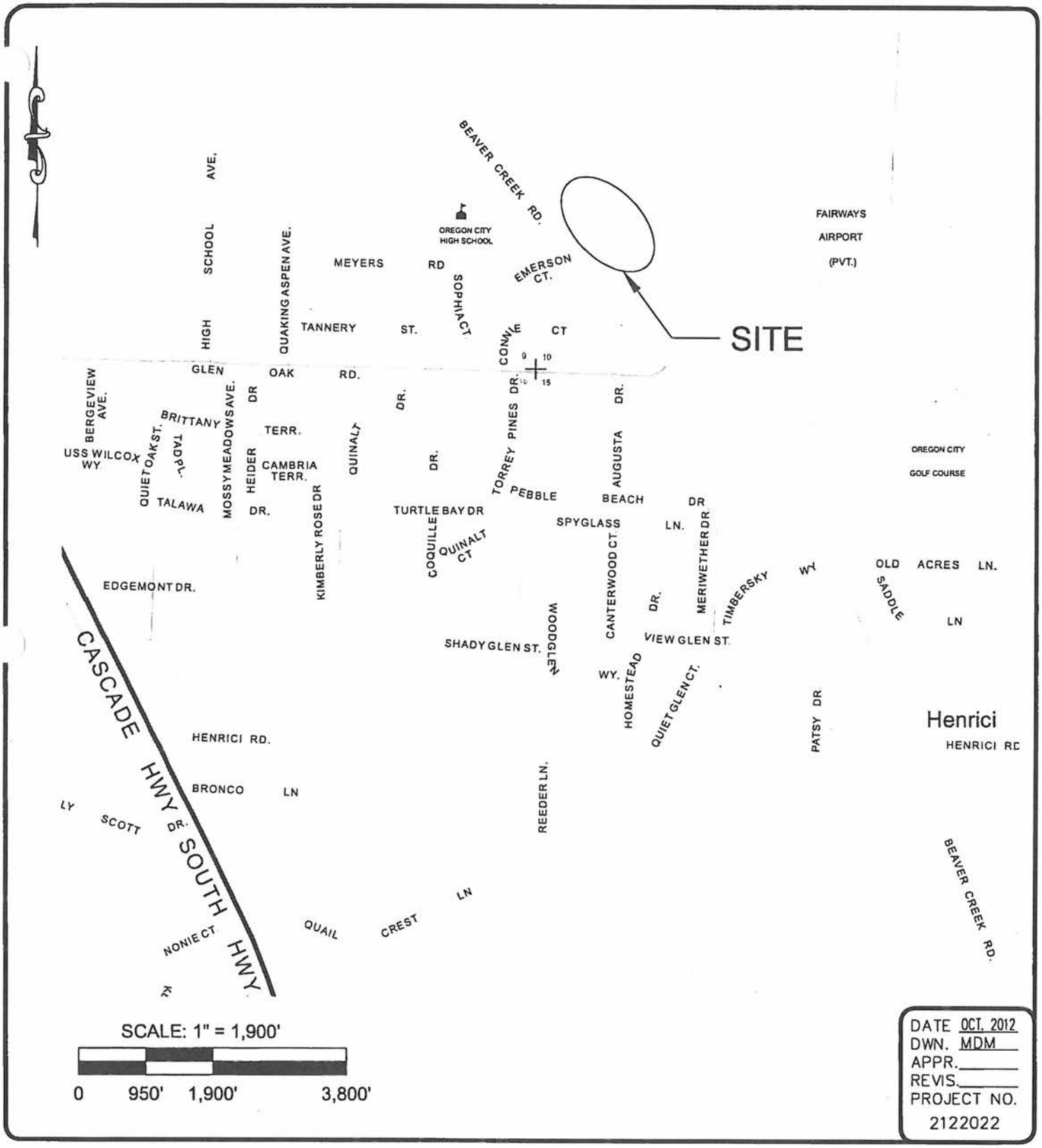
VARIATION OF SUBSURFACE CONDITIONS, USE OF THIS REPORT AND WARRANTY

The findings and conclusions contained herein are based on the assumption that the soil profiles and the absence of ground water encountered in the test pits are representative of overall site conditions.

This reconnaissance-level geotechnical memorandum was prepared for the exclusive use of Evergreen Housing Development Group, LLC for the 19896 Beavercreek Road project in Oregon City, Oregon. Information contained herein should not be used for other sites or for unanticipated construction without our written consent. This report is intended for preliminary planning. It is assumed that a more detailed geotechnical investigation will be completed prior to final design and construction.

Our work was done in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

We trust this information meets your present needs. It has been a pleasure assisting you with this phase of the project. Please do not hesitate to call if you have any questions or need further assistance.



DATE OCT. 2012
DWN. MDM
APPR.
REVIS.
PROJECT NO.
2122022

FOUNDATION ENGINEERING INC.
PROFESSIONAL GEOTECHNICAL SERVICES
8380 SW NIMBUS AVENUE
BEAVERTON, OR 97008-6445
BUS. (503) 643-1541 FAX (503) 626-2419

VICINITY MAP

19896 BEAVERCREEK ROAD
OREGON CITY, OREGON

1A

FILE NAME:

DISTINCTION BETWEEN FIELD LOGS AND FINAL LOGS

A field log is prepared for each boring or test pit by our field representative. The log contains information concerning sampling depths and the presence of various materials such as gravel, cobbles, and fill, and observations of ground water. It also contains our interpretation of the soil conditions between samples. The final logs presented in this report represent our interpretation of the contents of the field logs and the results of the laboratory examinations and tests. Our recommendations are based on the contents of the final logs and the information contained therein and not on the field logs.

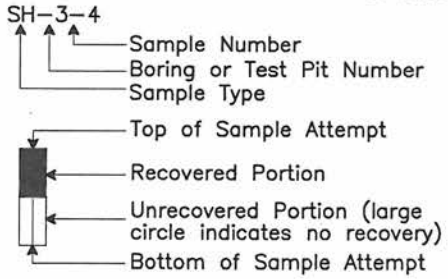
VARIATION IN SOILS BETWEEN TEST PITS AND BORINGS

The final log and related information depict subsurface conditions only at the specific location and on the date indicated. Those using the information contained herein should be aware that soil conditions at other locations or on other dates may differ. Actual foundation or subgrade conditions should be confirmed by us during construction.

TRANSITION BETWEEN SOIL OR ROCK TYPES

The lines designating the interface between soil, fill or rock on the final logs and on subsurface profiles presented in the report are determined by interpolation and are therefore approximate. The transition between the materials may be abrupt or gradual. Only at boring or test pit locations should profiles be considered as reasonably accurate and then only to the degree implied by the notes thereon.

SAMPLE OR TEST SYMBOLS



S – Grab Samples
SS – Standard Penetration Test Sample (split–spoon)
SH – Thin–walled Shelby Tube Sample
C – Core Sample
CS – Continuous Sample

▲ Standard Penetration Test Resistance equals the number of blows a 140 lb. weight falling 30 in. is required to drive a standard split–spoon sampler 1 ft. Practical refusal is equal to 50 or more blows per 6 in. of sampler penetration.

● Water Content (%).

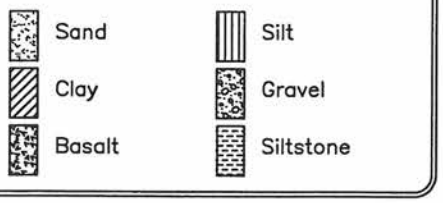
UNIFIED SOIL CLASSIFICATION SYMBOLS

G – Gravel	W – Well Graded
S – Sand	P – Poorly Graded
M – Silt	L – Low Plasticity
C – Clay	H – High Plasticity
Pt – Peat	O – Organic

FIELD SHEAR STRENGTH TEST

Shear strength measurements on test pit side walls, blocks of soil or Shelby tube samples are typically made with Torvane or pocket penetrometer devices.

TYPICAL SOIL/ROCK SYMBOLS



WATER TABLE


Water Table Location

(1/31/00) Date of Measurement


Piezometer Tip Location (if used)

FOUNDATION ENGINEERING INC.
PROFESSIONAL GEOTECHNICAL SERVICES

8380 SW NIMBUS AVE
BEAVERTON, OR 97008
BUS. (503) 641–1541 FAX (503) 626–2419

SYMBOL KEY
BORING AND TEST PIT LOGS

Explanation of Common Terms Used in Soil Descriptions

Field Identification	Cohesive Soils			Granular Soils	
	SPT	S_u^* (tsf)	Term	SPT	Term
Easily penetrated several inches by fist.	0 – 1	< 0.125	Very Soft	0 – 4	Very Loose
Easily penetrated several inches by thumb.	2 – 4	0.125–0.25	Soft	5 – 10	Loose
Can be penetrated several inches by thumb with moderate effort.	5 – 8	0.25 – 0.50	Medium Stiff (Firm)	11 – 30	Medium Dense
Readily indented by thumb but penetrated only with great effort.	9 – 15	0.50 – 1.0	Stiff	31 – 50	Dense
Readily indented by thumbnail.	16 – 30	1.0 – 2.0	Very Stiff	> 50	Very Dense
Indented with difficulty by thumbnail.	31 – 60	> 2.0	Hard		

* Undrained shear strength

Term	Soil Moisture Field Description
Dry	Absence of moisture. Dusty. Dry to the touch.
Damp	Soil has moisture. Cohesive soils are below plastic limit and usually moldable.
Moist	Grains appear darkened, but no visible water. Silt/clay will clump. Sand will bulk. Soils are often at or near plastic limit.
Wet	Visible water on larger grain surfaces. Sand and cohesionless silt exhibit dilatancy. Cohesive silt/clay can be readily remolded. Soil leaves wetness on the hand when squeezed. "Wet" indicates that the soil is wetter than the optimum moisture content and above the plastic limit.

Term	PI	Plasticity Field Test
Nonplastic	0 – 3	Cannot be rolled into a thread.
Low Plasticity	3 – 15	Can be rolled into a thread with some difficulty.
Medium Plasticity	15 – 30	Easily rolled into thread.
High Plasticity	> 30	Easily rolled and rerolled into thread.

Term	Soil Structure Criteria
Stratified	Alternating layers at least 1 inch thick – describe variation.
Laminated	Alternating layers at less than 1 inch thick – describe variation.
Fissured	Contains shears and partings along planes of weakness.
Slickensides	Partings appear glossy or striated.
Blocky	Breaks into lumps – crumbly.
Lensed	Contains pockets of different soils – describe variation.

Term	Soil Cementation Criteria
Weak	Breaks under light finger pressure.
Moderate	Breaks under hard finger pressure.
Strong	Will not break with finger pressure.

FOUNDATION ENGINEERING INC.
PROFESSIONAL GEOTECHNICAL SERVICES
8380 SW NIMBUS AVE.
BEAVERTON, OR 97008
BUS. (503) 643-1541 FAX (503) 626-2419

COMMON TERMS
SOIL DESCRIPTIONS

Explanation of Common Terms Used in Rock Descriptions

Field Identification		UCS (psi)	UCS (MPa)	Strength (Hardness)
Indented by thumbnail.	R0	< 100	0.25–1.0	Extremely Weak (Extremely Soft)
Crumbles under firm blows with geological hammer, can be peeled by a pocket knife.	R1	100–1000	1.0–5.0	Very Weak (Very Soft)
Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with geological hammer.	R2	1000–4000	5.0–25	Weak (Soft)
Cannot be scraped or peeled with a pocket knife, specimen can be fractured with a single blow of geological hammer.	R3	4000–8000	25–50	Medium Strong (Medium Hard)
Specimen requires more than one blow of geological hammer to fracture it.	R4	8000–16000	50–100	Strong (Hard)
Specimen requires many blows of geological hammer to fracture it.	R5	16000–36000	100–250	Very Strong (Very Hard)
Specimen can only be chipped with geological hammer.	R6	> 36000	> 250	Extremely Strong (Extremely Hard)

Term	Weathering Field Identification
Fresh	Crystals are bright. Discontinuities may show some minor surface staining. No discoloration in rock fabric.
Slightly Weathered	Rock mass is generally fresh. Discontinuities are stained and may contain clay. Some discoloration in rock fabric.
Moderately Weathered	Significant portions of rock show discoloration and weathering effects. Crystals are dull and show visible chemical alteration. Discontinuities are stained and may contain secondary mineral deposits.
Highly Weathered	Rock can be excavated with geologist's pick. All dicontinuities exhibit secondary mineralization. Complete discoloration of rock fabric. Surface of core is friable and usually pitted due to washing out of highly altered minerals by drilling water.
Decomposed	Rock mass is completely decomposed. Original rock "fabric" may be evident. May be reduced to soil with hand pressure.

Spacing (meters)	Spacing (feet)	Spacing Term	Bedding/Foliation
< 0.06	< 2 in.	Very Close	Very Thin
0.06 – 0.30	2 in. – 1 ft.	Close	Thin
0.30 – 0.90	1 ft. – 3 ft.	Moderately Close	Medium
0.90 – 3.0	3 ft. – 10 ft.	Wide	Thick
> 3.0	> 10 ft.	Very Wide	Very Thick (Massive)

Vesicle Term	Volume
Some	3 – 20%
Highly	20 – 50%
Scoria	> 50%

Stratification Term	Description
Lamination	<0.39 in. thick beds
Fissile	Preferred break along laminations
Parting	Preferred break direction
Foliation	Metamorphic layering of minerals

RQD %	Designation	RQD %	Designation
0 – 25	Very Poor	75 – 90	Good
25 – 50	Poor	90 – 100	Excellent
50 – 75	Fair		

Rock Quality Designation (RQD) is the percent of a core run with intact lengths greater than 4.0 in. excluding breaks caused by drilling.

FOUNDATION ENGINEERING INC.
PROFESSIONAL GEOTECHNICAL SERVICES
8380 SW NIMBUS AVE.
BEAVERTON, OR 97008
BUS. (503) 643-1541 FAX (503) 628-2419

COMMON TERMS
ROCK DESCRIPTIONS

Comments	Depth, Feet	Sample #	Location	Class Symbol	Water Table	C, TSF	Symbol	Soil and Rock Description
								SILT with organics, (ML) (±6 inches); dark brown, (topsoil).
	1-							Medium stiff SILT/CLAY, (ML/CL); dark red-brown, low to medium plasticity, moist, occasional rootlet, (organics).
	2-	S-1						
	3-	S-2						Medium stiff to stiff sandy SILT, some gravel, (ML); red-brown and yellow-brown, moist to wet, non-plastic, gravel is subrounded/angular basalt, occasional black organic staining.
	4-							
	5-	S-3						(R2 to R3) BASALT; grey-brown, moderately to highly weathered, remolds to sandy SILT (ML), moist, non-plastic.
	6-							
	7-							
	8-							BOTTOM OF TEST PIT

Project No.: 2122022

Surface Elevation: (Approx.)

Date of Test Pit: October 22, 2012

Test Pit Log: TP-1

19896 Beavercreek Road

Oregon City, Oregon

Comments	Depth, Feet	Sample #	Location	Class Symbol	Water Table	C, TSF	Symbol	Soil and Rock Description
								SILT with organics, (ML); dark brown, (topsoil).
	1-							Stiff SILT, with gravel and cobbles, (ML); dark red-brown, moist, non-plastic, occasional organics.
	2-	S-1						
	3-							Very stiff SILT with gravel and cobbles, (ML); red-brown to yellow-brown, moist, non to low plasticity, occasional black organic staining.
	4-	S-2						
	5-							
	6-							
	7-							
	8-							BOTTOM OF TEST PIT

Project No.: 2122022

Surface Elevation: (Approx.)

Date of Test Pit: October 22, 2012

Test Pit Log: TP-2

19896 Beavercreek Road

Oregon City, Oregon

Comments	Depth, Feet	Sample #	Location	Class Symbol	Water Table	C, TSF	Symbol	Soil and Rock Description
								SILT with organics, (ML) (±1 foot); dark brown, (topsoil).
	1							Medium stiff to stiff SILT, (ML); red-brown, moist, low plasticity, occasional black organic staining.
	2							
	3	S-1						
	4							
Becomes very stiff at 4 feet.	5	S-2						
	6							
	7							(R2 to R3) BASALT; grey-brown, slightly to moderately weathered, moist.
Refusal at 8 feet.	8							BOTTOM OF TEST PIT

Project No.: 2122022

Surface Elevation: (Approx.)

Date of Test Pit: October 22, 2012

Test Pit Log: TP-3

19896 Beavercreek Road

Oregon City, Oregon

Comments	Depth, Feet	Sample #	Location	Class Symbol	Water Table	C, TSF	Symbol	Soil and Rock Description
								SILT with organics, (ML) (±6 inches); dark brown, (topsoil).
	1							Stiff to very stiff SILT, (ML); red-brown, dry to moist, non to low plasticity, occasional black organic staining.
	2							
	3	S-1						
	4							
	5							
	6							
	7	S-2						(R1 to R2) BASALT; grey-brown, slightly to highly weathered.
	8							BOTTOM OF TEST PIT

Project No.: 2122022

Surface Elevation: (Approx.)

Date of Test Pit: October 22, 2012

Test Pit Log: TP-4

19896 Beavercreek Road

Oregon City, Oregon

Comments	Depth, Feet	Sample #	Location	Class Symbol	Water Table	C, TSF	Symbol	Soil and Rock Description
Occasional coarse gravel and cobble (basalt) at 4 feet.	1 2 3 4 5 6 7 8	S-1 S-2						SILT with organics, (ML) (±6 inches); dark brown, (topsoil). Medium stiff to stiff SILT, (ML); red-brown, dry to moist, non to low plasticity, occasional black organic staining. BOTTOM OF TEST PIT

Project No.: 2122022

Surface Elevation: (Approx.)

Date of Test Pit: October 22, 2012

Test Pit Log: TP-5

19896 Beavercreek Road

Oregon City, Oregon

Comments	Depth, Feet	Sample #	Location	Class Symbol	Water Table	C, TSF	Symbol	Soil and Rock Description
Basalt boulder enc. ±18 inches diameter, grey-brown, at 4 to 5 feet.	1 2 3 4 5 6 7 8 9	S-1 S-2						SILT with organics, (ML); dark brown, (topsoil). Medium stiff to stiff SILT, some organics, (ML); red-brown, dry to moist, non to low plasticity, partially cemented, occasional black organic staining. BOTTOM OF TEST PIT

Project No.: 2122022

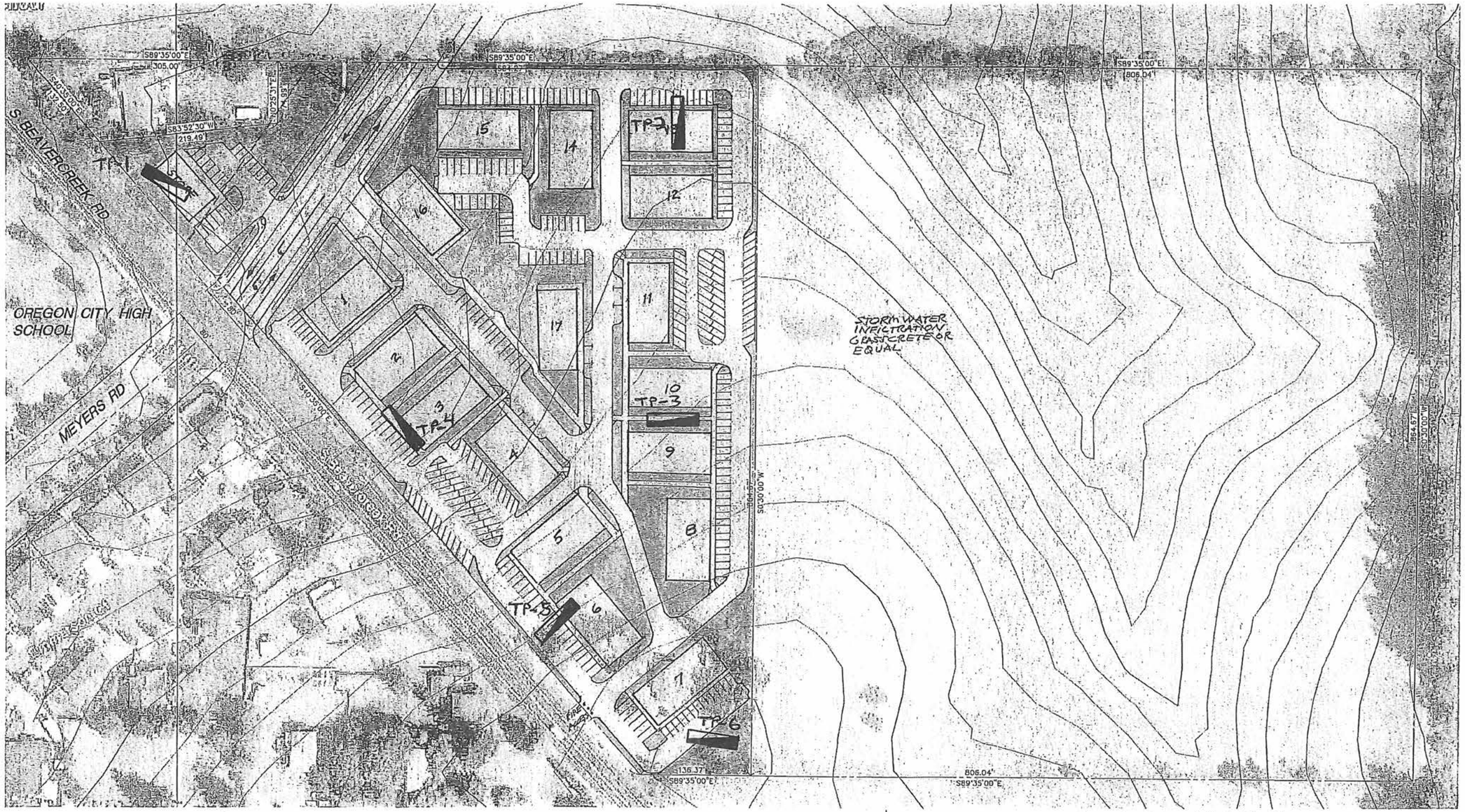
Surface Elevation: (Approx.)

Date of Test Pit: October 22, 2012

Test Pit Log: TP-6

19896 Beavercreek Road

Oregon City, Oregon



LEGEND

▬ APPROXIMATE LOCATIONS OF TEST PITS by FEI (10-22-12)

GRAPHIC SCALE
60 0 60 120
(IN FEET)
1 inch = 60 ft.

- 300 PARKING SPACES SHOWN - 1.97 SPACES/UNIT
- 17 BLDGS - 12 UNITS/BLDGS

CAD/CALC XXX					
DRAWN XXX					
PLAT CHK XXX					
SYM	REVISION	DATE	BY	APP'D	

PACE
An Engineering Services Company

5000 Meadows Road, Suite 345
Lake Oswego, OR 97035
p. 503.597.3222 | f. 503.597.7655
Civil | Structural | Planning | Survey
paceengrs.com

PROPOSED DEVELOPMENT
OPTION B

DATE 3/27/2012
SCALE: BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"

PRELIMINARY SITE PLAN
FOR
DLB CAPITAL MANAGEMENT LLC.

PROJECT NO. 00000
SHEET 1 OF 1

DWG NAME: P:\PD_2012 FEI PROPOSALS\SITE KEY\PD-12_MASSIE DEVELOPMENT_BEAVERCREEK-MEYERS ROAD\DWG\MASSIE.dwg & MORSING
LAYOUT TAB: OPTION 2
PLOT DATE: 3/27/2012 3:33:43 PM
PLOT BY: Mike Morsing
USER NAME: Mike Morsing
XREF FILES:

Figure 2A

Oregon City Live/Work
Evergreen Housing Development Group

11/10/2014

Floor Area Ratio Calculation

Building	First Floor	Second Floor	Third Floor
Clubhouse	2798	0	0
C1	6391	6391	6391
A1	17545	17111	17111
A2	17545	17111	17111
A3	16806	16285	16285
T1	2507	2893	2689
T2	3756	4334	3995
T3	1883	2172	2019
T4	3756	4334	3995
T5	2507	2893	2689
T6	3756	4334	3995
T7	2507	2893	2689
Floor Total	**81757**	**80751**	**78969**

Total Gross Square Footage **241477**

Total site area **369496**

FAR = **0.653531**

KELLER associates

Technical Memo

REGISTERED PROFESSIONAL ENGINEER 73454PE OREGON JULY 15, 2003 JAMES BLEDSOE

EXPIRATION DATE: 12-31-15

TO: Andrew Brand, Director of Development
Evergreen Housing Development Group, LLC

FROM: James Bledsoe, PE

DATE: September 9, 2014

SUBJECT: Sewer Service to the Beavercreek Development

Background

The proposed Beavercreek Apartment Development is located east of S. Beavercreek Road in Oregon City, Oregon. The City's Draft Sanitary Sewer Master Plan (May 20, 2014) shows this area being serviced by a new sanitary sewer trunkline to be located in S. Beavercreek Road. A subsequent evaluation of a portion of the Beavercreek Road basin (identified as Areas 1 and 2 in Figure 1 below) was subsequently completed by Brown and Caldwell (BC). The build-out impacts on the Glen Oak Road sewer for Areas 1 and 2 was summarized by BC in a technical memorandum dated June 30, 2014. The proposed Beavercreek Apartment Development encompasses approximately 11 acres and is located within Area 1.

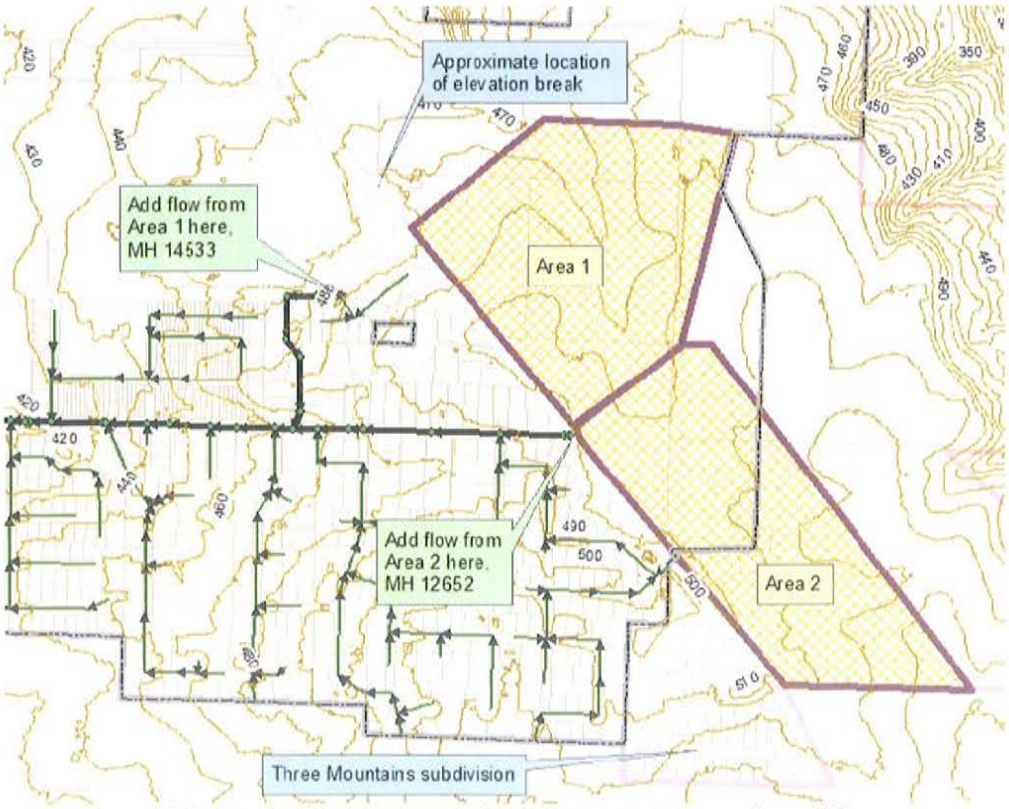


Figure 1: Beavercreek Development, Area 1 and 2
(from Brown and Caldwell June 30, 2014 Technical Memorandum)

Keller Associates was contracted by Evergreen Housing Development Group, LLC to evaluate the availability of sewer service in the existing Glen Oak Road Sewer for the Beavercreek Development. This effort involved a review of Oregon City's Draft Sanitary Sewer Master Plan and subsequent technical memorandum prepared by BC. Brown and Caldwell also provided a letter on August 8, 2014 to address specific comments and questions Keller Associates had relative to the master plan and technical memorandum. This technical memorandum presents our findings.

General Observations

The approach taken by BC in evaluating the existing collection system appears to be in line with industry standards. Planning criteria, including peaking factors, design storm events, future flow assumptions, and infiltration and inflow (I/I) assumptions also appear to be in line with industry standards, customized to the unique local conditions of the region. Flow data gathered throughout the system (including one location downstream of the Glen Oak Road sewer line) also provide a level of assurance that the existing model and evaluation reflect existing field conditions.

The estimated combined build-out flow from the Beavercreek Areas 1 and 2 was calculated by BC to be approximately 421 gpm, which is more than the available capacity in the Glen Oak Road sewer. Keller Associates does not object with BC findings that the best *long-term* approach for servicing the entire Beavercreek service area appears to be a new sewer trunkline along S. Beavercreek Road. This service approach ultimately directs available capacity in the Glen Oak Road Sewer and the downstream pipeline in HWY 213 for undeveloped areas adjacent to these pipelines, while providing for build-out of both the Beavercreek and Glen Oak service areas.

Flow projections prepared by Evergreen Housing Development's project engineer, PACE Engineering, estimate a total flow of approximately 105 gpm for the Beavercreek Apartment Development. These projections were developed using similar assumptions to those used by BC in estimating flow projections for this sewer basin (80 gpcd, 2.5 people per household, and I/I rates similar to the existing developments). Refer to Attachment A for a copy of PACE engineering calculations. With improved construction materials and installation techniques, it is anticipated that substantially less I/I will be present in the development lines and that actual flows will be less than reported.

It should also be noted that constructing the Beavercreek Sewer Trunkline to service only the Beavercreek Apartment Development could introduce other operation and maintenance challenges until such time as increased flows provided sufficient scouring velocities in the new sewer line.

Available Capacity in the Glen Oak Sewer Line

While construction of the S. Beavercreek Road pipeline may be the best long-term solution for serving the Beavercreek area, there is available capacity in the Glen Oak Road sewer for new development. Brown and Caldwell reported an **estimated remaining capacity of approximately 225 gpm** in the downstream Hwy 213 and Glen Oak Road conveyance system, assuming full pipe conditions and existing peak flow conditions (10-year evaluation event). Surcharged conditions were not considered in estimating the existing remaining capacity, presumably because of the minimal cover above the pipe (only two feet) near the

location where the Glen Oak Road sewer discharges into the Hwy 213 sewer (nodes 12371 and 12372). Regardless of the source of additional flows in the Glen Oak Road sewer, Keller Associates recommends that the manholes with only two feet of cover be equipped with bolted down, sealed manholes if these are currently not in place.

The City desires to reserve approximately 20 gpm of the available 225 gpm capacity for the existing Three Mountains subdivision (currently on septic systems). This would leave approximately 205 gpm of uncommitted capacity that could be used to service a portion of Areas 1 and 2 of the Beavercreek Development. **Allowing the proposed Beavercreek Apartment Development to gravity flow to Glen Oak Road would still leave approximately 100+ gpm of uncommitted capacity for future downstream development.**

While accommodating the Beavercreek Apartment Development in the Glen Oak Road sewer would direct flows across sewer basins on a short-term basis, it is worth noting that the area can gravity flow to the Glen Oak Road sewer system. Additionally, in the short-term there may be operational benefits to the City to direct flow into the Glen Oak Road sewer. Allowing flow from Beavercreek Development to go to the Glen Oak Road sewer would also allow the large capital expenditures of the Beavercreek Sewer Trunkline project to be delayed without exceeding the capacity of the existing pipelines, giving the City and development community more time to plan for and fund the new trunkline. Flow from the Beavercreek Development could eventually be routed into the Beavercreek Sewer Trunkline, and provisions for this transfer should be incorporated into the design of the Beavercreek Development.

Accommodating the Beavercreek Apartment Development in the Glen Oak Road sewer does not obligate the City to service other future developments in Areas 1 and 2 within the Glen Oak Road sewer. Should Areas 1 and 2 be committed long-term to the Glen Oak Road sewer, then as an alternative to the Beavercreek Sewer Trunkline, it may be possible to complete downstream improvements in Hwy 213 to alleviate surcharged conditions in the City's Glen Oak Road sewer. In their June 30, 2014 technical memorandum, BC estimated that a $537,000 pipe upsizing project in Hwy 213 would alleviate the surcharged conditions in the City-owned Glen Oak Road sewer.

One of the concerns expressed by the City in allowing Beavercreek Apartment Development to discharge into the Glen Oak Road sewer is that the flow utilizes available downstream capacity in HWY 219 that could be dedicated to other developments. The City also recognizes that significant contributions of I/I utilize available pipe capacity. Reducing the amount of I/I could free up pipe capacity for development. The cost to reduce flow by reducing I/I is a function of a number of factors, including the presence of direct storm water connections, topography, climate, groundwater levels, soil conditions, and pipe material conditions.

Keller Associates investigated whether there are benchmarks for estimating typical cost per gallon for I/I removed from a wastewater collection system. Contact was made with the City of Eugene, City of Springfield, City of Salem, City of Portland, and Clean Water Services. All of these entities desire to obtain this information, but do not have it at the present time. Clean Water Services reported that they have done similar research on the

topic and were also not able to obtain results in the Western United States. Some of the best available data comes from Massachusetts where there are several regional systems that assess development a fee to allow the development to occur. The cost charged to offset I/I is derived from a mix of technical and political discussions. Many municipalities use a factor referred to as an offset ratio which is multiplied by what they anticipate the actual cost. For example, if there is an offset ratio of 1.25 to 1, a developer would pay 125% the actual anticipated cost to remove the I/I. Depending on the municipality, this fee would be assessed the developer based on either average or peak anticipated flows from the development. Using the available data we were able to find, the average cost to remove I/I was about $5/gallon/day based on average daily flows. Obviously, if a large point source of I/I can be identified, the cost to reduce could be much lower. Likewise, a community with a history of aggressive I/I reduction efforts may find that the incremental cost to further reduce I/I could be much higher.

Attachment A

MEMORANDUM

Date: August 27, 2014

To: Dave Poulson,PE, Branch Manager, PACE Engineers, Inc.

From: Bill Pavlich, PE, PACE Engineers, Inc.

Subject: **Oregon City Live/Work – Sewer Flow Computation**
PACE Project No. 13869

Methodology

The methodology used for this sewer flow analysis is largely based on data and approaches utilized in the City's recent *Draft Sewer System Master Plan* (D-SSMP) and *Draft Technical Memo* March 3, 2014 (D-TM)prepared by Brown and Caldwell. Plans for the proposed development have been sufficiently developed so as to determine specific sewer main sizes and lengths and the number of housing units; consequently, the calculations are based on the specific characteristics where possible rather than general planning, per-acre allowances.

Oregon City Live/Work - Sewer Related Design Characteristics

- 1,794 lineal feet of 8-inch gravity sewer main tributary to the Glen Oaks subbasin.
- 180 dwelling units (du) (*147 apartments, 33 townhomes*).

Analysis Parameters

The following analysis parameters and approaches are based on information obtained or derived from the D-SSMP and D-TM.

- Persons per household (pph) = 2.5
- Average daily sewer contribution = 80 gallons per capita day (gpcd). *(Note this is an older per capita standard; newer standards are typically lower.)*
- Peak Factor = 3.6 (*This is conservatively estimated from Table 11 (p. A19, D-SSMP) the entry ("Main Street") used for a comparable size of development in terms of acreage and population).*
- Peak I/I = 8,144 gallons per inch of pipe diameter per mile per day (gpimd). *(This is the figure determined for the Glen Oaks subbasin in Table ES-5 (p. xiv, D-SSMP) and represents a very conservative estimate of future I/I in the Oregon City Live/Work development. Note typical design standards (such as the Ten State Standards) allow only 100 gpimd when testing new construction.)*

PACE

PACE Engineers, Inc.
5000 Meadows Road, Suite 345
Lake Oswego, OR 97035
Phone: 503.597.3222 Fax: 503.597.7655

Calculations

Domestic wastewater average daily flow:

180 du x 2.5 pph x 80 gpcd = 36,000 gpd (25 gpm)

Peak domestic wastewater flow:

36,000 gpd x 3.6 = 129,600 gpd (90 gpm)

Peak I/I:

8,144 gpimd x 8 in x (1,794 LF/ 5,280) = 22,137 gpd (15.4 gpm)

Combined peak domestic and I/I flow:

129,600 gpd (domestic) + 22,137 gpd (I/I) = 151,737 gpd (105.4 gpm)

Impacts

The D-TM showed flow attenuation (diminishing of the peak flow) occurring at a few locations downstream of the connection (manhole #12652) with the proposed development (see Table 3, D-TM). Flow attenuation resulted in flows that were approximately 98% of the peak at manhole # 12370, and 83% of the peak at manhole # 11776 for Alternative B. Assuming a similar attenuation to occur for the 105.4 gpm calculated above would result in the following peak flows as the flow passes through each of the noted manholes:

MH-12652	100.0%	105.4 gpm
MH-12903	99.3%	104.7 gpm
MH-12370	98.3%	103.6 gpm
MH-11776	83.2%	87.7 gpm

The attenuation percentages above were based on routing 285 gpm (D-TM); for 105.4 gpm the attenuation percentages are likely lower, but without modelling it is not possible to more accurately determine the attenuation in the system.

Actual peak flows from the proposed development are likely to be lower than the calculated 105.4 gpm. The nature of the development (apartments and townhouses) will likely have an average occupancy lower than the 2.5 pph used above. Modern fixtures and appliances are much more water efficient: typical interior water usage for such dwellings is 51.9 gpcd (source: Metcalf & Eddy, Wastewater Engineering: Treatment and Reuse, 2003) – considerably lower than the 80 gpcd noted above. Initial I/I should be nominal assuming quality engineering and construction. We understand the need to be conservative in planning and design; however, these consideration suggest real world impacts considerably less than 105.4 gpm.

Clackamas River Water
P. O. Box 2439
Clackamas, Oregon 97015-2439

ADDRESS SERVICE REQUESTED

PORTLAND
OR 970
22 AUG '14
PM 2 L

UNITED STATES POSTAGE
PITNEY BOWES
02 1P $ 000.48⁰
0000805758 AUG 22 2014
MAILED FROM ZIP CODE 97015

Pete Walter, AICP, Associate Planner
Oregon City Community Development Department
221 Molalla Avenue, Ste. 200
Oregon City, Oregon 97045

97045307350

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

LAND USE APPLICATION TRANSMITTAL

July 24, 2014

CITY STAFF DISTRIBUTION	*MAIL-OUT DISTRIBUTION*
❑ BUILDING OFFICIAL ✓	❑ NEIGHBORHOOD ASSOCIATION _Caufield ✓
❑ DEVELOPMENT SERVICES MANAGER ✓	❑ NATURAL RESOURCES COMM. (NRC)
❑ PUBLIC WORKS- OPERATIONS ✓	❑ CLACKAMAS COUNTY TRANSP. & PLANNING ✓
❑ CITY ENGINEER ✓	❑ CLACKAMAS FIRE DISTRICT #1 ✓
❑ PUBLIC WORKS DIRECTOR ✓	❑ ODOT – Division Review ✓
❑ TECHNICAL SERVICES (GIS) ✓	❑ OREGON CITY SCHOOL DISTRICT ✓
❑ PARKS MANAGER ✓	❑ TRI-MET ✓
❑ ADDRESSING	❑ METRO ✓
❑ POLICE ✓	❑ OREGON CITY POSTMASTER
TRAFFIC ENGINEER	❑ DLCD
❑ REPLINGER AND ASSOCIATES ✓	❑ CITY ATTORNEY ✓
	❑ OTHER: _____
Mailed Notice to County CPO's	
❑ Central Pt-New Era-Leland / Holcomb-Outlook/Beavercreek ✓	
Mailed Notice	
❑ Within 300' ✓	

PUBLIC COMMENTS DUE:	6:00 p.m., August 11, 2014
REVIEW COMMENTS DUE:	6:00 PM, August 25, 2014
HEARING DATE:	Type II – Not applicable
HEARING BODY:	_XX__**Staff Review;** _____PC; _____CC
FILE # & TYPE:	SP 14-01: Site Plan and Design Review for a 121-unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1) – East side of Beavercreek Road
PLANNER:	Pete Walter, AICP, Planner (503) 496-1568
PROJECT WEBSITE:	http://www.orcity.org/planning/landusecase/sp-14-01-beavercreek-road-apartments-live-work-units
APPLICANT:	Beavercreek Road, LLC, Attn: Andrew Brand
LOCATION:	19896 Beavercreek Rd, Oregon City OR 97045 (See Vicinity Map on Public Notice) Clackamas County Map 3-2E-10C Tax Lot 800

This application material is referred to you for your information, study and official comments. If hard copies are required, please contact the Planning Department. Your recommendations and suggestions will be used to guide the Planning staff when reviewing this proposal. If you wish to have your comments considered and incorporated into the staff report, please return the attached copy of this form to facilitate the processing of this application and ensure prompt consideration of your recommendations.

Please check the appropriate spaces below. Attach additional pages if needed.

_____ The proposal does not conflict with our interests.

_____ The proposal conflicts with our interests for the reasons stated below.

__X__ The proposal would not conflict our interests if the changes noted below are included.

See attached CRW comments

Signed Betty Lefton

Title Engineering associates

PLEASE RETURN YOUR COPY OF THE APPLICATION AND MATERIAL WITH THIS FORM.

Clackamas River Water

Date:	August 22, 2014	**SENT VIA EMAIL**
To:	Pete Walter, Planner City of Oregon City	
From:	Betty Johnson, Engineering Associate Clackamas River Water	
Subject:	Land Use Application:	**File** #SP 14-01
Applicant:	Beavercreek Road, LLC Andrew Brand 600 University Street, Suite 1708 Seattle, WA 98101	
Site Address:	19896 Beavercreek Rd, Oregon City, OR 97045	
Legal Description:	32E10C 00800	

CRW Comments:

This property was withdrawn from the Clackamas River Water (CRW) service boundary and annexation completed in 2008 per Ordinance: 07-1021. The property is within the City's Beavercreek Concept planning area but due to low water pressure has elected not to allow City water service to the property. Beavercreek Road, LLC has contacted CRW inquiring if the District would be able to provide water service for the development. A preliminary hydraulic model indicates that the District's Beavercreek Pressure Zone has the capability to provide both volume and pressure.

The attached CRW letter to Evergreen Housing Development Group outlines the District's minimum requirements as summarized below:

- Per Section 9 of the CRW's Rules and Regulations *Service Outside District* the applicant must seek approval from the CRW Board of Commissioners to provide water service to this exterritorial development.
- Be prepared to comply with an Intergovernmental Agreement between the City and CRW, allowing the district to provide water to the property described and other requirements to be determined.
- Evergreen Housing Development shall sign a "Developer's Agreement" `with CRW.

- Evergreen Housing Development shall be responsible for all costs associated with the design and construction of a waterline and metering vault assembly including hydraulic modeling efforts by CRW, project review and inspection.
- The waterline, once constructed and accepted, will be donated to the City to maintain and operate.
- The master meter and vault assembly serving the development will be donated to CRW to maintain and operate.

On August 18, 2014, Beavercreek Road LLC provided a written request to CRW to provide water service to the referenced property (see attached letter). Based on this request CRW staff is preparing an agenda item for the CRW Board of Commissioners to consider providing water service to this exterritorial property.

CRW requests direction from the City to determine if CRW will be allowed to provide water service to the referenced property, with the understanding that agreements will meet both the City and CRW requirements.

For further information regarding these comments please contact Bob George, 503-722-9228.

Clackamas River Water

P.O. Box 2439
Clackamas, Oregon 97015-2439

(503) 722-9220
Fax (503) 656-7086

16770 SE 82nd Drive, Clackamas
customerservice@crwater.com

June 10, 2014

Andrew Brand
Evergreen Housing Development Group, LLC
600 University Street, Suite 1708
Seattle, WA 98101

Subject: Water Service for 19896 Beavercreek Rd. – REF: SP 14-01 / PA-13-24

Mr. Brand,

Based on documentation from Oregon City and Evergreen Housing Development Group, the current development plan has the site to be developed with 121 rental apartments and 62 live-work units. Due to low available water pressure the City has determined that the site cannot be served from the existing City's 16-inch water main (590HGL) that fronts the property. Multiple solutions utilizing the main have been offered by Evergreen Housing Development (Developer) to the City, but none have met the City requirements.

Per our conversations, you have shown an interest working with CRW in development of a water main from CRW's Beavercreek Pressure Zone to the development site. CRW's Beavercreek Pressure Zone (744HGL – high level) is located approximately 850 feet south of the site along Beavercreek Road. A review of the property indicates that it is within the City's limits and outside the Clackamas River Water (CRW) district's service boundary. Also our preliminary review indicates that pressure and volume from this pressure zone could meet the City's requirement.

For CRW to consider this option, you will be required as a minimum be prepared to comply to or complete the following items.

- Be prepared to comply with an Intergovernmental Agreement between the City and CRW, allowing the district to provide water to the property described and other requirements to be determined.
- The CRW Board will need to provide a Resolution allowing water to be provided exterritorialy.
- Evergreen Housing Development shall be responsible for all costs associated with the design and construction of a waterline and metering assembly sized to meter domestic water requirements. This would include hydraulic modeling efforts by CRW, project review and inspection.

- The waterline once constructed and accepted would be donated to the City to be maintained and operated.
- The master meter and vault assembly would be donated to CRW to be maintained and operated.
- Evergreen Housing Development shall sign a "Developer's Agreement "with CRW.

In conclusion, CRW is willing to work with Evergreen Housing Development on the development of a water system that would provide domestic water from the Beavercreek Pressure Zone to the referenced site. If you have any additional questions or comments please do not hesitate to call (503-722-9228).

Respectfully,

Robert C. George

Robert C. George, P.E.
District Engineering, Clackamas River Water

CC: CRW Chron file
Engineering files – Evergreen Housing (3-ring file)

Beavercreek Road LLC
600 University St, Suite 1708
Seattle, WA 98101
206-535-6348

August 18, 2014

Bob George
Clackamas River Water District
16770 SE 82nd Dr. #100
Clackamas, OR 97015

RE: Request for Water Service at 19896 Beavercreek Road, Oregon City, OR

Bob,

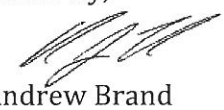
I am writing today as the representative for Beavercreek Road LLC, the owner of an approximately 11 acre parcel of land at 19896 Beavercreek Road in Oregon City and land use applicant to develop approximately 186 units of multi-family rental housing on this same site.

It has come to our attention that the City of Oregon City may have difficulty providing adequate water service to meet the needs of our proposed development both for residential domestic water and possibly for fire services. Before our parcel was annexed to Oregon City it was under the jurisdiction of CRW. As such, it still has an abandoned water line running to it from the CRW pump station on Beavercreek Road.

I am writing to formally ask for exterritorial water service from CRW to supply our project. I would appreciate having a formal decision from the CRW board as soon as possible stating CRW's willingness to provide water services to our project.

I appreciate your time on this matter. Please let me know if I can clarify any questions you may have about our proposed project or this request for exterritorial service.

Sincerely,



Andrew Brand
Authorized Representative
Beavercreek Road LLC
andrew@evergreenhd.com

Oregon City Live/Work
Evergreen Housing Development Group

11/10/2014

Parking Area Breakdown

Beavercreek Road On-Street	0	
Meyers Road On-Street	17	
Street A – On-Street	27	**
Street B – On-Street Parallel	18	**
Street B – On-Street 90 degree	7	**
Bldgs T1-T7 (one car garages)	33	
Bldgs T1-T7 (aprons)	33	**
Bldg C1 lot	17	
Alley Loop A	40	**
Alley Loop B	61	**
Alley Loop C	78	**
Total	**331**	**

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

NOTICE OF LIMITED LAND USE APPLICATION
Mailed on July 24th, 2014

COMMENT DEADLINE:	Written comments on this Type II application must be received by the Oregon City Planning Division no later than **5:00 pm, Monday, August 11th, 2014**
FILE NUMBER:	SP 14-01: Site Plan and Design Review
APPLICANT:	Beavercreek Road, LLC, Attn: Andrew Brand 600 University Street, Ste. 1708, Seattle, WA 98101
OWNER:	Same as Applicant
REPRESENTATIVE:	Same as Applicant
REQUEST:	Site Plan and Design Review for a 121-unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1)
LOCATION:	19896 Beavercreek Rd, Oregon City OR 97045 Clackamas County Map 3-2E-10C Tax Lot 800
CONTACT PERSON:	Peter Walter AICP, Associate Planner (503) 496-1568
NEIGHBORHOOD ASSOCIATION:	Caufield Neighborhood Association
CRITERIA:	• Oregon City Municipal Code. The City Code Book is available on-line at www.orcity.org • Administration and Procedures in Chapter 17.50; • "MUC-1" – Mixed Use Corridor District in Chapter 17.29; • Streets, Sidewalks and Public Places in Chapter 12.04; • Public and Street Trees in Chapter 12.08; • Site Plan and Design Review in Chapter 17.62; • Multi-Family Design Standards in Section 17.62.057; • Water Service System in Chapter 13.04; • Sewer Regulation in Chapter 13.08; • Stormwater Management in Chapter 13.12; • Off-Street Parking and Loading in Chapter 17.52

The application and all supporting documents submitted by or on behalf of the applicant are available for inspection at no cost at the Oregon City Planning Division, 221 Molalla Ave., Ste. 200, during regular business days (8 am - 5 pm). Copies of these materials may be obtained for a reasonable cost. Any interested party may submit written comments prior to the issuance of the Community Development Director's decision. Written comments must be received at the Planning Department no later than the close of business on **5:00 pm, August 11th, 2014** to be considered by the Community Development Director. The Community Development Director's decision will be based on the applicant's submittal, departmental and agency comments, letters from the public, and available information applicable to the criteria. Notice of the decision shall be sent to the applicant and to those persons submitting comments and providing a return address. Please be advised that any issue that is intended to provide a basis for appeal must be raised in writing during the 14-day comment period with sufficient specificity to afford the City and the parties an opportunity to respond to the issue. Failure to raise an issue on the record with sufficient specificity and accompanied by statements or evidence sufficient to afford the City to respond to the issue, will preclude any appeal on that issue. The Community Development Director's decision may be appealed to the City Commission by parties with standing. Any appeal will be based on the record.

A city-recognized neighborhood association requesting an appeal fee waiver 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 pursuant to OCMC 17.50.190(C)(5) to and 17.50.290(C).

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

NOTICE OF LIMITED LAND USE APPLICATION (SECOND NOTICE)

Mailed on October 17, 2014

COMMENT DEADLINE:	Written comments on this Type II application must be received by the Oregon City Planning Division no later than **5:00 pm, Friday, October 31st, 2014**
FILE NUMBER:	SP 14-01: Site Plan and Design Review
APPLICANT:	Beavercreek Road, LLC, Attn: Andrew Brand 600 University Street, Ste. 1708, Seattle, WA 98101
OWNER / REP:	Same as Applicant
REQUEST:	Site Plan and Design Review for a 121-unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1) -
LOCATION:	19896 Beavercreek Rd, Oregon City OR 97045 Clackamas County Map 3-2E-10C Tax Lot 800
PROJECT WEBSITE:	Application materials may be downloaded at http://www.orcity.org/planning/landuse
CONTACT PERSON:	Peter Walter AICP, Associate Planner (503) 496-1568
NEIGHBORHOOD ASSOCIATION:	Caufield Neighborhood Association
CRITERIA:	• Oregon City Municipal Code. The City Code Book is available on-line at www.orcity.org • Administration and Procedures in Chapter 17.50; • "MUC-1" – Mixed Use Corridor District in Chapter 17.29; • Streets, Sidewalks and Public Places in Chapter 12.04; • Public and Street Trees in Chapter 12.08; • Site Plan and Design Review in Chapter 17.62; • Multi-Family Design Standards in Section 17.62.057; • Water Service System in Chapter 13.04; • Sewer Regulation in Chapter 13.08; • Stormwater Management in Chapter 13.12; • Off-Street Parking and Loading in Chapter 17.52

The application and all supporting documents submitted by or on behalf of the applicant are available for inspection at no cost at the Oregon City Planning Division, 221 Molalla Ave., Ste. 200, M-F, 8:30 am – 3:30 pm. Copies of these materials may be obtained for a reasonable cost. Any interested party may submit written comments prior to the issuance of the Community Development Director's decision. Written comments must be received at the Planning Department no later than the close of business on **5:00 pm, October 31st, 2014** to be considered by the Community Development Director. The Community Development Director's decision will be based on the applicant's submittal, departmental and agency comments, letters from the public, and available information applicable to the criteria. Notice of the decision shall be sent to the applicant and to those persons submitting comments and providing a return address. Please be advised that any issue that is intended to provide a basis for appeal must be raised in writing during the 14-day comment period with sufficient specificity to afford the City and the parties an opportunity to respond to the issue. Failure to raise an issue on the record with sufficient specificity and accompanied by statements or evidence sufficient to afford the City to respond to the issue, will preclude any appeal on that issue. The Community Development Director's decision may be appealed to the City Commission by parties with standing. Any appeal will be based on the record.

A city-recognized neighborhood association requesting an appeal fee waiver 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 pursuant to OCMC 17.50.190(C)(5) to and 17.50.290(C).

From:	Tony Konkol
To:	Pete Walter
Subject:	FW: Beavercreek Rd LLC SP14-01
Date:	Monday, August 04, 2014 12:27:28 PM

Hi Pete,
The following public comments were submitted for the project on Beavercreek Road.
Thanks,
Tony

From: wshfish@aol.com [mailto:wshfish@aol.com]
Sent: Thursday, July 31, 2014 11:38 AM
To: Tony Konkol
Subject: Beavercreek Rd LLC SP14-01

Dear Mr. Konkol:

We are writing in regards to the proposed development for 19896 Beavercreek Rd. We attended the Evergreen Development meeting last summer and want to reiterate our concerns from the information provided last August.

We live across the street from the proposed apartments and are quite concerned about the considerable increase in traffic that will arise from the 183 planned units. Obviously a left turn lane will be needed at Myers, but will Beavercreek also be widened to accommodate these 200-400 more cars? Using Maple Lane as an example, that turn lane is often backed up 10-15 cars obstructing thru traffic on Beavercreek, but the two lanes help alleviate the congestion.

Our other main concern is the live-work units and their proposal of units fronting Beavercreek with on street parking. Again, we do not see A) how Beavercreek will be wide enough to accommodate on street parking and/or B) how cars will safely be able to pull out onto Beavercreek at the current posted speeds (and also slight uphill grade causing a blind spot). Also, will cars be allowed to park on both sides of Beavercreek? How much traffic will also spill onto Meyers for scrapbooking parties or a fitness class (these were suggested uses made by developer at previous meeting).

An additional parking concern is even though the developers claim they'll provide a parking space for each bedroom in the complex, where will guests, (customers?) or 2 car couples living in a 1 bedroom unit park?? Our property backs to Meyers and we are worried we will have even less privacy and increased noise with all these extra cars and no available parking for them in their own complex.

A final concern is the ability of the city to provide adequate water pressure to all these new residences when our current water pressure is already quite low. Will our water pressure decrease even further?

While development is inevitable, it would be much more appealing if single family homes could be built on this site. If this mixed use development must be permitted, we would hope the City would see fit to significantly reduce the number of units allowed (by half?) and require more parking/garages with no on street parking outside of the development.

Thank you for considering our concerns.

Ron & Wendy Carter
15035 Emerson Ct
Oregon City OR 97045

Oregon City Planning Department
221 Molalla Ave.
Suite 200
Oregon City, OR 97045
Attention: Peter Walter, Associate Planner

RE: Beavercreek Road Site Plan SP 14-01

Dear Pete:

Thank you very much for meeting with Gary Davis and me on Wednesday to discuss the Beavercreek Road Project, SP 14-01. We appreciate all of the time and effort you put forth on this spur of the moment meeting.

This letter represents the formal response from the Caufield Neighborhood Association on SP 14-01.

We have several concerns about the size, scope and safety of this project.

1. As we discussed, I believe that the size and scope of this project presents a significant safety issue considering that it is located near an unregulated airport. Since there are no paved runways, runway lights or manned personnel, it is very difficult to determine how many planes land before it is safe to do so and how many planes go beyond the recommended distance to be airborne. Therefore, the number of residents in this area, expected to reach 550 people would constitute a considerable safety issue

2. Initially, we believed that the concept for this project was light industrial that would bring employment to the community, especially for students that attend Clackamas Community College and to a lesser degree, Oregon City High School. However, SP 14-01 has 183 units of which 62 are live work units. Needless to say, these stores are so small that it should be considered small family businesses, which would employ maybe 1 or 2 people in addition to the owner/operator.

3. Since the number of resident to live in this project is 550 people, it is anticipated that the number of vehicles in the complex will be over 800. This does not include the number of vehicles that will be in the vicinity for business purposes. The Caufield Neighborhood Association is still reeling from the miscalculation the City had regarding the parking and traffic in the Landing, an apartment complex located on Glen Oaks Road. The home owners in the Caufield Neighborhood Association are having to put up with the residents of the Landing parking in front of their house, which prohibits the residents of these houses from parking near their homes. Additionally, several people have complained that residents of the Landing are parking in front of their mailboxes. These actions result in the U.S.P.S. from delivering mail the residents.

I can assure you that the residents and/or customers of the project will use the Oregon City High School parking lot to park their vehicles during the day, conduct business and/or after school hours. I am positive the high school would not be amenable to this use.

4. There are no plans to widen Beavercreek road from a 2 lane to a 4 lane between Glen Oak Road and Maple Lane. The reason to widen Beavercreek Road is obvious. Since there are going to be an estimated 800 more vehicles in the area, the road is not wide enough to handle that capacity.

5. According to our discussion, a significant issue exists with the connecting the proposed sewer line in the area. According to you, this has to be resolved before any construction can occur. Of course, the major issue is the cost. It would be unrealistic to make a connection to a smaller sewer because of the cost.

6. Finally, it has been brought to our attention by Elizabeth Graser-Lindsey, that Oregon City and SP 14-01 is not in compliance with the Beavercreek Concept Plan. You stated in our conversation that SP 14-01 was included in the project prior to the Concept Plan. However, I do not have any documentation showing that this was the case. Therefore, I included a copy of Elizabeth's comments for you to address. Although Elizabeth does not reside within the Caufield Neighborhood Association boundaries, she does raise some significant issues which can have a significant impact on us.

If you have any comments or concerns, please feel free to contact me.

Sincerely,

Mike Mermelstein
Chairman Caufield Neighborhood Association

Public Comment on Land Use Application
SP 14-01: Site Plan and Design Review
for 121-Unit Apartments and 62-Live-Work Units on 9.7 acres
(Zoned MUC-1) – East Side of Beavercreek Rd.

TO: Attn: Pete Walter (503) 496-1568

FROM: Elizabeth Graser-Lindsey

DATE: Aug, 2, 2014

1. This urbanization project cannot go forward until a Beavercreek Rd. Concept Plan is adopted that isn't remanded by the review court. Graser-Lindsey v. City of Oregon City, 58 Or LUBA 703 (2009) i.e. LUBA 2008-170. Since the Beavercreek Rd. Concept Plan has not been adopted in a valid form, this urbanization and land use project (site plan and design review) cannot go forward at this time. Various Oregon City and Metro laws require the type of planning and analysis that occurs in concept planning such as determining if infrastructure and public services are available and determining how they will be paid for and ensuring that the services of current city residents will not be degraded. These steps have not been completed and the legal requirements have not been fulfilled.

When this property was annexed into Oregon City (see attached maps), LUBA agreed that the annexation could proceed the concept plan with the understanding that the concept plan would proceed urbanization. This is explained in LUBA's final order and opinion numerous times. For example,

> "The city concedes that the Metro Code and the OCCP require that the Beavercreek Road Concept Plan must be adopted before the annexed territory can be planned and zoned in a manner that would allow the annexed property to be developed with urban uses." p. 13-14.
>
> "The underlying purpose of OCCP Goal 14.4 and related city and Metro provisions appears to be to ensure that (1) a concept plan will

procede actual urbanization of the annexed areas, (2) concept plans will provide the basis for planning and zoning of annexed areas for urban development, and (3) adequate and sufficient public facilities are extended to annexed areas as they urbanize in a way that does not financially burden or adversely affect public facilities and services in other parts of the city. As we have explained elsewhere in this opinion, the city took steps to ensure that urbanization cannot occur until the Beavercreek Road Concept Plan has been completed. The Beavercreek Rd. Concept Plan planning process must address public facility impacts of urbanization." p. 20.

"We [LUBA] understand the city to argue [and this necessary argument allowed LUBA to let the annexation to proceed adoption of the concept plan] that since (1) annexation, in and of itself, authorizes no additional urban development of the annexed property, ...(3) no urban development will be possible before the Beavercreek Road Concept Plan is adopted and necessary comprehensive plan and zoning amendments are adopted to allow urbanization of the annexed area, and (4) the Beavercreek Road Concept Plan will be required to address the public facilities and services that will be needed for urbanization of the plan area, the city's findings that recognize and point out these facts are sufficient to 'consider' the 'relevant factors' set out in OCCMC 14.04.060(A). We conclude that the decision includes the above-described implied interpretation of OCMC 14.04.060(A)." p.24.

Graser-Lindsey, Kehoe and Kosinski v. City of Oregon City and Jacobson. LUBA 2007-171.

2. There was extensive public comment and infrastructure studies during the concept plan process that provided evidence that the infrastructure, public facilities and services could not serve this property without degrading these facilities and services for other city residents. (See attached Petitioner's brief in Graser-Lindsey v. City of Oregon City, 58 Or LUBA 703 (2009) i.e. LUBA 2008-170 elaborating on these points). These deficiencies have not been corrected.

Beavercreek Rd., for example, is 2-lanes, has heavy traffic loads and is projected to fail in the next 20 years at various intersections according to Clackamas County's analysis for its Transportation System Plan which concluded in early 2014. That TSP analysis also showed Hwy 213 failing through Newell Creek Canyon and I205 failing in this vicinity. How are these and existing residents to move about without impairment. How will this development add to development in the Park Place Concept Plan area which also impacts Hwy 213 and feeds onto I205.

The public also has not been able to comment on the area plan.

3. In the absence of a final concept plan, the proposed development is unable to interface with the rest of the area in the concept plan such as roads, other infrastructure and building type. Using the remanded concept plan would not work, because LUBA recognized mis-zoning of the industrial land, which, went corrected, would inevitably lead to changes in the areas configuration such as road network and adjacent land uses.

4. These densities (i.e. 183 units on under 10 acres) look like the type that Metro favors along a light rail line to create a dense urban neighborhood. As proposed, this development plan is not near public transportation nor near similar or compatible uses and is sitting inharmoniously on the rural fringe. The remanded concept plan projected light vehicle use due special green assumptions and as a result projected light impacts on the road network as ODOT's reviewer questioned; this development appears to be motor vehicle focused and to be negatively impactful on the area. The density issue is likely to affect other public facilities and services, but this has not been studied.

5. While the city is to plan new lands, it appears that piecemeal development is the approach. This does not comply with Metro or OC ordinances and it does not comply with Metro time requirements for planning.

OREGON CITY
Community Development - Planning
221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

NOTICE OF LIMITED LAND USE APPLICATION
Mailed on July 24th, 2014

COMMENT DEADLINE:	Written comments on this Type II application must be received by the Oregon City Planning Division no later than **5:00 pm, Monday, August 11th, 2014**
FILE NUMBER:	SP 14-01: Site Plan and Design Review
APPLICANT:	Beavercreek Road, LLC, Attn: Andrew Brand 600 University Street, Ste. 1708, Seattle, WA 98101
OWNER:	Same as Applicant
REPRESENTATIVE:	Same as Applicant
REQUEST:	Site Plan and Design Review for a 121-unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1)
LOCATION:	19896 Beavercreek Rd, Oregon City OR 97045 Clackamas County Map 3-2E-10C Tax Lot 800
CONTACT PERSON:	Peter Walter AICP, Associate Planner (503) 496-1568
NEIGHBORHOOD ASSOCIATION:	Caufield Neighborhood Association
CRITERIA:	• Oregon City Municipal Code. The City Code Book is available on-line at www.orcity.org • Administration and Procedures in Chapter 17.50; • "MUC-1" – Mixed Use Corridor District in Chapter 17.29; • Streets, Sidewalks and Public Places in Chapter 12.04; • Public and Street Trees in Chapter 12.08; • Site Plan and Design Review in Chapter 17.62; • Multi-Family Design Standards in Section 17.62.057; • Water Service System in Chapter 13.04; • Sewer Regulation in Chapter 13.08; • Stormwater Management in Chapter 13.12; • Off-Street Parking and Loading in Chapter 17.52

The application and all supporting documents submitted by or on behalf of the applicant are available for inspection at no cost at the Oregon City Planning Division, 221 Molalla Ave., Ste. 200, during regular business days (8 am - 5 pm). Copies of these materials may be obtained for a reasonable cost. Any interested party may submit written comments prior to the issuance of the Community Development Director's decision. Written comments must be received at the Planning Department no later than the close of business on **5:00 pm, August 11th, 2014** to be considered by the Community Development Director. The Community Development Director's decision will be based on the applicant's submittal, departmental and agency comments, letters from the public, and available information applicable to the criteria. Notice of the decision shall be sent to the applicant and to those persons submitting comments and providing a return address. Please be advised that any issue that is intended to provide a basis for appeal must be raised in writing during the 14-day comment period with sufficient specificity to afford the City and the parties an opportunity to respond to the issue. Failure to raise an issue on the record with sufficient specificity and accompanied by statements or evidence sufficient to afford the City to respond to the issue, will preclude any appeal on that issue. The Community Development Director's decision may be appealed to the City Commission by parties with standing. Any appeal will be based on the record.

A city-recognized neighborhood association requesting an appeal fee waiver 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 pursuant to OCMC 17.50.190(C)(5) to and 17.50.290(C).

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

LAND USE APPLICATION TRANSMITTAL

July 24, 2014

CITY STAFF DISTRIBUTION	*MAIL-OUT DISTRIBUTION*
☐ BUILDING OFFICIAL	☐ NEIGHBORHOOD ASSOCIATION _Caufield ✓
☐ DEVELOPMENT SERVICES MANAGER ✓	☐ NATURAL RESOURCES COMM. (NRC)
☐ PUBLIC WORKS- OPERATIONS ✓	☐ CLACKAMAS COUNTY TRANSP. & PLANNING ✓
☐ CITY ENGINEER ✓	☐ CLACKAMAS FIRE DISTRICT #1 ✓
☐ PUBLIC WORKS DIRECTOR	☐ ODOT – Division Review
☐ TECHNICAL SERVICES (GIS) ✓	☐ OREGON CITY SCHOOL DISTRICT ✓
☐ PARKS MANAGER	☐ TRI-MET ✓
☐ ADDRESSING	☐ METRO
☐ POLICE ✓	☐ OREGON CITY POSTMASTER
TRAFFIC ENGINEER	☐ DLCD
☐ REPLINGER AND ASSOCIATES ✓	☐ CITY ATTORNEY
	☐ OTHER: _____
Mailed Notice to County CPO's	
☐ Central Pt-New Era-Leland / Holcomb-Outlook/Beavercreek ✓	
Mailed Notice	
☐ Within 300' ✓	

PUBLIC COMMENTS DUE:	6:00 p.m., August 11, 2014
REVIEW COMMENTS DUE:	6:00 PM, August 25, 2014
HEARING DATE:	Type II – Not applicable
HEARING BODY:	_XX_ **Staff Review;** _____PC; _____CC
FILE # & TYPE:	SP 14-01: Site Plan and Design Review for a 121-unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1) – East side of Beavercreek Road
PLANNER:	Pete Walter, AICP, Planner (503) 496-1568
PROJECT WEBSITE:	http://www.orcity.org/planning/landusecase/sp-14-01-beavercreek-road-apartments-live-work-units
APPLICANT:	Beavercreek Road, LLC, Attn: Andrew Brand
LOCATION:	19896 Beavercreek Rd, Oregon City OR 97045 (See Vicinity Map on Public Notice) Clackamas County Map 3-2E-10C Tax Lot 800

This application material is referred to you for your information, study and official comments. If hard copies are required, please contact the Planning Department. Your recommendations and suggestions will be used to guide the Planning staff when reviewing this proposal. If you wish to have your comments considered and incorporated into the staff report, please return the attached copy of this form to facilitate the processing of this application and ensure prompt consideration of your recommendations.

Please check the appropriate spaces below. Attach additional pages if needed.

_____ The proposal does not conflict with our interests.

__X__ The proposal conflicts with our interests for the reasons stated below.

_____ The proposal would not conflict our interests if the changes noted below are included.

see attached

Signed Carina da Silveira 08/08/2014

Title Property owner

PLEASE RETURN YOUR COPY OF THE APPLICATION AND MATERIAL WITH THIS FORM.

August 8, 2014

Carina DeOliveira
15550 S. Old Acres Lane
Oregon City, OR
97045

Oregon City Community Development
SP 14-01
Pete Walker AICP Planner
221 Molalla Ave #200
Oregon City, Oregon 97045

Dear Sir,

I wish to file my opposition to the development at 19896 Beavercreek Road, Oregon City. This property, near the already busy Community College, cannot support further stress on the existing traffic situation. During the school year, cars transporting students to and from the Oregon City High School and CCC stack up at this part of Beavercreek Road. Non student-connected residents are forced to face this back up on a daily basis.

Adding 112 units of apartments, each one with at least one car, will make a bad situation so much worse. It is my understanding that this area of Beavercreek Road is zoned for industrial use, not residential.

There is no traffic signal at the corner of Glen Acres and Beavercreek Roads. It is impossible to make a left turn from Glen Acres onto Beavercreek during high peak traffic times. Hundreds of apartment-type housing units already exists off Glen Acres Road along the back side of Oregon City High School. Is further development of high density housing really needed in our area? Can Beavercreek, as only a two-lane in and out access road support added cars and congestion? Those of us who moved here some time ago for the tranquility of Oregon City are asking you to NOT turn the Beavercreek Road Community into Beaverton.

Please keep the area in question zoned industrial, as it is, and consider the opinions of the people who live in this community.

Thank you,

Carina DeOliveira
carinad@bctonline.com
503 313-2140

Attn Peter Walker
City of Oregon City
221 Molalla Ave Suite 200
Oregon City, OR 97045

✓ Postmark August 6, 2014

PW

Public Comment on Land Use Application
SP 14-01: Site Plan and Design Review
for 121-Unit Apartments and 62-Live-Work Units on 9.7 acres
(Zoned MUC-1) – East Side of Beavercreek Rd.

TO: Attn: Pete Walter (503) 496-1568

FROM: Elizabeth Graser-Lindsey

DATE: Aug. 6, 2014

1. This urbanization project cannot go forward because this urbanization and land use project (site plan and design review) requires a valid concept plan according to LUBA'S Final Opinion and Order in Graser-Lindsey, Kehoe and Kosinski v. City of Oregon City and Jacobson. LUBA 2007-171, but the Beavercreek Rd. Concept Plan was remanded by the review court and the remanded concept plan has not been reworked into and adopted as a valid concept plan. Graser-Lindsey v. City of Oregon City, 58 Or LUBA 703 (2009) i.e. LUBA 2008-170. AH. 3 AH. #2

When this property was annexed into Oregon City (see attached maps), in its review LUBA agreed that the annexation could proceed the concept plan with the understanding that the concept plan would proceed urbanization. This is explained in LUBA's final order and opinion numerous times. For example, AH. #1

> "The city concedes that the Metro Code and the OCCP require that the Beavercreek Road Concept Plan must be adopted before the annexed territory can be planned and zoned in a manner that would allow the annexed property to be developed with urban uses." p. 13-14.
>
> "The underlying purpose of OCCP Goal 14.4 and related city and Metro provisions appears to be to ensure that (1) a concept plan will procede actual urbanization of the annexed areas, (2) concept plans will provide the basis for planning and zoning of annexed areas for

urban development, and (3) adequate and sufficient public facilities are extended to annexed areas as they urbanize in a way that does not financially burden or adversely affect public facilities and services in other parts of the city. As we have explained elsewhere in this opinion, the city took steps to ensure that urbanization cannot occur until the Beavercreek Road Concept Plan has been completed. The Beavercreek Rd. Concept Plan planning process must address public facility impacts of urbanization." p. 20.

"We [LUBA} understand the city to argue [and this necessary argument allowed LUBA to let the annexation to proceed adoption of the concept plan] that since (1) annexation, in and of itself, authorizes no additional urban development of the annexed property, ...(3) no urban development will be possible before the Beavercreek Road Concept Plan is adopted and necessary comprehensive plan and zoning amendments are adopted to allow urbanization of the annexed area, and (4) the Beavercreek Road Concept Plan will be required to address the public facilities and services that will be needed for urbanization of the plan area, the city's findings that recognize and point out these facts are sufficient to 'consider' the 'relevant factors' set out in OCCMC 14.04.060(A). We conclude that the decision includes the above-described implied interpretation of OCMC 14.04.060(A)." p.24.

In addition to LUBA's pertinent decision specific to this property, various Oregon City and Metro laws require the type of planning and analysis that occurs in concept planning such as determining if infrastructure and public services are available and determining how they will be paid for and ensuring that the services of current city residents will not be degraded. These steps have not been completed and the legal requirements have not been fulfilled.

2. There was extensive public comment and infrastructure studies during the concept plan process that provided evidence that the infrastructure, public facilities and services could not serve this property without degrading these facilities and services for other city residents. (See attached

Petitioner's Brief in Graser-Lindsey v. City of Oregon City, 58 Or LUBA 703 (2009) i.e. LUBA 2008-170 elaborating on these points particularly in Assignment of Error 2). These deficiencies have not been corrected.

Beavercreek Rd., for example, is 2-lanes, has heavy traffic loads and is projected to fail in the next 20 years at various intersections according to Clackamas County's analysis for its Transportation System Plan which concluded in early 2014. That TSP analysis also showed Hwy 213 failing through Newell Creek Canyon and I 205 failing in this vicinity. How are these and existing residents to move about without impairment? How will this development add to development in the Park Place Concept Plan area which also impacts Hwy 213 and feeds onto I205?

Building this development would tightly restrict widening of Beavercreek Rd. and so future accommodation of the heavy traffic loads would become very expensive (to move back the 4-story building within 10 ft of the road) or impossible. The development narrows Beavercreek Rd. somewhat (because the sidewalk subtracts from the lane of travel and bike lane as they currently exist) when the road is already very narrow for the loads it is carrying.

Street-side parking along Beavercreek Rd. would cause great traffic slowdowns on this heavily-used arterial. Commuters would get caught up in retail (as implied by live/work) traffic. During earlier planning it was not envisioned that a strip mall would be created (and one without adequate parking); rather, a community was envisioned. It was claimed that the neighborhood would not be automobile focused, but this retail is focused on Beavercreek Rd.

The development does not propose to utilize a concept-plan sized sewage solution (building sewage line the mile down Beavercreek Rd.), but instead to do a piecemeal use of the Glen Oak neighborhood's capacity.

The public also has not been able to comment on the area plan.

3. In the absence of a final concept plan, the proposed development is unable to interface with the rest of the area in the concept plan such as

roads, other infrastructure and building type. Using the remanded concept plan would not work, because LUBA recognized mis-zoning of the industrial land, which, went corrected, would inevitably could lead to changes in the whole area's configuration such as road network and adjacent land uses.

4. These densities (i.e. 183 units on under 10 acres) look like the type that Metro favors along a light rail line to create a dense urban neighborhood. As proposed, this development plan is not near public transportation nor near similar or compatible uses and is sitting inharmoniously on the rural fringe.

The remanded concept plan projected light vehicle use due special green assumptions and as a result projected light impacts on the road network as ODOT's reviewer questioned; this development appears to be motor vehicle focused and to be negatively impactful on the area e.g. Hwy 213 and I 205. The density issue is likely to affect other public facilities and services, but this has not been studied.

5. While the city is to plan new lands, it appears that piecemeal development is the approach. This does not comply with Metro or OC ordinances and it does not comply with Metro time requirements for planning e.g. Metro's time line for planning to be completed.

AN 07-02

City of Oregon City
P.O. Box 3040
320 Warner Milne Rd
Oregon City, OR 97045
(503) 657-0891
www.orcity.org

Map created with OCMap 2006

05/29/2007

LUBA 2007-171 Record Page Exhibit 442

#2

BEFORE THE LAND USE BOARD OF APPEALS

OF THE STATE OF OREGON

ELIZABETH A. GRASER-LINDSEY,
Petitioner,

and

KATHERINE KEHOE and CHRISTINE KOSINSKI,
Intervenor-Petitioners,

vs.

CITY OF OREGON CITY,
Respondent,

and

PATTY JACOBSON,
Intervenor-Respondent.

LUBA No. 2007-171

FINAL OPINION
AND ORDER

Appeal from City of Oregon City.

Elizabeth Graser-Lindsey, Beavercreek, filed a petition for review and argued on her own behalf.

Christine Kosinski, Oregon City, filed a petition for review on her own behalf.

Katherine Kehoe, Oregon City, represented herself.

Edward J. Sullivan and Carrie Richter, Portland, filed the response brief and Edward J. Sullivan argued on behalf of respondent. With them on the brief was Garvey Schubert Barer.

Patty Jacobson, Lake Oswego, represented herself.

HOLSTUN, Board Member; RYAN, Board Chair; BASSHAM, Board Member, participated in the decision.

AFFIRMED 05/07/2008

You are entitled to judicial review of this Order. Judicial review is governed by the provisions of ORS 197.850.

Opinion by Holstun.

NATURE OF THE DECISION

Petitioners appeal a city resolution that approves a petition to annex 122 acres to the city. The resolution also refers the proposed annexation to city voters.[1] The annexation apparently was approved by city voters in November 2007.

FACTS

The Metropolitan Service District (Metro) included the 122-acre area that is the subject of this appeal within the urban growth boundary (UGB) in 2002. The disputed annexation was initiated by a petition of 100 percent of the owners owning 100 percent of subject area. Record 668-75. At the time the 122 acres were annexed, the area was developed with five single-family residences and an airport and had a total population of nine people.

The 122 acres were included in the UGB by Metro to provide additional urban land for industrial development. At the time the subject property was included in the UGB, it was outside city limits and was designated Low Density Residential by the Clackamas County Comprehensive Plan and was zoned Future Use Zone (FU-10) by the county. The FU-10 zone is a holding zone, which imposes a 10-acre minimum lot size. The city is in the process of developing and adopting the Beavercreek Road Concept Plan for an area that includes the disputed 122-acre area. That concept plan will provide the basis for new city comprehensive plan and zoning map designations for the annexed area and other areas. Until that concept plan is completed and adopted, the findings that support Resolution 07-24 explain that the county FU-10 zoning will remain in place.

---

[1] The decision and its supporting findings are scattered in the record in a way that makes it unclear exactly what documents make up the decision on appeal. As far as we can tell, the challenged decision is made up of six documents: (1) Resolution 07-24 (Record 40-42); (2) a legal description of the annexed property (Record 43-44); (3) a map of the annexed property (Record 50); (4) City Commission Findings and Reasons (Record 46-49); (5); a notice of ballot title (Record 45); (6) Findings and Conclusions dated August 15, 2007 (Record 33-39).

In approving the disputed annexation, the city found that there are adequate public facilities to serve the now sparsely developed 122 acres and that the existing FU-10 holding zone is sufficient to ensure that any additional development that may occur before the Beavercreek Road Concept Plan is adopted will also be low density development that can be adequately served by existing public facilities. The city found that the Beavercreek Road Concept Plan that is currently being drafted will identify how the 122 acres will be planned and zoned for urban development and how that urban development will be provided the needed additional public facilities and urban infrastructure. The central dispute in this appeal is whether the city erred in annexing the 122 acres before the Beavercreek Road Concept Plan has been adopted. Although that question presents a relatively simple and straightforward legal dispute, the parties have managed to make it a much more complicated dispute.

MOTIONS

Petitioner's 50-page petition for review was filed on February 6, 2008. The city's 24-page response brief was filed on February 27, 2008. Petitioner's reply brief was filed on March 28, 2008. Oral argument in this appeal was held on April 3, 2008. That reply brief claims to be nine pages long, but the 16-page appendix is in reality additional reply brief argument. The reply brief is actually approximately 25 pages long.

Under OAR 661-010-0039 a request to file a reply brief and a reply brief are to be filed "as soon as possible after respondent's brief is filed."[2] The reply brief is to be limited "new matters raised in the respondent's brief." In addition, the reply brief is not to "exceed

---

[2] OAR 661-010-0039 provides:

> "A reply brief may not be filed unless permission is obtained from the Board. A request to file a reply brief shall be filed with the proposed reply brief together with four copies as soon as possible after respondent's brief is filed. A reply brief shall be confined solely to new matters raised in the respondent's brief. A reply brief shall not exceed five pages, exclusive of appendices, unless permission for a longer reply brief is given by the Board. A reply brief shall have gray front and back covers."

five pages, exclusive of appendices, unless permission for a longer reply brief is given by the Board." Petitioner's reply brief does not comply with any of these requirements.

The reply brief was filed 28 days after the respondent's brief was filed. The reply brief was filed and served by mail late in the day on Friday March 28, 2008, so that it was not received by LUBA or respondent until Monday March 31, 2008, three days before oral argument. Petitioner provides no explanation for the delay in filing the reply brief. Much of the reply brief does not respond to "new matters raised in the respondent's brief." Finally, the brief is 25 pages long, and petitioner does not offer any explanation for exceeding the 5 page limit by 20 pages. It does not appear to us that petitioner made any effort to keep the reply brief within the five-page limit or as short as possible.

Based primarily on petitioner's failure to timely file the reply brief and its length, at the beginning of oral argument in this appeal we partially granted respondent's motion to strike the reply brief. We allowed the parts of pages one and two of the reply brief that respond to respondent's waiver arguments and the six-page Appendix A that continues petitioner's response to respondent's waiver arguments. We granted respondent's motion to strike the remaining parts of the reply brief and the other reply brief appendices.

Because respondent had only three days before oral argument to prepare its written response to the 25-page reply brief, we allowed respondent additional time to file an additional written response to the part of petitioner's reply brief that we allowed. We advised respondent that the additional response should not exceed five pages. On April 10, 2008 respondent filed a five-page response to petitioner's response to the waiver arguments and petitioner's Appendix A.

On April 11, 2008, petitioner filed a motion to strike respondent's two responses to the reply brief. Alternatively, petitioner moved to allow petitioner's entire reply brief. Petitioner's April 11, 2008 motions are denied.

WAIVER

Under ORS 197.763(1) and 197.835(3), unless a petitioner at LUBA raised an issue before the respondent below, the petitioner may not assert that issue as a basis for reversal or remand on appeal to LUBA.[3] Respondent argues that petitioner and intervenor-petitioner (petitioners) waived almost all of the issues that are raised in their assignments of error. Petitioners do not argue that ORS 197.763(1) and 197.835(3) do not apply to the appealed decision. But petitioner does argue that all issues that are raised in the petition for review were adequately raised before the city.

ORS 197.763(1) and 197.835(3) require "fair notice to adjudicators and opponents, rather than the particularity that inheres in judicial preservation concepts." *Boldt. v. Clackamas County*, 107 Or App 619, 623, 813 P2d 1078 (1991). A petitioner adequately raises an issue under ORS 197.763(1) and 197.835(3) by citing the relevant legal standard, presenting argument that includes the operative terms of the legal standard, or taking other actions to raise the issue such that the city knows or should know that the issue is one that needs to be addressed in its decision. *Reagan v. City of Oregon City*, 39 Or LUBA 672, 690 (2001). In reviewing waiver arguments under ORS 197.763(1) and 197.835(3), LUBA relies on the party against whom a waiver defense is asserted to identify where in the record the disputed issue was raised. If the party against whom a waiver defense is asserted fails to cite evidence in the record that establishes that the disputed issue was raised below, LUBA will not consider the issue on appeal. *Cummins v. Washington County*, 22 Or LUBA 129, 137

---

[3] ORS 197.835(3) limits LUBA's scope of review when considering appeals of quasi-judicial land use decisions to issues that were raised in accordance with ORS 197.763(1). ORS 197.763 sets out statutory requirements of conducting quasi-judicial land use hearings. ORS 197.763(1) provides:

> "An issue which may be the basis for an appeal to the Land Use Board of Appeals shall be raised not later than the close of the record at or following the final evidentiary hearing on the proposal before the local government. Such issues shall be raised and accompanied by statements or evidence sufficient to afford the governing body, planning commission, hearings body or hearings officer, and the parties an adequate opportunity to respond to each issue."

(1991). Where a party does provide citations to the record in response to arguments that issues were not raised below, we review the cited portions of the record to determine whether the cited portions of the record demonstrate the city knew or should have known that the issue should be addressed in its decision. We address respondent's waiver arguments, and petitioner's response to those waiver arguments, under our discussion of the assignments of error and subassignments of error below.

FIRST ASSIGNMENT OF ERROR

The first assignment of error includes several subassignments of error, which we address separately below.

A. Oregon City Municipal Code (OCMC) 14.04.050 Annexation Procedures

OCMC 14.04.050 is entitled "Annexation Procedures." Petitioner's first subassignment of error concerns two subsections of OCMC 14.04.050. OCMC 14.04.050(C) states that annexation applicants are "encouraged to meet with the city-recognized neighborhood association or associations within which the property proposed to be annexed is located." OCMC 14.04.050(E) sets out a long list of things that must be included in an annexation application.

Petitioner contends that the city erred by treating the annexation application as complete, without requiring that the applicant comply with OCMC 14.04.050(C) and meet with neighborhood associations. Petitioner also argues the application is missing certain information that OCMC 14.04.050(E) requires to be included in an annexation application.

The city argues that petitioner waived the issues presented in this subassignment of error because no party raised any issue below regarding whether the application was deficient based on the applicant's failures to (1) meet with neighborhood associations or (2) submit an application that includes all of the information listed in OCMC 14.04.050(E).

Petitioner cites to testimony that was submitted to the city below questioning the adequacy of public facilities to serve the annexed area. Record 13-14, 158, 243-44 (Reply

Brief Appendix A – first unnumbered page). Petitioner recognizes that this testimony does not raise any issue regarding the application requirements under OCMC 14.04.050(C) and (E) but argues that its subassignment of error concerning OCMC 14.04.050(C) and (E) is a permissible elaboration of the broader issue that was raised below concerning the adequacy of public facilities to satisfy annexation approval standards.

Petitioner is correct that ORS 197.763(1) and 197.835(3) do not require that petitioner or other parties must have raised before the city "the identical" or "precisely the same" argument that is presented in subassignment of error A. *Hale v. City of Beaverton*, 21 Or LUBA 249, 254 (1991); *Boldt v. Clackamas County*, 21 Or LUBA 40, 46, *aff'd* 107 Or App 619, 813 P2d 1078 (1991). While the distinction between "issues" and "arguments" is somewhat imprecise, the *issue* that petitioners raised on the cited pages of the record (the alleged adequacy of public facilities to satisfy annexation approval standards) is not the same issue that is raised in petitioner's subassignment of error A (adequacy of the application to meet OMC 14.04.050(C) and (E) application requirements).

Petitioner did not raise the issue that is presented in the subassignment of error A, and that issue is waived.

B. The City Erred by Failing to Adopt a Concept Plan for the Area Before Annexing the Property

In subassignment of error B, petitioner argues that the city must adopt the Beavercreek Road Concept Plan before it approves the disputed annexation. We understand petitioner to advance three legal theories for why the city must adopt the Beavercreek Road Concept Plan before it approves the disputed annexation. First, petitioner argues that relevant annexation approval standards and contextual laws require that a concept plan be adopted before annexation. Second, petitioner contends that both the planning commission and city commission were uncomfortable proceeding with the annexation before the concept plan was adopted. Third, petitioner agues the proposed annexation cannot comply with the

city's comprehensive plan without a concept plan in place. We address each of petitioner's legal theories in support of subassignment of error B separately below.

1. Waiver

The city first argues the issue that is presented under subassignment of error B was not raised below. In response to the city's waiver argument, petitioner relies principally on the following testimony in the record to establish that the legal issue presented under this subassignment of error was raised below:

> "I also believe that when Metro regulated that areas within an Urban Growth Boundary could not develop until a Concept Plan was adopted, they did not mean for developers to take the initiative and seek annexation prior to Concept Plans being adopted. Metro Code states that the Commission's decision on this boundary change should be consistent with specific directly applicable standards or criteria for boundary changes contained in Comprehensive Land Use Plans, Public Facility Plans, etc. The Clackamas County Comprehensive Plan implements the Oregon City Comprehensive Plan for lands within the Urban Growth Boundary. The plan designations for these properties on the County's Oregon City Area Land Use Plan (Map IV-5) have not been updated to reflect the UGB expansion and the current designation of these properties are FU-10. If Map IV-5 needs to be updated once the Beavecreek Concept Plan is adopted, then these annexed areas currently do not meet the applicable zoning assignments, which can only be established upon adoption [of the] concept plans." Record 160.

Although the person presenting the above-quoted testimony certainly could have been clearer about her underlying legal theory for arguing that adoption of the Beavercreek Road Concept Plan must precede approval of the disputed annexation, we agree with petitioner that the above-quoted testimony is sufficient to raise the issue that is presented under the subassignment of error B, *i.e.*, whether the Beavercreek Road Concept Plan must be adopted before the disputed annexation can be approved.

We turn next to petitioner's three legal theories for why she believes the Beavercreek Road Concept Plan must be adopted before the annexation can be approved.

2. Examples of Metro Code, City Comprehensive Plan Requirements and OCMC Requirements

Petitioner first cites eleven "examples" of Metro Code, Oregon City Comprehensive Plan (OCCP) and OCMC requirements that she contends require that the Beavercreek Road Concept Plan be adopted prior to annexation. We address them separately below.

a. OCCP Page 118 (Examples 1 and 2)

Petitioner sets out text from the city comprehensive plan that describes what Title 11 of the Metro Code requires of cities when land is included in the UGB. That text also describes a number of things the city could and should do.[4] We agree with the city that nothing in the cited comprehensive plan text mandates prior approval of the Beavercreek Road Concept Plan before the disputed annexation could be approved. The closest the cited text comes to lending any support to petitioner's position is the part that states that one of Metro Code Title 11 purposes is met "by ensuring that concept plans are developed for areas proposed for urbanization or annexation." *See* n 4. But the quoted statement in the OCCP that an intent in Metro Code Title 11 is met by ensuring that concept plans are developed for areas proposed for urbanization or annexation imposes no legal requirement, by itself. Metro

---

[4] The cited text is as follows:

> "Title 11 requires cities to include the land within their Urban Growth Boundaries in their Comprehensive Plans prior to urbanizing that land. Title 11 intends to promote the integration of land added to the Urban Growth Boundary with existing communities by ensuring that concept plans are developed for areas proposed for urbanization or annexation. * * * Metro requires Oregon City to adopt concept plans for areas added to the Urban Growth Boundary.
>
> "Once inside the Urban Growth Boundary, areas can be proposed for annexation. * * * The City should consider its ability to adequately provide public facilities and services to an area * * *.
>
> "Rather than asking voters to approve property owners' requests to annex one at a time, the City should implement an annexation plan. The City could then annex large blocks of properties, with voter approval, rather than in a piecemeal fashion. Annexation would be tied more directly to the City's ability to provide services efficiently * * *. The zoning of the property should be considered when the Planning Commission and City Commission review the annexation request." OCCP 118.

Code Title 11 may impose such a requirement, but the quoted OCCP *description* of that requirement does not impose that requirement.

b. Metro Code 3.07.1120 (Example 3)

Petitioner next relies on Metro Code 3.07.1120.[5] Metro Code 3.07.1120 requires the city adopt comprehensive plan provisions for land that is included in the UGB and requires that the city comprehensive plan include a requirement that such land be annexed before it is allowed to urbanize. A Metro Ordinance that was adopted on December 5, 2002 gave cities four years to do so, but the city has not yet done so.

Metro Code 3.07.1120 is concerned with ensuring that annexation precedes urbanization. Like the city, we do not see that Metro Code 3.07.1120 says anything about whether the city may annex property before it adopts the required concept plan for such property.

c. OCMC 14.04.060(2) (Example 4)

OCMC 14.04.060 sets out seven "factors" the city must "consider" when deciding whether to approve an annexation request. *See* n 13. Factor OCMC 14.04.060(A)(2) is as follows:

"Conformity of the proposal with the city's comprehensive plan[.]"

---

[5] Metro Code 3.07.1120 provides, in part:

> All territory added to the UGB as either a major amendment or a legislative amendment pursuant to Metro Code Chapter 3.01 shall be subject to adopted comprehensive plan provisions consistent with the requirements of all applicable titles of the Metro Urban Growth Management Functional Plan * * *. The comprehensive plan provisions shall be fully coordinated with all other applicable plans. * * * *Comprehensive plan amendments shall include*:
>
> "* * * * *
>
> "B. *Provision for annexation to the district and to a city or any necessary service districts prior to urbanization of the territory*[.]" (Emphasis added).

In addressing OCMC 14.04.060(A)(2), the city found that "the City's Comprehensive Plan is satisfied or will be satisfied with the adoption of the Beavercreek Road Concept Plan * * *." Record 64.

Whatever the adequacy of the city's finding concerning annexation factor OCMC 14.04.060(A)(2), neither that finding nor OCMC 14.04.060(A)(2) itself operate to create a legal requirement that the Beavercreek Road Concept Plan be adopted before the disputed annexation is approved.

d. OCCP Policies 11.1.1 and 14.4.2 (Example 5)

OCCP Policy 11.1.1 is as follows:

> "Ensure adequate public funding for the following public facilities and services, if feasible[.]

OCCP Policy 14.4.2 is as follows:

> "Include an assessment of the fiscal impacts of providing public services to unincorporated areas upon annexation, including the costs and benefits to the city as a whole as a requirement for concept plans."[6]

The city's findings concerning OCCP Policy 11.1.1 took the position that the Beavercreek Road Concept Plan would address the public facility impacts of urban development of the annexed property. Record 58.

That finding may or may not be adequate to establish that the disputed annexation is consistent with OCCP Policy 11.1.1. But that is not the question presented under subassignment of error B. Neither Policy 11.1.1 nor Policy 14.4.2 impose a legal

---

[6] The quoted text of Policy 14.4.2 is taken from the copy of the City Comprehensive Plan that is available on the city's webpage. The text of Policy 14.4.2 set out at Record 63 is worded slightly differently and is set out below:

> "Concept Plans * * * for unincorporated areas within the Urban Growth Boundary shall include an assessment of the fiscal impacts of providing public services to the area upon annexation, including the costs and benefits to the city as a whole." Record 63.

requirement that the Beavercreek Road Concept Plan be adopted before the disputed annexation.

e. OCCP Policy 2.6.8 (Example 6)

OCCP Policy 2.6.8 is as follows:

> "Require lands east of Clackamas Community College that are designated as Future Urban Holding to be the subject of concept plans, which if approved as an amendment to the Comprehensive Plan, would guide zoning designations. The majority of these lands should be designated in a manner that encourages family-wage jobs in order to generate new jobs and move towards meeting the city's employment goals."

The subject property falls within the area described in the first clause of OCCP Policy 2.6.8. Petitioner argues that OCCP Policy 2.6.8 anticipates that the Beavercreek Road Concept Plan would be in place before annexation.

The city responds that although OCCP Policy 2.6.8 anticipates that the Beavercreek Road Concept Plan will be in place to guide *zoning* of the subject property that policy does not anticipate or require that the Beavercreek Road Concept Plan necessarily will be in place before the disputed area is *annexed*. Based on the text of OCCP Policy 2.6.8, we agree with the city.

f. OCMC 14.04.050(E) (Example 7)

OCMC 14.04.050(E) sets out the required contents of an annexation application. In several places OCMC 14.04.050(E) refers to the "anticipated development" and "proposed development." Petitioner argues the applicant proposes urban development in the annexed area and expresses concern that such development could occur before the Beavercreek Road Concept Plan is adopted.

The city responds that the FU-10 zone, which remains in place after the annexation, would not permit urban development of the annexed property. New comprehensive plan and zoning map designations will have to be adopted before the annexed property could be developed for urban uses. The city concedes that the Metro Code and the OCCP require that

the Beavercreek Road Concept Plan must be adopted before the annexed territory can be planned and zoned in a manner that would allow the annexed property to be developed with urban uses. However, we understand the city to argue that the requirement that the Beavercreek Road Concept Plan must be adopted before the subject property can be developed with urban uses has no bearing on whether the Beavercreek Road Concept Plan must be adopted before the subject property is *annexed.* We agree with the city.

g. OCCP Policy 14.4.3 (Examples 8 and 9)

OCCP page 118 explains that Metro Code Title 11 directs the city to adopt a Concept Plan to guide annexations. That page of the comprehensive plan also says the city "should" adopt an annexation plan. OCCP Policy 14.4.3 sets out certain considerations that may be relied upon to require that a proposed annexation be enlarged to include other properties.[7] Petitioner argues that without the Beavercreek Road Concept Plan the city cannot adopt and implement an annexation plan, and without the Beavercreek Road Concept Plan the city cannot require that adjacent parcels be included in the annexation.

As in other arguments petitioner presents under this subassignment of error and elsewhere in the petition for review, petitioner identifies OCCP and OCMC language that is consistent with having the Beavercreek Road Concept Plan in place before approving the disputed annexation. But that is not the same thing as citing language that *requires that* the Beavercreek Road Concept Plan be adopted before the disputed annexation. Nothing on

---

[7] OCCP Policy 14.4.3 provides:

> "Evaluate and in some instances require that parcels adjacent to proposed annexations be included to:
>
> "• avoid creating unincorporated islands within the city;
>
> "• enable public services to be efficiently and cost-effectively extended to the entire area; or
>
> "• implement a concept plan or sub-area master plan that has been approved by the Planning and City Commissions."

page 118 of the OCCP and nothing in the language of Policy 14.4.3 imposes a legal requirement that the Beavercreek Road Concept Plan must be adopted before any land that may be subject to the concept plan can be annexed.

h. OCMC 17.06.050 (Example 10)

OCMC 17.06.050 governs zoning of land that is annexed by the city and requires that the city apply a final zoning classification within 60 days after the property is annexed.[8] Petitioner's entire argument regarding this example is set out below:

> "The city is to designate the final zoning within 60 days of annexation. This can't happen without the Concept Plan being adopted." Petition for Review 12 (citations omitted).

The city responds that the county's FU-10 zoning is "final zoning," within the meaning of OCMC 17.06.050. The city contends that although the decision anticipates that zoning will change at the conclusion of the Beavercreek Road Concept Plan, that does not mean that the FU-10 zoning cannot constitute the "final zoning" that is required by OCMC 17.06.050.

We need not and do not decide here whether the city's plan to leave the county FU-10 zoning in place is consistent with OCMC 17.06.050.[9] The only question we must resolve under this subassignment of error is whether OCMC 17.06.050 establishes a legal

---

[8] OCMC 17.06.050 provides:

> "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 (as 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 17.06.050."

The referenced Table 17.06.050 shows the city zoning districts that correspond to various city comprehensive plan designations.

[9] If we were required to reach that question, the city's position that the *county* zoning that was applied to the property before it was annexed and continues to apply to the property qualifies as the "final zoning classification" that is required by OCMC 17.06.050 seems highly suspect. OCMC 17.06.050 seems clearly to envision application of the appropriate "city" zoning, not the "county" zoning that applied before annexation.

requirement that the Beavercreek Road Concept Plan be adopted before the disputed annexation. OCMC 17.06.050 clearly does not impose that requirement. OCMC 17.06.050 specifies action that the county must take *after* property is annexed; it says nothing about what a city must do *before* property is annexed or at the time property is annexed.

i. Bad Faith (Example 11)

We quote petitioner's eleventh example below:

> "When the application for annexation [precedes] adoption of the draft Concept Plan, which is already so close to adoption that the Planning and City Commissions are expecting it imminently, the applicant and City are placed in the position of racing the Concept Plan to adoption and of acting in bad faith as the term is understood in common law, which is fatal to the application. * * *" Petition for Review 12.

Petitioner's eleventh example provides no basis for concluding that prior adoption of the Beavercreek Road Concept Plan is legally required before the subject property can be annexed.

j. Conclusion

Some of petitioner's eleven examples of Metro Code, OCCP and OCMC requirements establish criteria that may be difficult or impossible to comply with because the Beavercreek Road Concept Plan was not adopted and in place before the disputed annexation was approved. But even if that is the case, that would simply mean that the annexation would have to be remanded if petitioner assigns error to the city's failure to demonstrate that the annexation complies with one or more applicable annexation approval criteria. Under this subassignment of error, petitioner makes a very different argument. That argument is that the examples establish the existence of a legal requirement that the city must adopt the Beavercreek Road Concept Plan before taking action to annex land that will be subject to the Concept Plan. Whether those examples are viewed separately or collectively, they simply do not impose that legal requirement.

3. City Commission and Planning Commission Discomfort with Approving the Annexation First

The second of petitioner's three legal theories for why she believes the Beavercreek Road Concept Plan must be adopted before the annexation can be approved is that the planning commission and city commission were uncomfortable with proceeding with the annexation before the Beavercreek Road Concept Plan was adopted.

That theory is without merit, and we reject it.

4. Other OCCP Goals and Policies

The third and final theory petitioner advances in support of subassignment of error B is not clear. That legal theory appears to be that additional OCCP Goals and Policies legally require the city to adopt the Beavercreek Road Concept Plan before the area that will be subject to that plan can be annexed. Some of the OCCP Goals and Policies that petitioner cites this final legal theory were previously cited under petitioner's first legal theory.

Setting out the text of all the OCCP Goals and Policies that petitioner cites here would needlessly lengthen and further complicate this opinion. None of the cited OCCP Goals and Policies supports petitioner's argument under subassignment of error B that the Beavercreek Road Concept Plan must be adopted before the city can annex the disputed 122 acres. Only three of the cited OCCP Goals and Policies, Goal 14.4 and Policies 14.4.2 and 14.4.3, specifically address annexation.[10] OCCP Goal 14.4 requires the city to consider the

---

[10] Those OCCP provisions are set out below:

> **"Goal 14.4 Annexation of Lands to the City**
>
> "Annex lands to the city through a process that considers the effects on public services and the benefits to the city as a whole and ensures that development within the annexed area is consistent with the Oregon City Comprehensive Plan, City ordinances, and the City Charter."
>
> "*Policy 14.4.2*
>
> "Include an assessment of the fiscal impacts of providing public services to unincorporated areas upon annexation, including the costs and benefits to the city as a whole as a requirement for concept plans.

impacts of providing public services to the annexed area and to ensure that development of annexed areas is consistent with the OCCP. OCCP Policy 14.4.2 requires that concept plans assess the fiscal impacts of providing public services to unincorporated areas upon annexation. OCCP Policy 14.4.3 authorizes the city to enlarge areas proposed for annexation in certain circumstances. One of those circumstances is the additional territory is needed to "implement a concept plan or sub-area master plan that has been approved by the Planning and City Commissions."

OCCP Goal 14.4 is the provision that seems most consistent with and most supportive of petitioner's view. That policy specifically applies to annexation decisions and requires that the city "[a]nnex lands to the City *through a process* that considers the effects on public services and the benefits to the city as a whole." (Emphasis added.) The city certainly could interpret that reference to be a reference to the "annexation process." Other OCCP language and polices, including OCCP Policies 14.4.2 and 14.4.3, which are discussed above, are consistent with such an interpretation.

The city assumes in its decision that the planning and zoning that will be required to urbanize the subject 122 acres will be determined in the yet-to-be completed Beavercreek Road Concept Plan planning process. Until the city knows how the annexed area will urbanize, *i.e.* until the Beavercreek Road Concept Plan is completed, it is not possible consider "the effects on public services and the benefits to the city as a whole" in any

---

"*Policy 14.4.3*

"Evaluate and in some instances require that parcels adjacent to proposed annexations be included to:

"• avoid creating unincorporated islands within the city;

"• enable public services to be efficiently and cost-effectively extended to the entire area; or

"• implement a concept plan or sub-area master plan that has been approved by the Planning and City Commissions."

meaningful way. That is why the city has effectively deferred that consideration to the Beavercreek Road Concept Plan process.[11] If the "process" that is referenced in OCCP Goal 14.4 must be limited to the annexation process, such a deferral is improper and OCCP Goal 14.4 likely would have the legal effect of forcing the city to wait until the Beavercreek Road Concept Plan is adopted before it proceeds with annexation with the Beavercreek Road Concept Plan area.

However, it is clear from the findings that the city adopted to address OCCP Goal 14.4 and related provisions that it does not interpret OCCP Goal 14.4 in that manner. Therefore, the question we must answer is whether the text of OCCP Goal 14.4, viewed in context, requires that the adequacy of public facilities to serve annexed territory once it is fully urbanized must be demonstrated in the "annexation process," making the city's reliance on a post-annexation *planning* process inconsistent with OCCP Goal 14.4. While the question is a reasonably close one, we do not believe the city's contrary interpretation is reversibly wrong under ORS 197.829(1) and *Church v. Grant County*, 187 Or App 518, 524, 69 P3d 759 (2003).[12] The nature, scope and extent of the "process" envisioned by OCCP

---

[11] The city's findings addressing OCCP 14.4 are set out below:

> "The city annexation process is set out in Chapter 14 of the [OCMC]. By requiring compliance with that code, the Metro Code, and the statewide Planning Rules, the city is identifying the effects of the full build-out of these annexed properties will have on public services and any benefit to the city as a whole. As part of the Beavercreek Road Concept Plan adoption, appropriate Master Plans, such as the Transportation System Plan, Water and Sewer Master Plans for example, will be updated to address the anticipated impacts." Record 63.

[12] ORS 197.829(1) provides:

> "The Land Use Board of Appeals shall affirm a local government's interpretation of its comprehensive plan and land use regulations, unless the board determines that the local government's interpretation:
>
> "(a) Is inconsistent with the express language of the comprehensive plan or land use regulation;
>
> "(b) Is inconsistent with the purpose for the comprehensive plan or land use regulation;

Goal 14.4 is not expressly limited to the annexation process. Therefore, the city's interpretation that the process can include a required post-annexation planning process is not inconsistent with the text of OCCP Goal 14.4.

The underlying purpose of OCCP Goal 14.4 and related city and Metro provisions appears to be to ensure that (1) a concept plan will precede actual urbanization of the annexed areas, (2) concept plans will provide the basis for planning and zoning of annexed areas for urban development, and (3) adequate and sufficient public facilities are extended to annexed areas as they urbanize in a way that does not financially burden or adversely affect public facilities and services in other parts of the city. As we have explained elsewhere in this opinion, the city took steps to ensure that urbanization cannot occur until the Beavercreek Road Concept Plan has been completed. The Beavercreek Road Concept Plan planning process must address public facility impacts of urbanization. While a number of contextual OCCP provisions seem to envision that planning and zoning for urbanization will precede annexation, those contextual provisions are not unworkable if annexation is the first step. Stated differently, as far as the apparent underlying purpose is concerned, it does not appear to matter whether planning and zoning comes before or after annexation, so long as such planning and zoning is completed before the annexed property is allowed to urbanize. While it is a reasonably close question, we conclude that OCCP Goal 14.4 and related OCCP and OCMC provisions not require that the Beavercreek Road Concept Plan must be in place before the city can annex any property within the Beavercreek Road Concept Plan planning area.

For the reasons explained above, subassignment of error B is denied.

"(c) Is inconsistent with the underlying policy that provides the basis for the comprehensive plan or land use regulation; or

"(d) Is contrary to a state statute, land use goal or rule that the comprehensive plan provision or land use regulation implements."

C. The City Failed to Analyze the Annexation Based on Potential Development of the Annexed Area

Subassignment of error C concerns OCMC 14.04.060(A). OCMC 14.04.060(A) sets out "factors" that the city must "consider" in reviewing an annexation proposal. Among the factors that the city must consider are whether the proposal conforms to the city's comprehensive plan and whether the city has adequate and available public services and facilities to serve the potential development.[13] In addressing OCMC 14.04.060(A) the city adopted a two-part view of potential development: (1) the potential development under the FU-10 zone (which the city found to be insignificant and adequately served by existing public facilities) and (2) the potential development when that existing holding zone is replaced by new city zoning for urban development (which will be identified in the not-yet-completed Beavercreek Road Concept Plan, a plan that will also address and resolve public facility impacts):

> "[T]he Facilities and Services discussion of the staff report indicate that there are adequate services to support the annexation at the zoning designation of FU-10. To the extent additional development will occur, the property will have to be re-zoned, which will not occur until the Concept Plan has been approved. The Concept Plan will have to demonstrate that public facilities and services for potential development will be accounted for once the Beavercreek Road Concept Plan is adopted. The concept plan will identify

---

[13] OCMC 14.04.060(A) provides, in part:

> "When reviewing a proposed annexation, the commission shall consider the following factors, as relevant:
>
> "* * * * *
>
> "2. Conformity of the proposal with the city's comprehensive plan;
>
> "3. Adequacy and availability of public facilities and services to service potential development;
>
> "* * * * *
>
> "7. Lack of any significant adverse effects on the economic, social and physical environment of the community by the overall impact of the annexation."

the impacts to the public facilities and services and the remedies necessary to accommodate the potential development on the annexed properties." Record 37.

We understand petitioner to raise two related but separate issues under this subassignment of error. Under OCMC 14.04.060(A)(2) and (3), the city was required to consider the "proposal" and "potential development." We understand petitioner to argue first that it was error for the city to ignore the development that is actually proposed in the disputed annexation application and instead defer comprehensive plan conformance questions and public facilities and services adequacy questions that may be posed by future urbanization of the annexed territory to the not-yet-completed Beavercreek Road Concept Plan."[14] Second, we understand petitioner to argue that even if the city's two-step approach is permissible, the record shows the city cannot even provide adequate public facilities for existing development on the 122 acres and the minimal additional development that is possible under FU-10 zoning.

1. Waiver

The city argues petitioner waived both of the issues presented under subassignment of error C. We agree with the city that the record citations provided by petitioner do not demonstrate that the second issue was raised below. Petitioner's stated concerns below with regard to the adequacy of public facilities were with the alleged inadequacy of those facilities to serve the more intense urban development that the annexation will make possible, not the sparse existing development or the additional sparse development that may be possible under FU-10 zoning. However, we do not agree with the city that petitioner failed to raise the first issue. The alleged impermissibility of relying on the not-yet-adopted Beavercreek Road Concept Plan was a constant theme in the testimony of petitioner and other annexation opponents.

[14] The application proposes approximately 2 million square feet of commercial development and approximately 1,500 units of residential development. Record 680.

2. The City's Reliance on the Beavercreek Road Concept Plan

At its core, the remaining issue is not that complicated. The parties simply interpret the legal requirement that is imposed by OCMC 14.04.060(A) differently. *See* n 13. Petitioner apparently reads OCMC 14.04.060(A) to require that the city *consider* the annexation "proposal" and any "potential development" under that proposal and *establish* that such potential urban development presently conforms to the city's comprehensive plan and that adequate public facilities and services are now available or already planned to serve that potential urban development before approving the annexation. If that is what OCMC 14.04.060(A) requires, the city's decision must be remanded. At the time the city adopted the challenged decision, the city did not know for sure what urban development will be proposed under the Beavercreek Road Concept Plan. Whether the "proposal" or the "potential development" that is referred to in OCMC 14.04.060(A) is the development proposed in the application or the development that will be allowed under the Beavercreek Road Concept Plan the city did not know how or whether adequate public facilities will be available for that urban development at the time the city approved the disputed annexation.

Although the city adopted no express interpretation of OCMC 14.04.060(A), it is quite clear that the city does not interpret OCMC 14.04.060(A) in the same way petitioner does.[15] The city apparently interprets OCMC 14.04.060(A) not to require, at the time of annexation, that the comprehensive plan authorize the ultimate urban development that is anticipated following annexation. The city also interprets OCMC 14.04.060(A) not to require that public facilities exist or that plans for public facilities to support the ultimate urban development that will be allowed under future plan and zoning amendments be in

---

[15] The closest the city comes to rejecting petitioner's interpretation and explaining its own express interpretation is as follows:

> "The City's Code contains provisions on annexation processing. Section 6 of Chapter 14 [which appears to be a reference to OCMC 14.04.060(A)] requires the City Commission 'to consider the following factors, as relevant'[.]" Record 64.

place at the time of annexation. Rather, the city interprets OCMC 14.04.060(A) to require that the city "consider" the ultimate comprehensive planning for the annexed area and to "consider" the adequacy and availability of public services and facilities to serve that urban development as "relevant factors." We understand the city to argue that since (1) annexation, in and of itself, authorizes no additional urban development of the annexed property, (2) no urban development of the 122 annexed acres is allowed or will be allowed under the existing FU-10 zoning, (3) no urban development will be possible before the Beavercreek Road Concept Plan is adopted and necessary comprehensive plan and zoning amendments are adopted to allow urbanization of the annexed area, and (4) the Beavercreek Road Concept Plan will be required to address the public facilities and services that will be needed for urbanization of the plan area, the city's findings that recognize and point out these facts are sufficient to "consider" the "relevant factors" set out in OCMC 14.04.060(A).

We conclude that the decision includes the above-described implied interpretation of OCMC 14.04.060(A). We also agree with the city that the city's interpretation and application of OCMC 14.04.060(A) is not reversible under ORS 197.829(1) and *Church v. Grant County*. *See Alliance for Responsible Land Use v. Deschutes Cty*, 149 Or App 259, 265-67, 942 P2d 836 (1997) (LUBA may not substitute its interpretation for express or implied interpretations of a local governing body).

D. Bad Faith

Under subassignment of error D, petitioner makes a "bad faith" argument. Petitioner appears to be concerned that the city's approval of the disputed annexation before the Beavercreek Road Concept Plan is complete may allow the applicant to qualify for a vested right to develop in ways that would be inconsistent with the Beavercreek Road Concept Plan when it is ultimately adopted. Petitioner never explains how this vesting of rights might come to pass and seems to recognize that because the annexation applicant has knowledge of the pending adoption of the Beavercreek Road Concept Plan it is highly unlikely that a

vested rights theory under *Clackamas County v. Holmes*, 265 Or 193, 508 P2d 190 (1973) would allow the applicant to assert a vested right to develop in ways that are inconsistent with the Beavercreek Road Concept Plan.

The city argues that petitioner waived this argument by failing to raise the issue below. The city also contends the bad faith argument is without merit. We agree with the city on both points.

E. OCMC 17.06.050

As we noted in discussing Example 10 under subassignment of error B above, OCMC 17.06.050 establishes a 60-day deadline for applying city zoning to annexed property. Under subassignment of error E, petitioner argues the city erred by annexing the subject property when it knew it would not be able to comply with OCMC 17.06.050 because the Beavercreek Road Concept Plan would not be completed in time to meet that deadline.

The city argues that the decision that is before LUBA is the annexation decision. The city contends that acts or failures to act that occur after that decision cannot provide a basis for reversing or remanding the annexation decision. We agree with the city.

Subassignment of error E is denied.

The first assignment of error is denied.

SECOND ASSIGNMENT OF ERROR

A. Legal Background

Petitioner's second assignment of error begins with a section that is entitled "Legal Background." Many of the cited OCCP and OCMC provisions that petitioner cites in the Legal Background" discussion under the second assignment of error were cited in the first assignment of error. The Legal Background section is followed by five subassignments of error, some of which have several sub-subassignments of error. As we explain below, petitioner and the city simply disagree about the nature of the legal obligation that those

OCCP and OCMC provisions impose on the city, at the time of annexation. We set out petitioner's Legal Background discussion before turning to her subassignments of error.

> "Like State law, Metro ordinances, and County ordinances which require ensuring public facilities and services can be provided, there are many parts of the City's Comprehensive Plan and Code which concern measures of the ability of the City to provide public facilities and services to the newly annexed land: a) the City is required to ensure the 'adequacy and availability of public facilities and services';[16] b) 'public facilities and services [are to be] provided in a timely, orderly and efficient manner';[17] c) [w]ith annexation of large blocks according to the plan, 'Annexation would be tied more directly to the City's ability to provide services efficiently';[18] d) 'The City should consider its ability to adequately provide public facilities and services';[19] e) '* * * ensure adequate public funding for the following urban facilities and services, if feasible';[20] f) the City is to 'ensure the cost of providing new public services * * * are born by the entity responsible for the new development to the maximum extent allowed under state law'; [21] g) the City is to 'ensure' the provision of services doesn't 'diminish the delivery of those same services to existing areas and residents';[22] h) '[Annex lands to the City through a process that considers] the effects on public services and the benefits to the city as a whole';[23] and i) the City is to consider a 'lack of

---

[16] The quoted language is from OCMC 14.04.060(A)(3) which, which is one of the "factors" the city must "consider" when reviewing an application for annexation. That text was set out earlier at n 13.

[17] The quoted language appears on page 79 of the OCCP, which addresses public facilities.

[18] The quoted language appears at page 118 of the OCCP, which addresses Urbanization. That language was quoted earlier at n 4.

[19] The quoted language appears at page 118 of the OCCP, which addresses Urbanization. That language was quoted earlier at n 4.

[20] The quoted language is from OCCP Plan Policy 11.1.1, which was quoted earlier in our discussion of Example 5.

[21] The quoted language is from Policy 14.3.4 which appears in the Urbanization Section of the OCCP. *See* n 26.

[22] The quoted language is from Policy 14.3.2 which appears in the Urbanization Section of the OCCP.

[23] The quoted language is from Goal 14.4, which appears in the Urbanization Section of the OCCP and addresses annexation. Goal 14.4 is set out at n 10.

any significant adverse effects on the economic, social and physical environment of the community'[24][.]" Petition for Review 25-26.

Petitioner then offers the following "summary" of the above listed OCCP and OCMC provisions:

> "In summary, at annexation the City is obligated to determine if it can provide public facilities and services to the potential new development through the developer's funding and its own funding without diminishing services to the existing City residents or causing economic, social and physical adversities, since the City will be responsible to provide services once the annexation is approved."

B. Subassignments of Error B, C and D

Just as petitioner argued the above described OCCP and OCMC provisions mandate that the Beavercreek Road Concept Plan and implementing comprehensive planning and zoning must precede annexation, petitioner argues at length under these assignments of error that the detailed public facility and service planning that will be required to urbanize the annexed 122 acres must precede annexation.

An erroneous assumption on petitioner's part, which permeates the petition for review, is that once the disputed 122 acres are annexed, the city will be immediately obligated to provide public facilities and services to the property to allow urbanization to go forward immediately. The city may be legally obligated to provide public facilities and services to those 122 acres at some point following annexation, but petitioner cites nothing that requires that the city immediately do so. Specifically, petitioner cites nothing that would legally require that the city extend public facilities and services before the Beavercreek Road Concept Plan planning process that will establish the nature of that urbanization and how the necessary public facilities will be provided and paid for is complete. Until those 122 acres

---

[24] The quoted language is from OCMC 14.04.060(A)(7) which is one of the "factors" the city must "consider" when reviewing an application for annexation. That text was set out earlier at n 13.

are planned and zoned in a way that allows them to be urbanized, the public facilities and public services needed by the subject 122 acres will remain essentially unchanged.

In rejecting petitioner's third legal theory under subassignment of error B of her first assignment of error, we addressed OCCP Goal 14.4, which requires that the city "[a]nnex lands to the city through a process that considers the effects on public services and the benefits to the city as a whole and ensures that development within the annexed area is consistent with the Oregon City Comprehensive Plan, City ordinances, and the City Charter." *See* n 10. In rejecting petitioner's subassignment of error C under her first assignment of error, we considered OCMC 14.04.060(A), which requires that the city consider a number of factors when considering an annexation proposal. *See* n 13. Among those factors are whether the annexation conforms to the comprehensive plan, and whether the public facilities that will be needed for the potential urban development that will be made possible by the annexation are adequate and available. We ultimately concluded in rejecting subassignments of error B and C under the first assignment of error that the city did not violate its obligations under those OCCP and OCMC requirements because it has ensured that the 122 acres will not urbanize until the required land use and public facilities planning is completed under the Beavercreek Road Concept Plan. The additional legal requirements that petitioner cites in her discussion of the "Legal Background" above and addresses in her arguments under subassignments of error B, C and D under her second assignment of error do not materially add to the legal obligations the city has under OCCP Goal 14.4 and OCMC 14.04.060(A)(2)(3). The conclusions that we reached there in addressing the city's interpretation and application of OCCP Goal 14.4 and OCMC 14.04.060(A)(2) and (3) require that we deny petitioner's subassignments of error B, C and D under the second assignment of error.

Subassignments of error B, C and D are denied.

C. Subassignment of Error E

Under subassignment of error E, petitioner argues the ballot title that the challenged resolution adopted and placed before the voters on November 6, 2007 is not supported by adequate findings or substantial evidence. According to petitioner, the city has not adequately explained how the annexed property can be adequately served with necessary public facilities and petitioner contends that the record does not demonstrate that the facilities and services needed for urbanization can be provided to the 122 acres.

Subassignment of error E relies on petitioner's view that public facility planning and land use planning and zoning must precede both urbanization and annexation under the OCCP and OCMC. We have rejected that view. Because we reject that view, subassignment of error E provides no basis for reversal or remand.[25]

Subassignment of error E is denied.

D. Subassignment of Error F

Under subassignment of error F, petitioner argues the disputed annexation violates OCCP 14.3.4.[26] We understand petitioner to argue the city should have ensured in its annexation decision that the public services that will be needed at the time the annexed property is urbanized are paid for by system development charges, to the maximum extent allowed by law.

As we have already explained, the city has not yet determined how the subject property will be urbanized, what public facilities and services will be required when the

---

[25] It also seems unlikely that LUBA has jurisdiction to review an election ballot title that was voted on in a November 2007 election, for a number of reasons.

[26] OCCP Policy 14.3.4 provides:

> "Ensure the cost of providing new public services and improvements to existing public services resulting from new development are borne by the entity responsible for the new development to the maximum extent allowed under state law for Systems Development Charges."

annexed area does urbanize, and how those needed public facilities and services will be paid for when the subject property does urbanize. Those determinations will be made in the Beavercreek Road Concept Plan planning process. When those determinations are made during the Beavercreek Road Concept Plan planning process, it may be that OCCP 14.3.4 will have some bearing on that planning process. But since the city's annexation decision does not decide how the annexed territory will be urbanized or how any needed public services will be provided and paid for, and the Beavercreek Road Concept Plan will make these decisions, it follows that the annexation decision does not violate OCCP 14.3.4.

Subassignment of error F is denied

The second assignment of error is denied.

THIRD ASSIGNMENT OF ERROR

Under her third assignment of error, petitioner argues the UGB amendment that included the subject property inside the UGB was justified based on a need for industrial land. We understand petitioner to contend that there is still a need for industrial land. Petitioner points out that Metro requires that land that is included in the UGB to meet industrial land needs must be planned and zoned for industrial use and protected for such industrial use. The OCCP similarly requires that the city provide an adequate supply of land for industrial use and protect such lands from inappropriate development. Petitioner contends that because the annexation applicant's proposal and the draft Beavercreek Road Concept Plan both call for commercial and residential development within the subject 122 acres, the annexation violates Metro and OCCP requirements that industrial land be protected for industrial use. One of those OCCP requirements is OCCP Goal 2.6, which provides:

> "Industrial Land Development: Ensure an adequate supply of land for major industrial employers with family-wage jobs."

The challenged decision includes the following findings addressing OCCP Goal 2.6:

> "The Beavercreek Road Concept Plan is being completed and will create a community that provides for industrial, employment, office and residential

> uses arranged in a manner that maximizes the available services and provides for a mix of supporting uses. The proposed lands for annexation will receive the zoning as identified within the concept plan once approved. The preliminary concept plan identifies a small area of industrial lands within the proposed annexation area that will add to the industrial lands within the city." Record 57.

Once again, petitioner's assignment of error is based on erroneous assumptions about what the disputed annexation does and what the disputed annexation must do under the cited Metro and OCCP provisions that require an adequate supply of industrial land. Petitioner's arguments under the third assignment of error all appear to be directed at the Beavercreek Road Concept Plan, which will determine how much of the annexed area will be developed industrially. The city's annexation decision does not determine how many of the annexed 122 acres will be developed industrially. Petitioner's arguments under the third assignment of error therefore provide no basis for reversal or remand.

The third assignment of error is denied.

FOURTH ASSIGNMENT OF ERROR

A. Late Notice under Metro Code 3.09.030(E) and ORS 197.615(2)

Metro Code 3.09.030(E) requires that within 30 days after a final decision on a boundary change application, the reviewing entity must give written notice to "Metro and all necessary parties." Under ORS 197.615(2) a local government is required to give notice of a post acknowledgment plan amendment to persons who have requested such notice. Petitioner argues the city did not give notice until 44 days after its annexation decision was rendered. Petitioner also asserts an undeveloped argument that the city's action deprived unspecified members of the public their right to equal protection of the law.

The city argues petitioners failed to raise any notice issue concerning Metro Code 3.09.030(E) or ORS 197.615(3). The city also argues that petitioner makes no attempt to

show how any procedural error the city may have committed under Metro Code 3.09.030(E) or ORS 197.615(3) prejudiced petitioner's substantial rights.[27]

Petitioner does not respond to the city's waiver defense, and makes no attempt to show how the alleged delay in giving notice of the annexation decision prejudiced *petitioner's* substantial rights.

Subassignment of error A is denied.[28]

B. Resident Voters Who do not Own Property

We understand petitioner to assign error to the city's failure to protect the right of voters who do not own property to participate in the annexation petition.

The city contends petitioner did not raise this issue below. Petitioner does not respond to the city's waiver defense. We therefore do not consider this subassignment of error further.

Subassignment of error B is denied.

C. Posted Notice Was Inadequate

OCMC 17.50.100(B) requires that notice of certain city land use hearings must be posted on the property in advance of the hearing. Such posted notice is to be "posted within ten feet of the street and shall be visible to pedestrians and motorists." Petitioner argues that the notice posted by the applicant was inadequate for a number of reasons.

Petitioner speculates that the substantial rights of other persons who are not parties to this appeal may have been prejudiced by the allegedly defective notice. However, petitioner does not argue that her substantial rights were prejudiced. Without a demonstration that the

---

[27] Under ORS 197.835(9)(a)(B), LUBA may reverse or remand a land use decision if a local government "[f]ailed to follow the procedures applicable to the matter before it in a manner that prejudiced the substantial rights of the petitioner."

[28] Although we need not and do not reach the question, it also seems doubtful that the city's annexation decision is accurately described as a post-acknowledgment plan amendment. If not, ORS 197.615(2) would not apply.

alleged notice defect under OCMC 17.50.100(B) prejudiced petitioner's substantial rights that alleged notice defect does not provide a basis for reversal or remand.

Subassignment of error C is denied.

D. City Violated its Own Timeline

We quote petitioner's final subassignment of error below:

"The City failed to use its own time line for the November 2007 election App. F."

Subassignment of error D appears on page 50 of the petition for review. It is not accompanied by any argument. The cited appendix F is a table. If we consider that table to be petitioner's argument in support of subassignment of error, petitioner's petition for review exceeds the 50-page limit specified by OAR 661-010-0030(2)(b).

One column on the appendix F table is labeled "City Timeline Date Requirement." The adjoining column is labeled "Actual Date." The table indicates that four events occurred after the listed "City Timeline Date Requirement." The "Actual Date" column list a question mark for two events. The table indicates the Election was held on the date specified in the "City Timeline Date Requirement."

Because considering appendix F to be part of the petition for review would make the petition for review exceed the 50-page limit specified in our rules and because appendix F makes no attempt to explain the source of the alleged timeline requirement or whether that source specifies a legal consequence for failing to meet the timeline, appendix F is not a sufficiently developed argument to provide a basis for reversal or remand. For both reasons we reject subassignment of error D.

The fourth assignment of error is denied.

INTERVENOR-PETITIONER KOSINSKI'S ASSIGNMENTS OF ERROR

Intervenor-petitioner's first assignment of error is denied for the same reasons we rejected petitioner's subassignment of error F under petitioner's second assignment of error.

Intervenor-petitioner's second assignment of error appears to allege that the procedures the city has followed in adopting the Beavercreek Road Concept Plan and a neighboring concept plan violate OCCP Goals and Policies that encourage citizen participation. Because these arguments are directed at the concept plans rather than the annexation decision that is before us in this appeal, they provide no basis for reversal or remand. Intervenor-petitioner's second assignment of error is denied.

Intervenor-petitioner's third assignment of error overlaps petitioner's first assignment of error and is denied for the same reasons we denied petitioner's first assignment of error.

The city's decision is affirmed.

BEFORE THE LAND USE BOARD OF APPEALS

OF THE STATE OF OREGON

ELIZABETH GRASER-LINDSEY,
Petitioner,

vs.

CITY OF OREGON CITY,
Respondent,

and

OREGON CITY GOLF CLUB,
Intervenor-Respondent.

LUBA No. 2008-170

FINAL OPINION
AND ORDER

Appeal from City of Oregon City.

Elizabeth Graser-Lindsey, Beavercreek, filed the petition for review and argued on her own behalf.

Carrie A. Richter, Portland, filed the response brief. Carrie A. Richter and Jennifer M. Bragar argued on behalf of respondent. With her on the brief were Edward J. Sullivan and Garvey Schubert Barer, PC.

Kelly S. Hossaini, Portland, represented intervenor-respondent.

HOLSTUN, Board Member; RYAN, Board Member, participated in the decision.

BASSHAM, Board Chair, did not participate in the decision.

REMANDED 08/20/2009

You are entitled to judicial review of this Order. Judicial review is governed by the provisions of ORS 197.850.

But the ECONorthwest market analysis is not a sufficient basis for the city to proceed with its Title 11 planning to divert some of the 308 Industrially designated acres to allow non-industrial development of those acres. If the city were permitted to do so, and Metro simply conformed its mapping to the city's concept plan under MC 3.07.450(B), the regional shortage of Industrially designated land would simply be exacerbated.

For the reasons explained above, we conclude above that the city's decision to designate only approximately 74 acres out of the total 308 acres that carry the Industrial design type for industrial use in accordance with MC 3.07.430 is not consistent with that design type and is not consistent with the city's obligation under MC 3.07.1140 to conduct its Title 11 planning consistently with Metro's design types. Remand is therefore required.

We have addressed some, but not all of petitioner's arguments under her first assignment of error. The petition for review also includes two more assignments of error that we have not addressed. The issues presented by those arguments may or may not arise if the city on remand adopts a new concept plan that complies with MC 3.07.1120 and 3.07.430.

ORS 197.835(11)(a) provides:

> "Whenever the findings, order and record are sufficient to allow review, and to the extent possible consistent with the time requirements of ORS 197.830 (14), the board shall decide all issues presented to it when reversing or remanding a land use decision described in subsections (2) to (9) of this section or limited land use decision described in ORS 197.828 and 197.195."

The statutory deadline established by ORS 197.830(14) for LUBA's final opinion in this appeal expired some time ago. We therefore remand the decision without considering petitioner's remaining arguments.

The city's decision is remanded.

BEFORE THE LAND USE BOARD OF APPEALS
OF THE STATE OF OREGON

ELIZABETH GRASER-LINDSEY Petitioner, v. CITY OF OREGON CITY Respondent and OREGON CITY GOLF CLUB Intervenor-Respondent.)	)	LUBA No. 2008-170

PETITION FOR REVIEW

Elizabeth A. Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

Petitioner

Edward J. Sullivan, OSB #69167
Carrie A. Richter, OSB #00370
Garvy, Schubert and Barer, PC
121 SW Morrison, Suite 1100
Portland, OR 97204
(503) 553-3118

Attorneys for Respondent

Kelly S. Hossaini
Miller Nash LLP
111 SW Fifth Avenue, Suite 3400
Portland, OR 97204
(503) 205-2332

Attorney for Intervenor-Respondent

TABLE OF CONTENTS

Page

I. PETITIONER'S STANDING 1

II. STATEMENT OF THE CASE 1

A. Nature of the Land Use Decision and Relief Sought 1

B. Summary of Arguments 1

C. Summary of Facts 2

III. LUBA'S JURISDICTION 2

IV. ARGUMENT 2

FIRST ASSIGNMENT OF ERROR 2

Oregon City Erred In Adopting Oregon City Ordinance 07-1008 And, By This Adoption, (1) Violated Applicable Law Requiring Protection Of Industrial Land For Industrial Use Such As Metro Title 4 Especially Metro Code 3.07.430 And 3.07.450, Title 11 Especially 3.07.1120 F And Metro Code 3.01.040, And Oregon City Comprehensive Plan (OCCP) Goals 2.6 And 2.7 And Related Policies; (2) Misconstrued These Laws Pertaining To Protection Of Industrial Land For Industrial Use; (3) Did Not Support Its Decision With Correct Analysis Of Industrial Land Use And Did Not Support Its Decision With Adequate Findings Or Reasons Or With Substantial Evidence In The Whole Record In Violation of OAR 661-010-0071 And 661-010-0073; (4) Acted Outside Its Jurisdiction Concerning A Boundary Change Resulting In An Acknowledged Industrial Designation And Determination Of The Buildable Land Supply Made By Metro In Violation of Relevant Laws Such As OAR 661-01-0071 and 73, ORS 195, 197 and 268; (5) Violated The Laws And Precedent Governing The Process Of Bringing Lands Into The Urban Growth Boundary For Industrial Use and Governing The Lands Brought Into The Urban Growth Boundary For Industrial Use Such As Statewide Planning Goal 2, 3, 4 And 14, OAR 660-009, Metro Ordinance 02-969B And Metro Ordinance 04-1040B, Metro Code 3.01.040, 3.07.810, OCCO Goals 2.6 And 14.1 And Related Policies And *Opus Development Corp. v. City of Eugene*, *Concerned Citizens v. Jackson County*, And *1000 Friends of Oregon v. City of North Plains*; And (6) Violated Relevant Law Requiring Maintaining Consistency And Coordination Of Government Planning Such As ORS 268.354(2)(d), Statewide Planning Goal 2 And 14, Metro Code 3.01, 3.07 Titles 8 and 11 And OCCP.

SECOND ASSIGNMENT OF ERROR 30

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

Oregon City Erred In Adopting Oregon City Ordinance 07-1008 Which Violated Relevant Laws Such As Statewide Planning Goals 11 and 12, OAR 660 Divisions 9, 11 and 12, Metro Code 3.07.1120, OCCP Goals 2, 5, 11 and 14 and Related Policies When It (1) Failed To Provide Or Reference A Conceptual Transportation Plan, Conceptual Public Facilities And Services Plan Including Parks, Police, Fire And Solid Waste, A Conceptual School Plan, And A Natural Resource Protection Plan That Would Serve The Site And Integrate It With Other Plans; (2) Failed To Estimate When Each Planned Public Facility Project Will Be Needed, What The Trigger Would Be Such As Population Level, Service Level Standards, Date And Provide Detailed Strategies For Preparing The Total Land Supply; (3) Failed To Provide Rough Cost Estimates For Some Public Facilities And Services Such As Parks, Police And Fire And Part Of Transportation; (4) Failed To Adequately Evaluate The Ability Of Potential Funding Mechanisms To Fund The Development, To Discuss Local Fiscal Policies, And To Evaluate Likely Financing Approaches; To Coordinate With Its Capital Improvement Program Or Discuss How The Concept Plan Would Be Integrated Into It; And To Ensure Measures Will Be In Place To Ensure Cost Is Borne By The Developer; (5) Failed To Consider, Evaluate, Plan Implementation Approaches Or Otherwise Ensure Extension Of New Services Does Not Diminish Delivery Of Those Same Services To Existing Areas And Residents In The City As A Whole Where Substantial Evidence In The Record Indicates That Delivery Of Services To The Existing City As A Whole Will Be Diminished; (6) Failed To Show Compliance With Findings Of Resolution 07-24 Which Deferred Annexation Compliance To The Concept Plan As Decided By *Graser-Lindsey V. Oregon City*; (7) Failed To Comply With Statewide Planning Goals 5 And 7; (8) Failed To Provide The Basis For Specific Implementation Measures; (9) Failed To Be Able To Plan Public Services Properly While The Uses Are Unknown, Due To Being Contested, As Decided In *1000 Friends Of Oregon V. North Plain*; And (Throughout) Failed To Provide Adequate Findings.

THIRD ASSIGNMENT OF ERROR 45

Oregon City Erred In Adopting Oregon City Ordinance 07-1008 When (1) The Concept Plan Is Out Of Compliance With OCCP P. 16 #3 And The Findings Are Insufficient And Not Supported By Substantial Evidence In The Record; (2) The Process Violated The Substantial Rights Of The Petitioner, And (3) The Citizen Involvement Process For Adopting The Concept Plan Did Not Comply With The Acknowledged Citizen Involvement Program Or Statewide Planning Goal 1, The Findings Were Insufficient To Support The Decision And Not Supported By An Adequate Factual Basis, And Substantial Evidence In The Whole Record Shows The Citizen Involvement As Out Of Compliance.

V. CONCLUSION 50

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

APPENDICES

Page

A. City of Oregon City Ordinance No. 07-1008 and Findings..... App-1

B. Metro Title-4 Employment and Industrial Areas Map..... App-24
The Metro's adopted 2040 Growth Concept map can be seen most clearly at http://www.oregonmetro.gov/files/planning/2040_growth_concept.pdf.

C. Comparison of Maps in the Record Showing the 2002 and 2004 Metro Title-4 Industrial UGB Expansions and Other Lands in the Beavercreek Road Concept Plan Area..... App-25

D. Photos of Regional Power Transmission Line Corridors and Concept Plan Signs..... App-27

E. Rec. 1871 in color..... App-28

F. Timber Zoning..... App-29

G. Comparison of Existing and Mitigated Build Traffic Conditions From Rec. 1876 and 431..... App-30

Local Laws

Oregon City Comprehensive Plan p. 1, 13, 16, 118
Goals 1, 2, 5, 11, 14

Oregon City Municipal Code 17.04.290, 17.50.90, 17.50.170

Urban Growth Management Agreement: Clackamas County-City of Oregon City

Findings to Oregon City Resolution 07-24

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

I. PETITIONER'S STANDING

Petitioner has standing under ORS 197.830(2) to petition this Board for review of this land use decision made by the Respondent, Oregon City, because Petitioner (1) filed a notice of intent to appeal with LUBA, and (2) appeared before Oregon City through oral and written testimony in the proceedings leading to the land use decision appealed in this action. Rec. 661-803, 853-893, 1094-1185, 1495-1593 et al.

II. STATEMENT OF THE CASE

A. Nature of the Land Use Decision and Relief Sought

The decision appealed is Oregon City's Ordinance No. 07-1008 adopted September 17, 2008. Rec. 5-6. This decision adopted the Beavercreek Road Concept Plan and amended the Oregon City Comprehensive Plan (OCCP) and its ancillary documents.

Pursuant to ORS 197.835, the Petitioner seeks reversal of Oregon City's decision adopting 07-1008.

B. Summary of Arguments

Oregon City violated state law, Metro Code and its own Comprehensive Plan when 1) it planned Title-4 Industrial land for commercial and residential rather than protected industrial use by limiting non-industrial uses; it did not comply with Metro Ordinances 02-969 B and 04-1040 B which expanded the UGB; it acted outside its jurisdiction concerning a UGB change and determination of the buildable land supply where Metro has jurisdiction; and it did not maintain consistency and coordination of planning; (2) it failed to provide appropriate plans, to project timing, to estimate costs, to evaluate likely funding, to plan implementation so the rest of the city would not have diminished service, to comply with the findings of its Resolution 07-24, to plan when the uses were unsettled ; and (3) it failed to use evidence to determine popular sentiment; it violated the substantial rights of petitioner;

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

and it violated the acknowledged citizen involvement program.

C. Summary of Facts

In 2002 and 2004 respectively, Metro expanded the Urban Growth Boundary (UGB) to include 245- and 63-acres of industrial land. Rec. 7, 1524. These lands are mapped on Metro's Employment and Industrial Land Map. Appendix B. The 453-acre Beavercreek Road Concept Plan plans the 308 Title-4 Industrial acres as well as a smaller amount of 2040 Growth Concept Title-4 Employment and Outer Neighborhood land which was already in the UGB and/or City. Rec. 42. The concept plan describes 127 net acres as Title-4 compliant with the balance a mix of commercial/retail and residential uses. Rec. 50. The site, bordered by Beavercreek Rd. to the west, is connected to I-205 and the regional road network by Highway 213. Rec. 411.

III. LUBA'S JURISDICTION

The appealed decision is a final land use decision of local government concerning application of statewide planning goals, comprehension plan provisions, and land use regulations. As provided by ORS 197.825, LUBA has exclusive jurisdiction to review local government land use decisions, within the meaning of ORS 197.015(10)(a)(A).

IV. ARGUMENT

FIRST ASSIGNMENT OF ERROR

Oregon City Erred In Adopting Oregon City Ordinance 07-1008 And, By This Adoption, (1) Violated Applicable Law Requiring Protection Of Industrial Land For Industrial Use Such As Metro Title 4 Especially Metro Code 3.07.430 And 3.07.450, Title 11 Especially 3.07.1120 F And Metro Code 3.01.040, And Oregon City Comprehensive Plan (OCCP) Goals 2.6 And 2.7 And Related Policies; (2) Misconstrued These Laws Pertaining To Protection Of Industrial Land For Industrial Use; (3) Did Not Support Its Decision With Correct Analysis Of Industrial Land Use And Did Not Support Its Decision With Adequate Findings Or Reasons Or With Substantial Evidence In The Whole Record In Violation of OAR 661-010-0071 And 661-010-0073; (4) Acted Outside Its Jurisdiction Concerning A Boundary Change Resulting In An Acknowledged Industrial

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

Designation And Determination Of The Buildable Land Supply Made By Metro In Violation of Relevant Laws Such As OAR 661-01-0071 and 73, ORS 195, 197 and 268; (5) Violated The Laws And Precedent Governing The Process Of Bringing Lands Into The Urban Growth Boundary For Industrial Use and Governing The Lands Brought Into The Urban Growth Boundary For Industrial Use Such As Statewide Planning Goal 2, 3, 4 And 14, OAR 660-009, Metro Ordinance 02-969B And Metro Ordinance 04-1040B, Metro Code 3.01.040, 3.07.810, OCCO Goals 2.6 And 14.1 And Related Policies And *Opus Development Corp. v. City of Eugene, Concerned Citizens v. Jackson County*, And *1000 Friends of Oregon v. City of North Plains*; And (6) Violated Relevant Law Requiring Maintaining Consistency And Coordination Of Government Planning Such As ORS 268.354(2)(d), Statewide Planning Goal 2 And 14, Metro Code 3.01, 3.07 Titles 8 and 11 And OCCP.

Subassignment of Error A

Although relevant law such as Statewide Planning Goal 2, Metro Code 3.01 and 3.07 Titles 8 and 11 and Oregon City Comprehensive Plan requires that local governments in their planning maintain consistency with regional plans[1], Oregon City erred in adopting Ordinance 07-1008 adopting the Beavercreek Road Concept Plan and incorporating it into its Comprehensive Plan without the concept plan and comprehensive plan amendments complying with Metro Code 3.01 and 3.07. Metro Code 3.07.450, the Employment and Industrial Areas Map, shows that the majority of the concept planning area is industrial and must be planned as industrial and 3.07.430 tells how non-industrial development will be limited in industrial areas, but the concept plan does not comply with this law planning more of the industrial land residential and commercial/retail[2] than the law allows. State[3], Metro and Oregon City's own law require that the City maintain consistency with Metro planning. Statewide Planning Goal 2 states:

---

[1] The City recognizes, "Compliance with the Statewide Planning Goals is a specific requirement for changes to the Comprehensive Plan..." Rec. 14.

[2] The City itself recognized in delaying the effective date of the plan due to the absence of implementing measures that the plan fell short of the standard "to assure... consistency and adequacy" and hence the editorial remark was "couch" which erroneously was typed into the text. Rec. 8 line 2.

[3] ORS 268.354 (2) (d) states "(2) For a boundary change that is subject to the jurisdiction of the district pursuant to ORS 268.347 the district shall:... (d) Ensure that a boundary change is in compliance with the Metro regional framework plan..." OAR 660-009-0030.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

"City… plans and actions related to land use shall be **consistent** with the comprehensive plans of cities and counties and regional plans adopted under ORS Chapter 268… Each plan and related implementation measure shall be **coordinated** with plans of affected governmental units." (bold added)

Metro Code 3.01 including 3.01.040 requires the Growth Concept design types to be established by Metro and followed by local governments:

"(a) Land added to the UGB by legislative amendment… or by major amendment… shall be subject to the requirements of Title 11, Planning for New Urban Areas, of the Urban Growth Management Functional Plan…" and
"(b) …when the Council adopts a legislative or major amendment to the UGB, the Council shall:…
(1) …designate the city… responsible for adoption of amendments to comprehensive plans… pursuant to Title 11…
(2) Establish the 2040 Growth Concept design type designations applicable to the land added to the UGB, including the specific land needed, if any, that is the basis for the amendment."

Metro Code 3.07 Title 8 especially 3.07.810 especially D states:

"Cities… that amend their comprehensive plans or land use regulations… shall make the amendments in compliance with the functional plan."

Metro Code 3.07.1105 states, "It is the intent of Title 11 that development of areas brought into the UGB implement the Regional Framework Plan and 2040 Growth Concept. Metro Code 3.07.1120 elaborates,

"The comprehensive plan provisions shall be **fully coordinated** with all other applicable plans. The comprehensive plan provisions **shall** contain an urban growth plan diagram and policies that **demonstrate compliance with** the RUGGO, including the Metro Council adopted 2040 **Growth Concept design types**. (bold added)

Oregon City's Comprehensive Plan p. 1 states:

"Oregon City's Comprehensive Plan and implementation ordinances must comply with applicable Statewide Planning Goals adopted by the Land Conservation and Development Commission as the result of a 1973 state law. The plan must also comply with the relevant portions of Metro's 1998 Urban Growth Management Functional Plan."

Consequently, the City must be in compliance with Metro's Functional Plan, Code

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

3.07 Title 4, the 2040 Growth Concept design types and other law.

Metro's Urban Growth Management Functional Plan gives provisions for industrial land at Metro Ordinance 3.07 Title 4. Title 4's stated purpose and intent is:

> "to provide and protect a supply of sites for employment by limiting the types and scale of non-industrial uses in... Industrial... areas". Metro Code 3.07.410.

Metro Code 3.07.430 describes the "Protection of Industrial Areas":

> "A. Cities and counties shall review their land use regulations and revise them... 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 they serve primarily the needs of workers in the area. One such measure shall be that new buildings for stores, branches... 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...
> "B. Cities and Counties shall review their land use regulations... to limit new buildings for the uses described in subsection A to ensure that they do not interfere with the efficient movement of freight...
> "D. Cities and counties may allow division of lots or parcels into smaller lots or parcels as follows:...
> "2. Lots or parcels larger than 50 acres may be divided into smaller lots... so long as the resulting division yields at least one lot or parcel of at least 50 acres in size." Metro Ordinance 3.07.430.

Metro Ordinance 3.07.450 Employment and Industrial Areas Map specifies:

> "A. The Employment and Industrial Areas Map is the official depiction of the boundaries of Regionally Significant Industrial Areas, Industrial Areas and Employment Areas." Metro Code 3.07.450 A. Appendix B. Rec. 1525 & 1097.

Of the 453-acre concept plan[4], most of the plan area is Title-4 Industrial -- 308 acres from the 2002 and 2004 UGB expansions[5] (Appendices B and C) -- as shown on the Metro

[4] "Total Project Area Gross Acres 453" Rec. 91, 7. "There are 448 gross acres in the project area, not including the right-of-way for Loder Road (approximately five acres)." Rec. 44.

[5] Oregon City says, "Metro brought 248 gross acres in the UGB in 2002 and an additional 63 acres were added in 2004. The remaining acreage was in the UGB and/or Oregon city limits prior to 2002. These areas (308 gross acres) are designated as the Industrial Design Type on Metro's 2040 Growth Concept Map." Rec. 18. The concept plan and findings correctly give the 2002 and 2004 UGB expansion areas at Rec. 42, 18, 7, but at Rec. 47 and 23 they omitted the 2004 acreage of 63 acres: "Metro brought the majority of the concept plan area (245 gross acres) into the UGB in 2002 and 2004 to fulfill regional industrial employment needs." Rec. 47, 23. The meaning is garbled and erroneous at Rec. 23 (despite being correct in an earlier draft at Rec. 645).

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

Code 3.07.450 Employment and Industrial Areas Map. Appendices B and C, Rec. 1524 & 725. About 64 additional acres[6,7] are Title-4 Employment Land with similar rules to Title-4 Industrial Land limiting commercial. Metro Code 3.07.440. Appendices B and C. Rec. 44, 42. Altogether that yields about 372 acres of Metro Title-4 Industrial and Employment Lands in the 453-acre concept plan[8]. The concept plan, however, only plans 175 gross acres (Rec. 91 middle box under hybrid) in the north part of the concept plan area, called the North Employment Campus, as Title-4 compliant and industrial and states "The [North Employment Campus] subdistrict is intended to comply with Metro's Title 4 regulation." Rec. 49, 50, 24[9], 47 right bottom. This petition does not find error with how the City planned the Title-4 Employment lands which are lumped with the Industrial lands in the concept plan; the violation of Title 4 occurs wholly in the Title-4 Industrial lands to the south of the North Employment Campus. Compare Rec. 49 with Appendix B. Oregon City violates Metro Code 3.07.450 and 3.07.430 in not planning the entire area indicated on Metro's Employment and Industrial Areas map as Title-4 compliant, and, consequently, the Finding of "coordination" (Rec. 14) is not factually based, so, for this reason, the decision must be reversed.

"These areas (308 gross acres including those already within the UGB) are designated as the Industrial Design Type on Metro's 2040 Growth Concept Map"; none of the 308 acres were in the UGB prior to 2002.

[6] The acreages have been difficult to figure out because the city and its consultant who did the mapping and acreage calculations did not make the data easily or completely available despite numerous requests. Rec. 1101-1109, 1500, 1505. See Appendix C for more details on the acreages.

[7] "A portion of the study area (approximately 50 acres) is currently within the existing city limits and zoned Campus Industrial." Rec. 44. About 14 acres in the county are the balance of the Title-4 Employment lands. Appendices B and C.

[8] The balance of the concept plan area – land to the south of the site, jagged lots along diagonal Beavercreek Road to the west of the site, and a tiny lot in the north -- was apparently brought into the UGB in 1979 and remains in the county. It is Metro design-type Outer Neighborhood. Appendices B and C. Rec. 1524 & 725, 42, 801.

[9] The Findings state: "The North Employment Campus is to provide for the needed family wage employment that strengthens and diversifies the economy and will be compliant with Metro's Title 4 regulations." Rec. 24.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

The uses indicated in Metro Code 3.07.430 A, such as commercial and retail, are to be limited to "serve primarily the needs of workers in the [industrial] area"[10] and to comprise less that 5,000 or 20,000 sq. feet in the development. Metro Code 3.07.430 A and C. The City only intends to limit incompatible uses in the North Employment Campus. Rec. 24. Non-industrial uses, of the type specifically mentioned in Metro Code 3.07.430 A to be limited such as "retail commercial uses… and retail and professional uses… offices" and residential[11], are not limited by the concept plan but, instead, non-industrial uses extensively and illegally displace industrial uses, making up just over half the gross acres and almost half the unconstrained acres, that is,

- Title-4 uses are planned to comprise only 175 of 372 gross Title-4 acres (47%)
- Title-4 uses are planned to comprise only 123 of 225.7 buildable/unconstrained Title-4 acres[12] (54%)

---

[10] The "area" being referred to ("primarily the needs of the workers in the area") is the area where the workers are, the industrial area. The "area" is discussed in a Title (Metro Code 3.07) and section (Metro Code 3.07.430) both with titles focused on "Industrial Areas" and it speaks of "workers" in the area, not "residents" or other people making clear that it is the "industrial area" being referred to.

[11] Metro made no provision for residential displacing industrial as it did for small incursions of retail commercial. Metro Ordinance 3.07.430.

[12] The North Employment Campus (NEC) yields 123 unconstrained acres (Rec. 91 FN *); the other numbers are explained at FN 27. The Beavercreek Road Concept Plan and Findings do not state how much of the 372-acres of Title-4 land is buildable (FN 6), so this number must be determined from the data given. Contrained Title-4 land shown at Rec. 46 (compare Appendix B and Rec. 49) consists of 146.3 acres: 5 acres for Loder Rd. (Rec. 44), 13.9 acres of "low impact development" (Rec. 46 legend; "a minimum of 50% of the conservation area must be open space. No residential uses are permitted", Rec. 56 item a, 16 bottom, 49 light green in south), and 127.4 acres of constrained land from Rec. 46 (3.6 + 3.4 + 94.3 + 1.3 + 16.3 + 8.5). The 372 gross, Title-4 acres less the 146.3 constrained acres yields 225.7 acres of buildable Title-4 acres (including local roads other than Loder Rd. The 123 unconstrained NEC acres divided by the 225.7 unconstrained Title-4 acres is 54%.

Net buildable acres would remove 15% from both numbers: 105 net unconstrained Title-4-compliant acres/192 net unconstrained Title-4 acres = 54%. Rec. 90 footnote *. OAR 660-007-0005 defines "net buildable acre" without rights-of -way.).

These calculations concur reasonably well with other acreage data given. "When land for power lines, the natural gas line, natural resources and committed structures are removed, the net buildable acreage is approximately 292 acres." Rec. 8, 45. The 292 net buildable acres less 225.7 of buildable Title-4 acres yields 66.3 buildable Outer Neighborhood acres. Rec. 46 and Appendix C. The 76-acres of OuterNeighborhood (Appendix C) less the 3.8 acres of constraints shown at Rec. 46 (1.8 + 1.5 + an estimated 0.5 under the diagonal gas line, Ref. 46, Appendix C) yields 72.2 buildable acres. Despite some estimated acreages (FN 6),

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

Viewing Appendix C and Rec. 49, the jagged pink Title-4 Industrial land becomes over half the Mixed Employment Village (MEV)[13] and part of Main Street (MS)[14] and West Mixed Use Neighborhood (WMUN) and the orange Title-4 Industrial land and considerable pink Title-4 Industrial land to the north and west become East Mixed Use Neighborhood (EMUN). Rec. 53, 77. The City extensively displaces Title-4 Industrial with limited uses.

Oregon City makes no effort to ensure the limited uses "serve primarily the needs of workers" such as by limiting their size and demonstrating that the size complies with the requirement, either by locating them within an industrial subdistrict, by planning various implementation measures such as ensuring concurrency of limited uses with industrial construction, or by using other necessary measures. There is no analysis of the amount of limited uses and the needs of the workers and no comparison of the two. The location of the retail/commercial is well away from the industrial area requiring a special trip, so the worker may be more likely to go to an existing shopping center just northwest of the industrial site on the 4- to 5-lane Beavercreek Road than travel south to the new shopping center on the 2- to 3-lane Beavercreek Road (Rec. 24 & 57, 60 top right, 36 – Clairmont to NW). Substantial evidence in the record indicates the new shopping center, MS and MEV, which would have residential on much of 3 sides and borders industrial over a tiny segment, is intended for "residents" and surrounding neighborhoods to use, not "workers". Rec. 49, 731[15], 736, 51-52.

---

the two approaches agree within 5.9 acres.

[13] Mixed Employment Village: "retail, office, civic, and residential" Rec. 51, 76.

[14] Main Street: "commercial, mixed use and services" Rec. 52, 76.

[15] The retail commercial was to be for Title-4 "workers" rather than residents of this and surrounding neighborhoods, retail/commercial workers, or users of this roadway, but evidence in the record indicates they will not be: (1) The State reviewer disbelieved that the site planning (where Alternates A and D were similar to the Hybrid (Rec. 88, 49)) would prevent half of potential car trips. Rec. 731 #12 . The City's consultant acknowledges that there was no modeling, but the trip reductions was speculation. Rec. 736 box 4 (response to Rec. 731 #12). (2) The consultant also states the retail/commercial will be used for residents: "a significant proportion of existing and future residents of the Oregon City area will work, shop, and recreate at this site"

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

The substantial evidence in the record, together with the lack of implementation measures such as concurrency requirements and two large annexation applications for residential and commercial[16], indicate that the non-industrial uses would not serve primarily the needs of workers but would proceed the industrial uses by years or decades, which would ensure these uses will not to serve workers at all. Rec. 48[17], 854 middle, 1094 bottom, 655 bottom. The failure of the retail/commercial to primarily serve the workers puts the concept plan in violation of Metro Code 3.07.430 A.

The limited uses far exceed the 5,000 or 20,000 sq. ft. limits Metro Code 3.07.430 specifies: (a) the limited uses may occur in the North Employment Campus, (b) although an estimated half of the 26-acre Mixed Use Village and the 10-acre Main Street subdistricts is Title-4 Industrial (Appendices B and C, Rec. 49, 91), the limited uses are planned to comprise the entire 36 acres and the limited uses would comprise up to half of the 27.8-acre "Conservation and Low-Impact Development" district despite its being all Title-4 Industrial (Rec. 46, 56 "a"), totaling all together about 31.9 acres[18] or 1,389,564 sq. ft. [19] of

---

(bold added) (Rec. 736 box 4). (3) The concept plan states: The "Mixed Employment Village... [would] serve the daily needs of **adjacent neighborhoods** and Beavercreek Road sub-districts" and the "Main Street... [would] serve the daily needs of **the surrounding area.**" (bold added). Rec. 51, 52.

[16]The City has already approved two annexation applications (without revision) that indicate an intent, consistent with the contested concept plan, to develop large portions of the industrial land with no industrial at all, in violation of the law. The first annexation, called Cordillera A Cascadian Village, of "122 acres", although mostly Title-4 lands from the 2002 expansion, proposes no industrial but "proposes approximately 2 million square feet of commercial development and approximately 1,500 units of residential development." *Graser-Lindsey v. Oregon City.* 56 Or LUBA 504 (2008), p. 3, 22 FN 14. The developer described it, "Half might be residential and half might be pure commercial with no industrial." Rec. 1177. The concept plan only placed "a small area of industrial lands within the proposed annexation" (Rec. 1515) of approximately 20 acres (Findings to Resolution 07-24, p. 4 of 7), but a detention pond (Rec. 723) is shown occupying this potential industrial land. Rec. 306 middle. The second annexation application, called Conservation Community at Thimble Creek (Rec. 1382), which includes the 63-acre 2004 industrial expansion and which was approved by the City Commission, but twice voted down by voters, doesn't include any land planned as industrial. *Graser-Lindsey v. Oregon City.* LUBA 2007-257. Final Opinion and Order and *Kehoe v. Oregon City*, LUBA 2008-169, Final Order and Opinion.

[17] The concept plan anticipates phased development over greater than 20 years. Rec. 48.

[18] ½ (26-acre Mixed Use Village + 10-acre Main Street) and ½ (27.8-acre Low-Impact Development)

[19] 43,560 ft^2/acre is the conversion from Webster's New Collegiate Dictionary, 1975.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

commercial/retail[20] on Title 4 land[21]. (c) Residential completely displaces Title-4 Industrial over an estimated (FN 6) two-thirds or 50 acres or 2,178,000 sq. ft. (FN 19) of the 77-acre East (and a little West) Mixed Use Neighborhood[22]. Rec. 91 Hybrid. (d) Two large annexation applications, located largely on Title-4 Industrial lands, which have proposed projects or developments wholly not industrial and vastly exceeding the commercial limits, have already been approved. FN 16. The concept plan violates Metro Code 3.07 Title 4 particularly 3.07.430 because in it extensive non-industrial uses, not for the workers nor within the sq. ft. limits, displace industrial uses on Title-4 lands, consequently Ordinance 07-1008 must be reversed or remanded.

Oregon City did not "ensure" "the uses described in subsection A" "do not interfere with the efficient movement of freight" as required by Metro Code 3.07.430B, but, instead, such interference is likely given the tens of thousands of new mostly non-industrial vehicle trips per day projected from the development of the concept plan (Rec. 420) due to problems with capacity, levels of service and funding addressed in Assignment of Error 2.

Oregon City failed to ensure land "division yields at least one lot or parcel of at least 50 acres in size" as required by Metro Code 3.07.430 D and Statewide Planning Goal 14[23]. The concept plan states: "There are 51 total properties ranging in size from 0.25 acres to 63.2 acres." Rec. 44. Large ownerships combine properties. Rec. 45, 1781. The City has not addressed preserving large buildable parcels of 50 acres or larger for industrial in

---

[20] The MEV is planned to be 3-5 story buildings (Rec. 34) and MS is to be over 2 stories (Rec. 52), but the areas given reflect the land area only.

[21] The City tallies these jobs (Rec. 90), but they are not industrial nor the type intended by Title 4. FN 26.

[22] The concept plan says, "Jobs in residential areas (Work at home Jobs) estimated at 4%..." (Rec. 90 FN ***) and mentions "live work units" and "in home work options" (Rec. 53), but, by Oregon City Municipal Code 17.04.290, "Home occupation, "an occupation... in connection with... no commodities are sold other than services... includes such occupations as lawyer...", is for professional jobs and is restricted to exclude industrial jobs and the concept plan does not intend to change this. Rec. 1497, 628 (Konkol, Graser-Lindsey).

[23] "The size of the parcels of urbanizable land that are converted to urban land should be of adequate dimension so as to maximize the utility of the land resource...".

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

violation of Metro Code 3.07.430 D and Goal 14.

In conclusion, the city violated Statewide Planning Goal 2 and related law by not maintaining consistency with Metro law and violated Metro Code Titles 4 especially 3.07.430 and 3.07.450 in not planning according to the 2040 Growth Concept design types and the Title-4 map when planning Title-4 Industrial land as commercial and residential. The City's decision is prohibited as a matter of law, so the decision must be reversed. The city also improperly construed applicable law, when it permits residential and commercial to be exclusive users of many industrially-designated parcels whereas the law requires the land to be used industrially with only tiny pockets of commercial of less than 5,000 and 20,000 sq. ft., if at all, and when it fails to ensure limited uses are for workers, to protect freight movement and to protect a 50-acre lot, so this decision must be reversed or remanded.

Subassignment of Error B

The city errs in not providing Findings or evidence or reasons or a correct analysis to demonstrate compliance with Metro Title 4 and Goal 2.

OAR 661-010-0071 2a and 661-010-0072 2a state:

> "(2) The Board shall remand a land use decision for further proceedings when: (a) The findings are insufficient to support the decision... (b) The decision is not supported by substantial evidence in the... record."

Goal 2 requires,

> "The required information shall be contained in the plan document or in supporting documents... The plans shall be the basis for specific implementation measures. These measures shall be consistent with and adequate to carry out the plans."

Although Goal 2 requires consistency of government planning, the City does not include Title 4 in its "Decision–Making Criteria" (Rec. 9-10), nor does it address compliance of the complete concept plan with Title 4[24] nor does it provide evidence of

[24] In discussing its own Comprehensive Plan Criteria, without providing evidence or discussion, the City

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

compliance or reasons or a correct analysis nor can it. The city, as an aside in its discussion of Title 11 E, gives a mere assertion of compliance of one subdistrict with Title 4:

> "The North Employment Campus is to provide for the needed family wage employment that strengthens and diversifies the economy and will be compliant with Metro's Title 4 regulations." Rec. 24 top.

The City's Findings on Title 11 E (Rec. 23-24) do not actually address or replace findings on Metro Ordinance 3.07 Title 4 nor does this aside address compliance of the concept plan besides the one subdistrict.

The City fails to clearly compile and make available the plan's supporting documents ("under separate cover", Rec. 33) as required by Goal 2. Concerning Goal 2, the City concludes, "It contains adequate implementation measures to ensure that upon taking effect (when the implementing zoning is subsequently adopted) sufficient means will carry out the plan." (Rec. 15); however, it does not discuss what the implementing measures are and, in fact, discusses that the Commission has not yet reviewed the implementing measures. FN 2, Rec. 7 bottom, 3. A challenged decision must not become final before compliance with relevant rules is assured. *Concerned Citizens v. Jackson Co.*, 33 Or LUBA 70 (1997).

Local government findings are inadequate when they fail to interpret an applicable regulation and fail to identify facts upon which it relied in reaching its conclusion. LUBA will not overlook such inadequacies in the Findings, when no party cites evidence in the record that compels the interpretation or conclusion made by the local government. *DLCD v. Clatsop Co.*, 31 Or LUBA 90 (1996);

Because the Findings and evidence concerning Title 4 and Goal 2 are insufficient to support the decision, City Ordinance 07-1008 must be remanded.

Subassignment of Error C

---

makes the general, conclusionary assertion: "The Beavercreek Road Concept Plan and regulations are in compliance with Metro's Functional Plan..." Rec. 11.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

The City must comply with Metro's Functional Plan including Metro Code 3.07 Title 11and related law which requires the Growth Concept design type boundaries and regulations to be followed and the City failed to adopt adequate findings.

Goal 14 states: "Establishment and change of the UGBs shall be based on the following:... (2) Demonstrated need for employment...".

Metro Code 3.07.1105 states, "It is the intent of Title 11 that development of areas brought into the UGB implement the Regional Framework Plan and 2040 Growth Concept. Metro Code 3.07.1120 elaborates,

> "The comprehensive plan provisions shall be fully coordinated with all other applicable plans. The comprehensive plan provisions shall contain an urban growth plan diagram and policies that demonstrate compliance with... 2040 Growth Concept design types. Comprehensive plan amendments shall include:...
> A. Specific plan designation boundaries derived from the **general boundaries** of design type designations assigned by the Council in the ordinance adding the territory to the UGB.
> F. **Provision for sufficient** commercial and industrial development for the **needs** of the area to be developed consistent with 2040 Growth Concept design types."

Oregon City Comprehensive Plan states:

> "Policy 2.7.3 **Recognize the design types of Metro's 2040 Growth Concept.** Establish boundaries for ... Industrial areas..."

According to Statewide Planning Goal 2 and related law (as discussed in AOE 1 A), the City must comply with Metro's Functional Plan. As discussed previously, 308 acres of the concept plan are Title-4 Industrial design type of Metro's 2040 Growth Concept. Metro Code 3.07.450, Appendices B and C, 42, 44, 18. Oregon City violated Metro Code 3.07.1120 A and OCCP Policy 2.7.3, because its "comprehensive plan amendments", comprised of the Beavercreek Road Concept Plan, "shall include" "specific plan designation boundaries derived from the general boundaries of design type designations assigned by the Council in the ordinance adding the territory to the UGB", but the concept plan does not

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

follow the general boundaries given by Metro's Employment and Industrial Land Map, but instead only plans a portion of the concept plan (North Employment Campus) as industrial (Rec. 24), which violates Metro Code 3.07.1120 A and must be reversed.

While Metro Code 3.07.1120 F, defines "sufficient ... industrial development" "shall" be provided as meeting "the needs of the area to be developed consistent with 2040 Growth Concept design types" referring to consistency with the Title-4 design type map and to the Goal-14 needs justification acknowledged in the UGB expansion, the City mis-defines "sufficient" as being 120 acres:

> "Metro intended 120 net acres of the concept plan area would be used for employment uses. Metro noted that it was important to fulfill the original intent for providing industrial lands and that there was flexibility for the local process to evaluate creative ways to meet the intent." Rec. 18. "Metro estimated 120 net acres of the concept plan area would be used for employment uses..." Rec. 23, 47.

The city does not provide the source or evidence of the 120-acres number and errors in many ways concerning this number[25] including some accounting sleight of hand:

---

[25] The City claims it had Metro's permission to violate Metro's Code. The City says: "This approach was blessed by David Bragdon, Metro Council President, in a letter dated May 14, 2007 as well as Metro planner Ray Valone in a letter dated March 19. (sic) 2008." Rec. 18, 23. The city errs in interpreting "flexibility" to mean that the "original intent" or the Metro Code can be violated; instead there are many flexible ways to comply with the "original intent" and the Metro Code. The City did not choose to explore or adopt flexible ways to comply, but chose to interpret "flexibility" to mean the City did not need to comply.

Metro President, writing a year and a half before the adoption (Rec. 691), does not give legal advice in his letter, he is not legally able to personally waive a law, and, in expressing his "understanding", he is relying on his consultations with unmentioned others, but, having referred to the City before writing (Rec. 694-696, 697-698 – the City responded to the Hamlet before Metro to whom its letter was sent), he has obtained erroneous information: the 120 acres number was not a target but presumably a buildable land estimate and was for 2002 only with the estimate for 2004 not being included. These errors, made by the City, are addressed.

Metro Planner in his letter to the City (Rec. 566) does not address Metro Code 3.07 Title 4 or the other points above. His letter is not legal advice; he says "the plan...**seem**[s] consistent with Metro policies and regulations" (bold added); he is not qualified to determine the "intent" of a previous Metro Council and he was not in his current position in 2002, and, even if he were, complying with what is purported to have been intended is not compliance with the law; and neither he nor his staff can personally waive Metro Code despite his obvious eagerness for progress on the UGB expansion lands.

In 2002, Metro's intention was to strengthen its industrial land law. Ordinance 02-969B, which expanded the UGB to include Area 26, now part of the concept plan area, as industrial land (Rec. 1537, 1542), states,

> "Analysis of results of local implementation of Title 4 indicates that commercial uses and other non-industrial uses are converting land designated for industrial use to non-industrial use." Rec. 1541.

Therefore Metro adopted "Exhibit F: Amends Metro Code (UGMFP) to increase the efficiency of the use of land within the UGB for industrial use" which includes "3.07.430 Protection of Industrial Areas". Rec. 1527 #5, 1544, 1532-1535.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

(1) The 120-acres number was not Metro's target for employment use[26] but presumably a buildable-land estimate for the new UGB industrial land. The City errors in deciding that, if more lands were buildable within this Growth Concept design type than were estimated by Metro to be, then the additional lands could be diverted to different purposes such as commercial, retail and residential[27]. All the buildable land shown on Metro's Industrial lands map must be developed to be Title-4 compliant, not just the first 120 buildable acres. Appendix B. It was estimated earlier that about 50 and 31.9 acres of buildable Title-4 Industrial land (the southerly part of the 2002 expansion and the 2004 expansion, see AOE 1 A) were diverted to other uses in the concept plan, but instead this land needs to be planned industrially.

(2) The City seems to suggest, such as when it said "about 127 net acres of North Employment Campus (NEC)... is consistent with Metro's intent" (Rec. 18, 23), that it has planned 127 new acres of buildable industrial land to reach a Metro 120-acre target for new land; however, the 120 acres weren't reached solely with either buildable or new industrial land. First, this 127 net acres includes 26 acres of power-line corridor which is not

---

[26] Or, rather, industrial use (Appendix B); the City acknowledged the intent of "providing industrial lands", but it continues to cloudy the distinction between "employment" and Title-4 Industrial. The City considers employment to include any jobs (Rec. 51, 52, 90 43 right; FN 41) rather than distinguishing Title-4 Industrial and Employment jobs from commercial/retail jobs. Metro Code 3.07.430 and 3.07.440. Substantial evidence in the Record distinguishes jobs. FN 39, 41. Rec. 1146, 1176 (Westfall), 1522. Metro defines family-wage jobs as having "an annual income greater than or equal to the average annual in the region." Rec. 1522.

[27] The concept plan describes how the unconstrained industrial 123 acres can be augmented to include constrained land – "useable portion of powerline overlay (50%) 26 [acres]" i.e. one half the "useable" (not canyon) regional powerline corridor where building and even bushy vegetation is not allowed – to yield a gross acreage of 149 acres. Appendix D; Rec. 91 (middle box under hybrid), 863, 1831-1832, 54, 723, 15. The net acreage with roads deducted but still with one half the constrained powerline corridor included is 127 acres. Rec. 90 (hybrid net acres). Various approaches had been tried to include more of the power-line corridor as buildable. Rec. 46 vs. 980 (6-30-07) or 1779 (7-2006). By inflating the industrial in the north, the City intends to divert industrial in the south to other uses.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

buildable. Rec. 91; FN 27. Second, the City substituted about 46.3 **pre-existing** net acres[28] already in the city and/or the UGB for part of the new UGB-expansion Title-4 Industrial net acres when assembling the 127 acres to try to reach the City's erroneous 120-net-acre industrial-lands target[29]. As a result, instead of planning 120 new buildable acres as industrial, as the City seems to suggest, it is planning about 54.7 new buildable acres[30] from the Title-4 Industrial land. Rec. 1505, 1506[31].

(3) Significantly, the Metro 120-acre buildable land estimate was for 2002 only. The city ignores that more Title-4 Industrial land was brought into the UGB in 2004 and it did not include a Metro buildable land estimate for 2004. Petitioner estimated that 30 buildable acres were added to the UGB in 2004 (Rec. 1505, 1506), before the City decided the low impact area was 50% buildable yielding 12 net acres[32] (Rec. 56, 46), so approximately 42 net buildable acres were added in 2004.

About 150 new buildable Title-4 acres (120 + 30 or, as much as, 120 + 42), brought into the UGB in 2002 and 2004, are being planned to yield just 54.7 acres.

Year of UGB Expansion	Growth Concept Design Type	Gross Acres of Expansion	Metro Buildable Land Estimate – A Guess	Yield of Concept Plan of Net Buildable Title-4 Industrial Acres
2002	Industrial	245	120	**54.7**
2004	Industrial	63	30	**0**

Rec. 18, 1505, 1580 ¶2 – 60 acres.

[28] Appendix C shows pre-existing Employment land (50 + 14 acres) and Outer Neighborhood land (2 acres) giving 66 pre-existing acres less 11.5 constrained acres shown at Rec. 46 (3.6 + 1.3) or estimated from Rec. 46 (6.6 acres in two pieces under powerlines, FN 6) yielding 54.5 pre-existing buildable acres. Deducting 15% for local roads yields 46.3 pre-existing net acres.

[29] "There are 7 properties within the concept plan that are currently within the city and zoned campus industrial. These properties were included in the study are and the total acreage of employment lands calculation for the plan included these properties even though they were already in the city." Rec. 721.

[30] That is, 127 - 26 – 46.3 = 54.7

[31] Petitioner revises the 80 acres, as stated at the hearings, downward to 55 acres as explained in the text.

[32] ½ of 27.8 acres less 15% for local roads yields 11.6 acres.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

(4) Although the City consultant's Market Analysis determined that the "large parcels with consolidated ownership" of "flat, buildable, undeveloped land" particularly in "the south half" of the concept plan area were major advantages of this site (Rec. 1781, 1789-1790), because the City was only intent on reaching its minimum 120-acre target of industrial acres, it located the industrial NEC in the north on the least buildable, most dissected part of the site with the regional powerline corridor network, canyons and even a large retention pond. Rec. 36 & 49 blue NEC, Appendices B and C, 46, 724 E3, 723, 785, 863, Appendix D, 1831, 1832, 1147 middle; FN 31. The commercial, retail and residential are planned on flat, buildable land to the south.

The 120-acre target does not define sufficient nor needs, but the "needs of the area" for industrial land are clear as originally demonstrated in 2002[33]. The City in its 2002 letter to Metro explained its need for this land for industrial:

> "1. Creating industrial land and providing jobs within Oregon City.
> "2. Diversifying the city's... residential tax base to generate higher property tax revenues to better serve local public safety, parks, recreation, and library needs...
> "5. Limiting additional housing" Rec. 1517-1519.

Substantial evidence in the record shows the need:

(1) Oregon City's jobs-to-housing ratio is far below the regional average (Rec. 729[34], 2153 ¶5, 1094) which causes it to disproportionately burden the region's failing road network (e.g. Rec. 411, 1871, 1866[35], 1582[36], 1178[37], 1174[38]) as a result of so much

---

[33] OCCP Policy 2.6.1 directed the City to pick enough appropriate land based on market factors, proximity to express ways, and site requirements of specific types of industry, etc.

34 ODOT Reviewer commented on the Concept Plan, "The City's 2030 jobs-housing ratio of 1.52 is only about 10% higher than the 2005 jobs-housing ratio of 1.38. It would still be quite a bit lower than the regional jobs-housing ratio of 1.69." The concept plan falls considerably short of utilizing this opportunity to plan the strong jobs-housing ratio the City needs. Rec. 729 & 1578.

35 Kittleson and Associates, the traffic consultant for the Beavercreek Road Concept Plan, state: "Highway 213 is a major connection to the regional transportation system for residents of Oregon City. Traffic on Highway 214 is highly directional in nature, as it is used heavily by commuters in the a.m. and p.m. peak hours each

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

commuting out of the area (Rec. 1146[39], 42 top right[40], 1497, 1094, 1147, 1172, 854.

(2) As the City explained in 2002, it needs to diversify its tax base. Rec. 1517. Dan Drentlaw, City Community Development Director, and Gary Barth, Deputy Director of Business and Community Service for Clackamas County, concurred that industrial tends to generate revenues while housing stresses public services. Rec. 1156, 1146[41].

(3) The lack of business with good jobs has lead to Oregon City's budget woes impacting its ability to provide fire service, police service, a pool, a library and so forth making the problem of an adequate business tax base of great importance. Rec. 1516, 1152-1154[42], 1176 Mr. O'Brien, 1148 top[43].

---

weekday, with congestion occurring during both peak periods." Rec. 1866, Appendix E.

36 Kittleson and Associates, Inc., the traffic consultant for the Beavercreek Road Concept Plan, indicate that even without development at the concept plan location, $75 to 125 million in road improvements are needed to Highway 213 which is one of Oregon City's two routes of access to Highway 205 which connects Oregon City to regional jobs. Rec. 1582.

37 City Commissioner confirmed "the failure of Hwy 213 and Beavercreek Road" and "What had to be addressed was the flow of traffic onto Hwy 213 from Beavercreek Road." Rec. 1178.

38 Ms. Kosinski said, "Hwy 213 was failing" and "Beavercreek Road was at capacity. There was only one major and one minor arterial to serve this entire area." Rec. 1174, 1150.

39 Gary Barth, Deputy Director of Business and Community Services for Clackamas County, said, "Clackamas County [where Oregon City is located] has long been a net exporter of labor and talent, a bedroom community and was working hard to reverse that trend a bit to balance jobs, even though housing was growing dramatically." Rec. 1146.

40 The concept plan states: "There are relatively limited employment centers within this area of Oregon City and Clackamas County. This imbalance of jobs and housing contributes to Clackamas County's pattern of approximately 60% of the work force traveling outside the County to work." Rec. 42 top right.

41 Gary Barth, Deputy Director of Business and Community Services, said, "Service sector type job growth in Clackamas County would bring a lot of housing and below living wage income, which would continue to stress public services. The growth of strong development is needed; where light industrial, commercial and intellectual type jobs with higher than average living wages increase the citizens' net worth and give them more capacity to help provide for the essential public services of a community." Rec. 1146.

42 Planning Commissioner Dunn said, "There were shortcomings not only to police, fire and library services mentioned, but also regarding City services. Anyone touring the building would know City Hall was deficient as well." Rec. 1152. There was consensus among other Planning Commissioners that such services were failing. Rec. 1152-1154.

43 Elizabeth Graser-Lindsey said, "problems exist involving poor response times and the City's ability to stay

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

(4) The record indicates local demand for industrial land that remains and that the City is not addressing. Rec. 1579[44], 1510-1511[45], 1098[46], 1110-1122, 1501[47].

(5) The Findings say, "employment lands… are greatly needed" (Rec. 13).

(6) This land was selected for a 20-year planning horizon, so it is not surprising if the land need has not fully materialized in the first 5 years since 2002 just as Metro's 20-year population forecast hasn't yet either.

(7) This land was not selected solely to meet Oregon City's industrial needs, but also the Goal-14 demonstrated need of Clackamas County and Metro

Although the property owners and developers clearly did not want this property zoned industrial (Rec. 803[48], 894, 719, 47[49], 1177, 1039), the City has not shown nor adopted Findings that the Metro Industrial land is not all needed to meet the industrial "needs of the area" and substantial evidence in the Record indicates it is needed.

The City selected an erroneous acreage target and the City's concept plan does not select" sufficient" industrial land to meet "the needs of the area" nor comply with the design type boundaries and regulations, but planned the industrial land for other uses in violation of the law and the Findings are inadequate to show compliance with Metro Code 3.07 Title 11 especially 3.07.1120 F. Rec. 23-24. This constitutes a "bait and switch" where the City asked for industrial acres, but its concept plan diverts them to other uses. In conclusion, the

---

in the fire district. Also, the library was not funded for a good part of one year, and was only held open a few hours by the County. The pool has also been threatened to be closed many years, which is where many area children, including her own, learn to swim." Rec. 1148 top, 1172:29-30.

[44] Coldwell Banker broker Kathy Berge wrote, "I am greatly concerned about the lack of property zoned General Industrial for use by family owned/locally owned businesses." Rec. 1579.

[45] One Real Estate broker said, "This city has currently been rezoned so that there is no place to build a new auto service garage. I have been involved with several… business owners who are looking for just such property." Rec. 1510-1511.

[46] "My business is a Dump Truck company… we require appropriately zoned land… we have had a difficult time finding affordable property in the Oregon City area." Rec. 1098.

[47] "Local businesses continue saying they cannot find industrial land that meets their needs." Rec. 1501.

[48] "My family and I do not want any of the Hall Family land to be zoned industrial." Rec. 803.

[49] The concept plan describes opposition to industrial during the planning: " The advice ranged… to strong opposition [to industrial lands] based on shorter term market factors and locations considerations." Rec. 47.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

concept plan violates Metro Code 3.07 Title 11, Goals 2 and 14, and OCCP 2.7.3 and consequently the decision must be reversed.

Subassignment of Error D

The City misapplied Metro's residential densities to industrial land.

Metro Code 3.01.040 says,

> "(a) Land added to the UGB by legislative amendment… or by major amendment… shall be subject to the requirements of Title 11, Planning for New Urban Areas, of the Urban Growth Management Functional Plan…" and
> "(b) …when the Council adopts a legislative or major amendment to the UGB, the Council shall:…
> (2) Establish the 2040 Growth Concept design type designations applicable to the land added to the UGB, including the specific land needed, if any, that is the basis for the amendment. **If the design type designation authorizes housing**, the Council shall designate the land to allow an average density of **at least 10 units per net developable acre or such other density that is consistent with the design type.**" (bold added)

Metro Code 3.07.170 A gives the Design Type Density Recommendations:

> "Employment Areas – 20 persons per acre, Industrial Areas – 9 employees per acre, Outer Neighborhoods – 13 persons per acre."

Metro Code 3.07.1120 C states,

> "Provision for average residential densities of at least 10 dwelling units per net developable residential acre or such other densities that the Council specifies pursuant to section 3.01.040 of the Urban Growth Management Functional Plan."

The City states,

> "The concept plan is required to comply with Metro's title 11 requirements regarding residential density". Rec. 9.
> "Based on the proposed densities, the plan has an estimated capacity of approximately 1,000 dwellings, which is approximately 10.3 dwellings per net developable acres. The Commission finds this requirement is satisfied." Rec. 22.

Because Metro Code only specifies residential densities "if the design type designation authorizes housing" (Metro Code 3.01.040) and the Code specifies "other [non-residential] densities" when the design type is not housing, the City errors when it mis-applies Metro's

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

residential densities to land with an industrial design type rather than Metro's industrial densities when it detemines compliance with Title 11. The City's decision must be reversed.

Subassignment of Error E

Oregon City in adopting the Beavercreek Road Concept Plan is not complying with Statewide Planning Goals 2, 3, 4 and 14, OAR 660-09, Metro Ordinances 02-969 B and 04-1040 B, OCCP Goals 2.6, 14.1, Policies 2.6.1, 2.7.3, 14.1.1 and 14.1.2 and related law which govern the Urban Growth Boundary expansion process of which this concept plan and city comprehensive plan amendment are to be part, because the city is not planning the 2002 and 2004 expansion land as industrial although the expansion process selected, justified, acknowledged and designated the design type of this particular land on the basis of demonstrated industrial need only, so, consequently, this land must now be planned in accord with the original industrial justification as shown by Statewide Planning Goal 2 and similar laws discussed in Subassignment of Error 1. The City's Findings were inadequate to demonstrate compliance. The City acted outside its jurisdiction when state law has UGB expansion and determination of needs and land supply under Metro's jurisdiction.

Statewide Planning Goal 14 says[50]:

> "Urban growth boundaries shall be established to identify and separate urbanizable land from rural land. Establishment and change of the boundaries shall be based upon considerations of the following factors:
> (1) Demonstrated need to accommodate long-range urban population growth requirements consistent with LCDC goals;
> (2) Need for housing, employment opportunities, and livability;...
> The results of the above considerations shall be included in the comprehensive plan. In the case of a change of a boundary, a governing body proposing such change in boundary separating urbanizable land from rural land, shall follow the procedures and requirements as set forth in the Land Use Planning goal (Goal 2) for goal exceptions."

[50] Goal 14 Applicability Provisions (1) (b) allows the City to use the old rules since the UGB evaluation was initiated prior to April 28, 2005. The City does not discuss if it is using the old or new rules, which are similar in this part. The City does not discuss if it is using old or new rules which are similar in this part.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

OCCP gives further guidance:

> "Goal 2.6 Ensure an adequate supply of land for major industrial employers with family-wage jobs."
>
> "Policy 2.61 Work with Metro to ensure that there is enough land available within the Urban Growth Boundary to meet the need for industrial... development..."
>
> "Policy 2.7.4 Recognize the design types of *Metro's 2040 Growth Concept*..."
>
> "Goal 14.1 Establish and amend when appropriate, the Urban Growth Boundary... that contains sufficient land to accommodate growth during the planning period for a full range of city land uses, including... industrial..."
>
> "Policy 14.1.1 The Urban Growth Boundary shall conform to Title 11... and will provide sufficient land to accommodate 20-year urban land needs..."
>
> "Policy 14.1.2 Concept Plans... will be required prior to development..."

Metro Ordinances 02-969B and 04-1040B describe process and subsequent requirements.

Goal 14 requires that, when expanding an UGB, Metro go through the "exceptions" process of Goal 2, Part II.. That is, Metro had to take an exception to Goals 3[51] and 4 to bring rural land inside the UGB and urbanize it. To bring THESE pieces of land in, Metro therefore had to show there was (1) a need for the land -- which here they justified as an industrial need, (2) that no alternative areas existed to meet this industrial need, inside or outside the UGB, that had less impact on agriculture lands, forest lands, etc. This land was NOT analyzed as to its ability to meet a residential need. Rec. 1526, 1537, 1538, 1540, 1542 called area 26 by Metro, Rec. Item Retained B Metro Ordinances 02-969B and 04-1040B (CD). Finally, Metro had to show the UGB expansion met Goal 14, including that this site met factors 3-7 of Goal 14, which again, was based on a need for industrial land. So as an example, Goal 14, factor 7, requires showing that the site is compatible with, or can be made compatible with, surrounding farm land. Making that evaluation for future industrial use is a different analysis than doing it for residential use: Metro separately analyzed for

[51] The 2004 UGB expansion brought in TBR lands. Appendix F.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

population, commercial and industrial land need. Metro Ordinances 02-969B and 04-1040B; Metro Code 3.01.015 and 3.01.020, OAR 660-009; Rec. 1523[52], 1536[53], 1540[54] (for 2002) and 1545-1556 (for 2004), Rec. 1514.

In 2002, in its every-5-year UGB expansion process, Metro determined it needed more land for industrial uses within the UGB to accommodate the region's forecasted industrial land need[55] to the year 2022 and it brought land from outside the UGB into the UGB based on a legally-prescribed process which required the land be selected and justified for industrial use and acknowledged by the state as described in Statewide Planning Goals 2, 3, 4, and 14. 245 acres demonstrated to meet a need for industrial land in 2002 are in the Beavercreek Road Concept Plan area. Metro Ordinance 02-969B; Rec. 1538 from 1523-1544, 1514. Metro Code 3.01.015 and 3.01.020, ORS 197, 215, 268, 527; OAR 660-015-0000(1)-(14); Appendix C. During the acknowledgment process, LCDC determined that in 2002 Metro erred in not selecting enough industrial land to meet its needs assessment, so LCDC issued its "Partial Approval and Remand Order 03-WKTASK-001524" and in 2004 Metro undertook a solely industrial land expansion to correct this industrial land shortage and brought in more industrial land, 63 acres of which is in the Beavercreek Road Concept Plan area. Metro Ordinance 04-1040 B; Rec. 1545-1558 especially 1546, 1524.

Planning for lands brought into the UGB must comply with the legally-prescribed process which justified the expansion and brought the lands in and must remain in

---

52 Metro provided for population/dwelling units and employment/jobs separately. Rec. 1523.
53 Study areas were analyzed separately for inner and outer neighborhoods (IN and ON), employment (EMP) and industrial (IND). Rec. 1536 and Item Retained B, 1538.
54 Metro's "Need for Land" indicated there was "a surplus of land (759.6 acres) for commercial employment and a deficit of land (5,684.9 acres) for industrial development." Rec. 1540.
55 Although residential land was also selected in the 2002 Metro Urban Growth Boundary expansion, the 2002 and 2004 UGB expansion land in the concept plan area was all selected as industrial. Rec. 18; Items Retained B Metro Ordinances 02-969 B and 04-1040B (CDs). "The lands within the Beavercreek Road Concept Plan area were brought into the UGB to help address the lack of industrial and living wage jobs within Oregon City." Rec. 1514.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

compliance with the laws governing that process which established how the land must be used after its inclusion. As described in AOE 1 A, Statewide Planning Goal 2 requires consistency among the planning decisions. The string of decisions from Metro's justification and expansion of the UGB to the planning, zoning and using of this land must be consistent with and based on the same substantial evidence and "shall be included in the comprehensive plan." Goal 14, OAR 660-009-0025. The City is required to plan and keep this land in compliance with Metro Ordinances 02-969B and 04-1040B and Metro Title 4.

LUBA has repeatedly found that land must be used as it was justified. Where an amendment to a city's UGB is proposed in order to achieve a particular mix of uses and population, the amendment must be conditioned on zoning and developing the subject property to achieve the desired result. *Concerned Citizens v. Jackson County*, 33 Or LUBA 70 (1997). Where a city's decision to almost double its UGB relies on a study assuming a particular combination of uses in the UGB expansion area, the city must ensure the plan designations and zoning districts applied to land within the UGB expansion area will accommodate those uses. *1000 Friends of Oregon v. City of North Plains*, 27 Or LUBA 372 (1994). When adopting post-acknowledgment plan and zone map amendments affecting... designated land within an urban growth boundary, a local government must demonstrate that it continues to satisfy its Goal... obligation to maintain an adequate inventory of buildable lands. *Opus Development Corp. v. City of Eugene*, 28 Or LUBA 670 (1995). LUBA concluded similarly in *Collins v. Klamath County*, 26 Or LUBA 434 (1994) and *Penland v. Josephine County*, 29 Or LUBA 213 (1995). Consequently, Oregon City's UGB expansion for more industrial land must be followed by the concept plan ensuring the UGB expansion accommodates that use and maintains adequate industrial land.

To request land for one purpose and then to attempt to use it for another purpose is a

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

"bait and switch"[56]. To plan or zone the land for something other than industrial violates Goal 2, 14, 3, and 4, Metro Ordinance 02-969B and 04-1040B and other applicable law and is prohibited as a matter of law and the decision must be reversed.

The City discusses its obligations under Statewide Planning Goal 14 and related law:

> "This goal [14] essentially defines the purpose of the concept plan. Oregon City's Urban Growth Boundary was expanded in 2002 and 2004 through Metro's regional review process to include more industrial land. This was the result of a demonstrated need for additional land to accommodate a deficiency in available, vacant industrial lands. The revised element of the updated plan calls for implementing Metro's 'concept plan' requirements under Title 11 of the Functional Plan that will result in subarea planning of new areas added to the UGB... while monitoring the supply of land to ensure its adequacy to accommodate growth." Rec. 21.

The City did not quantify the demonstrated need for industrial land or its monitoring of the industrial land supply nor did it include the needs justification in the concept plan nor did the City explain how it planned the expansion areas in keeping with the demonstrated need[57,58]. The city did not identify the facts it relied on in reaching its decision nor explain its basis, analysis or evaluation; the finding regarding Goal 14 was conclusionary. Hence,

---

[56] The legally-prescribed process of bringing lands into the urban growth boundary selects and justifies lands for specific purposes. If the regional need were believed to have changed and this land were no longer needed as Industrial Land, Metro would need to go through the Needs Analysis process again and demonstrate that the land is no longer needed as industrial land. The land could then be put back out of the UGB. If Metro were to believe that this land were needed as commercial or residential rather than as industrial land, Metro would need to go through a Needs Analysis to demonstrate this land should be included on a new basis in an official amendment. Goals 2, 3, 4, and 14.

These lands would not quality for such a change in demonstrated need even if the legal process were followed (AOE 1 C second half) and such a process has not been followed. These lands have only been justified for industrial use and must be planned as industrial during concept planning.

[57] The Findings are opaque and difficult to understand: "The revised element of the updated plan calls for implementing Metro's 'concept plan' requirements under Title 11 of the Functional Plan that will result in subarea planning of new areas added to the UGB." (Rec. 21), but seem to suggest that the "'concept plan' requirements" collapsed into "subarea planning" where one subarea will comply.

[58] The closest the City gets to quantifying demonstrated need in the concept plan (Rec. 29-91) is referencing "Metro 2002-2022 Urban Growth Report: An Employment Land Need Analysis" and mentioning "Metro's employment land needs analysis reports that about 9,300 net acres of industrial land is needed between 2002 and 2022, of which, approximately 6,300 net acres must be vacant and that the region has a shortage of large and small industrial lots", but not one local needs number, such as justified this land, is cited. Rec. 75 FN **, 90 FN **, 17.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

the City did not comply with Goal 14, 2, 3, 4[59], Metro Ordinances 02-969 B or 04-1040 B, OAR 660-009-0025 and other relevant law and the findings are inadequate to show compliance and hence the decision must be remanded.

State law such as ORS 268.354, 197.296-197.302 and 195.020 (1) establish that urban growth boundary changes and related analyses and determination of buildable land supply are subject to the jurisdiction of Metro. Rec. 1523; Metro Code 3.01.015 (a). For Oregon City to unilaterally attempt to skip the relevant process; neglect the land supply analysis and determination, and plan this land for other than its Metro-justified and designated and LCDC-acknowledged purpose is to illegally exceed its jurisdiction. The City erred by acting outside its jurisdiction, and, consequently, this decision must be reversed.

For all these reasons, the City's concept plan decision must be reversed or remanded.

Subassignment of Error F

The City overlooks and violates its own Comprehensive Plan provisions concerning industrial land, its protection, this specific location and coordination with Metro; the City failed to adopt findings concerning the applicable laws.

Oregon City's Comprehensive Plan (OCCP) guides concept planning of this site:

> "There is often pressure to convert industrially zoned land to easily developable sites and other uses. The goals of the City are to **protect existing industrial land from conversion**, where appropriate, to annex industrial land and expand the Urban Growth Boundary to add urbanizable industrial land to the inventory, and to ensure that public facilities can serve future development." (bold added) OCCP p. 13.
>
> Goal 2.6 "**Ensure an adequate supply of land for major industrial employers with family-wage jobs.**" (bold added)
>
> Policy 2.6.1 "**Work with Metro to ensure that there is enough land available within the Urban Growth Boundary to meet the need for industrial...**"

[59] The City finds that neither it nor its UGB contains resource land due to both being urban. Rec. 15. The Timber land brought into the UGB through the exception process must be used as justified regardless of when zoning changes relative to an UGB expansion.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

Policy 2.6.2 "**Ensure that land** zoned or planned **for industrial use is used for industrial** purposes, and that exceptions are allowed only where some other use **supports** industrial development. New non-industrial uses should especially be restricted in already developed, active industrial sites." (bold added)

Policy 2.6.3 "**Protect** the city's supply of undeveloped and underdeveloped land zoned for industrial uses by limiting non-industrial community uses, such as schools, parks, and churches on such properties and by limiting larger commercial uses within those areas." (bold added)

Policy 2.6.4 "**Protect** existing and planned undeveloped and underdeveloped industrial lands from incompatible land uses, and minimize deterrents to desired industrial development." (bold added)

Policy 2.6.8 "Require lands **east of Clackamas Community College** that are designated as Future Urban Holding to be the subject of concept plans, which if approved as an amendment to the Comprehensive Plan, would guide zoning designations. The **majority** of these lands should be designated in a manner that encourages **family-wage jobs** in order to generate new jobs and move towards meeting the city's employment goals." (bold added)

Policy 2.7.1 Maintain a sufficient land supply within the city limits and the Urban Growth Boundary to meet local, regional, and state requirements for accommodating growth.

The City's Comprehensive Plan, in the seven goals and policies and additional text above, emphasizes the necessity of protecting industrial land from non-industrial uses, minimizing deterrents to industrial development, and ensuring there is a "sufficient" and "adequate" supply and "enough" land, but the Beavercreek Road Concept Plan fails to comply with the City's own law by failing to plan or to protect much of the industrial land as industrial or to ensure a sufficient supply to meet demonstrated need. (See AOE 1 A, 1 C). For this reason alone, the decision must be reversed or remanded.

Both OCCP Policy 2.6.8, concerning the concept plan area, "east of Clackamas Community College" (Rec. 42, 49 oval track to NW), and Goal 2.6, "ensure... adequate... land... for family-wage jobs", highlight family-wage jobs, but the City fails either to ensure adequate land for them or to "designate" a "majority of these lands" "in a manner that

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

encourages family-wage jobs". "Family-wage jobs" are "a permanent job with an annual income greater than or equal to the average annual in the region" (Rec. 1522); they are not retail. (FN 26, 41) When the City fails to distinguish type of job (Rec. 90), it violates Policy 2.6.8 and Goal 2.6. As was previously argued (AOE 1 A and 1 C) the amount of Title-4-compliant Employment and Industrial land planned is neither a "majority" of the site[60] nor "adequate" which Metro defined by the Title-4 designations, consequently the City failed to demonstrate compliance or to comply with Policy 2.6.8 and Goal 2.6.

OCCP Policy 2.6.2 provides that "exceptions are allowed only where some other use **supports** industrial development"; however, it was argued previously (AOE 1 A second half) that, in the absence of implementing measures, the substantial evidence in the record shows the other uses will not support industrial development and the plan violates Policy 2.6.2. The concept plan does not comply with OCCP p. 13, Goal 2.6 and 2.7 and related policies. Consequently Oregon City Ordinance 07-1008 must be reversed or remanded.

The City failed to adopt findings to address or explain its Plan regulations except OCCP p. 16 and for this reason, the decision must be remanded. Rec. 9- 10.

Subassignment of Error G

The City failed to comply with Statewide Planning Goal 9 and OAR 660-009 or to adopt adequate finding on Division 9.

Goal 9 states:

> "Comprehensive plans and policies shall contribute to a stable and healthy economy in all region of the state. Sueh plans shall be based on inventories of areas suitable... Comprehensive plans for urban areas shall:...
> 3. Provide for at least an adequate supply of sites of suitable sizes, types, locations, and service levels for a variety of industrial and commercial uses consistent with plan policies;

[60] The 175-gross-acre North Employment Campus is not a majority of the 453-acre site, half of which is 227 gross acres; neither are 123 unconstrained acres the majority of the concept plan area's 292 unconstrained acres with or without the 14 acres of low impact development. Rec. 45, Appendix C.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

4. Limit uses on or near sites zoned for specific industrial and commercial uses to those which are compatible with proposed uses.

OAR 660-009 states:

> OAR 660-009-0015... Cities... must review and... amend their comprehensive plans to provide economic opportunities analyses containing the **information** described in sections (1) to (4) of this rule. This analysis will compare the demand for land for industrial and other employment uses to the existing supply of such land.
> (2) ... The economic opportunities analysis must identify the number of sites by type reasonably expected to be needed to accommodate the expected employment...
> (3) ... Comprehensive plans for all areas within urban growth boundaries must include an inventory of ... lands within the planning area designated for industrial...
>
> OAR 660-009-0025... Cities... must adopt measures adequate to **implement** policies adopted pursuant to OAR 660-009-0020. Appropriate implementing measures include amendments to plan and zone map designations, land use regulations...
> (1) ... The Plan must identify the approximate number, acreage and site characteristics... needed to accommodate industrial... uses to implement plan...
> (2) ... Plans must designate serviceable land suitable to meet the site needs identified in section (1) of this rule. ...the total acreage of land designated must at least equal the total projected land needs for each industrial or other employment use category identified in the plan during the 20-year planning period."

The City failed to plan an adequate supply of industrial land and to limit incompatible uses as required by Goal 9 and as was discussed in AOE 1 A and 1 C. The City also failed to compare inventoried industrial sites and the demonstrated need for industrial lands or to adopt implementation measures[61] or add an amendment to the comprehensive plan to identify and designate needed industrial sites for the 20-year planning period as was discussed in AOE 1 E concerning Goal 14 and OAR 660-09-0025. The City must demonstrate it remains in compliance with Goal 9. Opus Development v. City of Eugene, 28 Or LUBA 670, points 8 and 9. In addition, the necessary inventory is not seen in the concept plan or record and the Findings for Goal 9 state the consultant inventoried the market conditions rather than the land[62]. Rec. 17. The Findings do not

[61] Concurrency implementation measures appear necessary. AOE 1 A second half. Industrial land would appear to need the type of implementation measures given at Rec. 1094.
[62] The report, "Beavercreek Road Concept Plan Market Analysis", and doesn't claim to detail "the supply of

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

discuss or analyze the consultant's vague 20-year build-out projection ("it is not unreasonable to expect 150 acres of industrial and business park development"[63]) nor compare it with Metro's demonstrated need for the entire UGB expansion (which is also "not unreasonable to expect") nor explain why only 127 acres is planned and designated as industrial nor do the Findings state how the demonstrated need will be met. Rec. 17-18.

The City violated Statewide Planning Goal 9 and OAR 660-009 and failed to provide adequate findings, and its decision must be reversed.

SECOND ASSIGNMENT OF ERROR

Oregon City Erred In Adopting Oregon City Ordinance 07-1008 Which Violated Relevant Laws Such As Statewide Planning Goals 11 and 12, OAR 660 Divisions 9, 11 and 12, Metro Code 3.07.1120, OCCP Goals 2, 5, 11 and 14 and Related Policies When It (1) Failed To Provide Or Reference A Conceptual Transportation Plan, Conceptual Public Facilities And Services Plan Including Parks, Police, Fire And Solid Waste, A Conceptual School Plan, And A Natural Resource Protection Plan That Would Serve The Site And Integrate It With Other Plans; (2) Failed To Estimate When Each Planned Public Facility Project Will Be Needed, What The Trigger Would Be Such As Population Level, Service Level Standards, Date And Provide Detailed Strategies For Preparing The Total Land Supply; (3) Failed To Provide Rough Cost Estimates For Some Public Facilities And Services Such As Parks, Police And Fire And Part Of Transportation; (4) Failed To Adequately Evaluate The Ability Of Potential Funding Mechanisms To Fund The Development, To Discuss Local Fiscal Policies, And To Evaluate Likely Financing Approaches; To Coordinate With Its Capital Improvement Program Or Discuss How The Concept Plan Would Be Integrated Into It; And To Ensure Measures Will Be In Place To Ensure Cost Is Borne By The Developer; (5) Failed To Consider, Evaluate, Plan Implementation Approaches Or Otherwise Ensure Extension Of New Services Does Not Diminish Delivery Of Those Same Services To Existing Areas And Residents In The City As A Whole Where Substantial Evidence In The Record Indicates That Delivery Of Services To The Existing City As A Whole Will Be Diminished; (6) Failed To Show Compliance With Findings Of Resolution 07-24 Which Deferred Annexation Compliance To The Concept Plan As Decided By *Graser-Lindsey V. Oregon City*; (7) Failed To Comply With Statewide Planning Goals 5 And 7; (8) Failed To Provide The Basis For Specific Implementation Measures; (9) Failed To Be Able To Plan Public Services Properly While The Uses Are Unknown, Due To Being Contested, As Decided In

---

industrial, commercial and office land" nor does it do so contrary to what the City finds. Rec. 1781-1808, 17.

[63] This conclusion followed the assumption, " Assume, arbitrarily, that 1/3 of the acres are developed residentially. That would leave about 150 buildable acres for employment..." Rec. 1798.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

***1000 Friends Of Oregon V. North Plain*; And (Throughout) Failed To Provide Adequate Findings.**

Statewide Planning Goal 2 states:

> "All land use plans shall include identification of **issues and problems**, inventories and other factual information for each applicable statewide planning goal, evaluation of alternative courses of action and ultimate policy choices, taking into consideration social, economic, energy and environmental needs. The required information shall be contained in the **plan document or in supporting documents** and implementation ordinances shall be filed in a public office or other place easily accessible to the public. The plans shall be the **basis for specific implementation** measures. These measures shall be consistent with and adequate to carry out the plans. Each plan and related implementation measure shall be coordinated with the plans of affected governmental units." Goal 2 Part I – Planning.

Statewide Planning Goal 5 states: " To protect natural resources… Local governments shall adopt programs that will protect natural resources…" Goal 7 states: "To protect people and property from natural hazards… Local governments shall adopt comprehensive plans… to reduce risk to people and property from natural hazards… **landslides**…"

Statewide Planning Goal 11 states:

> "To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development. …A provision for key facilities shall be included in each plan. Cities … shall develop and adopt a **public facility plan** for areas within an urban growth boundary… To meet current and long-range needs, a provision for **solid waste** disposal sites, including sites for inert waste, shall be included in each plan."

Statewide Planning Goal 12 states:

> "To provide and encourage a safe convenient and economic transportation system. A transportation plan shall (1) consider all modes of transportation…; (2) be based upon an **inventory of local, regional and state transportation needs**…(8) **facilitate the flow of goods and services** so as to strengthen the local and regional economy; and (9) **conform** with local and regional comprehensive land use plans."

OAR 660 Division 11 states:

> "660-011-0010 The Public Facility Plan
> (1) The **public facility plan** shall contain the following items:
> (a) An inventory and general assessment of the condition of all the significant public facility system… designated in the acknowledged comprehensive plan;

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

(b) A list of the significant public facility projects… descriptions or specifications…;
(c) Rough cost estimates of each public facility project;
(d) A map or written description…;
(e) Policy statement(s) or urban growth management agreement identifying the provider of each public facility system…;
(f) **An estimate of when each facility project will be needed**; and
(g) A discussion of the provider's existing funding mechanisms and the **ability** of these and possible new mechanisms **to fund** the development of each public facility…
(3) It is not the purpose of this division to cause duplication of or to supplant **existing applicable facility plans and programs**. Where all or part of an acknowledged comprehensive plan, facility master plan…, capital improvement program, regional functional plan, similar plan… meets… the requirements of this division, those **plans… may be incorporated by reference into the public facility plan** required…"

"660-011-0015 Responsibility for Public Facility Plan Preparation
(1) Responsibility for the preparation, adoption and amendment of the public facility plan shall be specified within the urban growth management agreement…
(2) The jurisdiction responsible… shall provide for the coordination …" (bold added).

OAR 660 Division 12 states:

"OAR 660-012-0040 Transportation Financing Program
(1) For areas within an urban growth boundary containing a population greater than 2,500 persons, the TSP shall include a transportation financing program.
(2) A transportation financing program shall include the items listed in (a)-(d)
(a) A list of planned transportation facilities and major improvements;
(b) A general estimate of the timing…;
(c) A determination of rough cost estimates…; and
(d) In metropolitan areas, policies to guide selection … for funding…"

"OAR 660-012-0060 Plan and Land Use Regulation Amendments
(1) Where an amendment to a functional plan, an acknowledged comprehensive plan… would significantly affect a… transportation facility, the local government shall put in place measures as provided in section (2) of this rule to assure that allowed land uses are consistent with the identified function, capacity, and performance standards (e.g. level of service, volume to capacity ratio, etc.) of the facility. A plan or land use regulation amendment significantly affects a transportation facility if it would:…
(c) As measured at the end of the planning period…:…
(B) Reduce the performance of an existing or planned transportation facility below the minimum acceptable performance standard identified in the TSP or comprehensive plan:…
(2) Where a local government determines that there would be a significant effect, compliance with section (1) shall be accomplished…"

Metro Code 3.07.1120 says:

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

"All territory added to the UGB as either a major amendment or a legislative amendment pursuant to Metro Code Chapter 3.01 shall be subject to adopted comprehensive plan provisions consistent with the requirements of all applicable titles of the Metro Urban Growth Management Functional Plan and in particular this Title 11. The comprehensive plan provisions shall be fully coordinated with all other applicable plans…Comprehensive plan amendments shall include:

G. A **conceptual transportation plan** consistent with the applicable provision of **the Regional Transportation Plan…** The plan shall, consistent with OAR Chapter 660, division 11, included preliminary cost estimates and funding strategies, **including likely financing approaches**.

H. Identification and mapping of areas to be protected from development due to fish and wildlife habitat protection, water quality enhancement and mitigation, and natural hazards mitigation… A **natural resource protection plan…** shall be completed as part of the comprehensive plan and zoning for lands added to the Urban Growth Boundary... The plan shall include zoning strategies to avoid and minimize the conflicts… the plan shall also include a preliminary cost estimate and funding strategy, including **likely financing approaches..** to ensure that all significant natural resources are protected.

I. A **conceptual public facilities and services plan** for the provision of sanitary sewer, water, storm drainage, transportation, **parks and police and fire protection**. The plan shall, consistent with OAR Chapter 660, Division 11, include preliminary cost estimates and funding strategies…

J. A **conceptual school plan** that provides for the amount of land and improvements needed, if any, for school facilities on new or existing sites that will serve the territory added to the UGB. The estimate of need shall be coordinated with the affected local governments and special districts…

M. The plan amendments shall be coordinated among the city, county, school district and other service districts."

The Clackamas County-Oregon City Urban Growth Management Agreement states:

"2. Comprehensive Planning, Plan Amendments and Public Facilities Planning...

A. …CITY shall be responsible for preparing all legislative comprehensive plan amendments in the UGMB [Urban Growth Management Boundary]…

B. CITY shall be responsible for the preparation, adoption, and amendment of the public facility plan within the UGMB required by OAR Chapter 660, Division 11, Public Facilities Planning…" Appendix Local Laws.

Oregon City Comprehensive Plan provides rules relevant to the concept plan:

Policy 2.6.7 "Establish priorities to ensure that adequate public facilities are available to support the desired industrial development."

Policy 5.4.5 "Ensure that riparian corridors along streams and rivers are conserved…"

Policy 5.4.7 "The City shall encourage preservation over mitigation when making decisions that affect wetlands and a "no net loss" approach to wetland protection."

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

Policy 5.4.14 "Comply with federal and state regulations for protecting, conserving and restoring threatened and endangered species and critical habitat."

Policy 5.4.16 "Protect surface water quality by:

- Providing a vegetated corridor to separate protected water features from development..."

Goal 11.1 Provision of Public Services
"Serve the health safety, education, welfare, and recreational needs of all Oregon City residents through the planning and provision of adequate public facilities."

Policy 11.1.1 "Ensure adequate public funding for the following public facilities and services, if feasible:

- Transportation infrastructure
- Wastewater collection
- Stormwater management
- Police protection
- Fire protection
- Parks and recreation
- Water distribution
- Planning, zoning and subdivision regulation
- Library services
- Aquatic Center
- Carnegie Center
- Pioneer Community Center
- City Hall
- Buena Vista House
- Ermatinger House"

Policy 11.1.7 "Develop and maintain a coordinated Capital Improvement Plan that provides a framework, schedule, prioritization, and cost estimate for the provision of public facilities and services within the City... and its Urban Growth Boundary."

"Concept plans must include a conceptual transportation plan; natural resources protection plan to protect areas with fish and wildlife habitat, water quality enhancement and mitigation and natural hazards mitigation; a conceptual public facilities and services plan for wastewater, water, storm drainage, transportation, parks and police and fire protection, and a conceptual school plan." p. 118

Goal 14.3 Orderly Provision of Services to Growth Areas "Plan for public services to lands within the Urban Growth Boundary through adoption of a concept plan and related Capital Improvement Program, as amendments to the Comprehensive Plan."

Policy 14.3.2 "Ensure that the extension of new services does not diminish the delivery of those same services to existing areas and residents in the city."

Policy 14.3.4 "Ensure the cost of providing new public services and improvements to existing public services resulting from new development are (sic) borne by the entity responsible for the new development to the maximum extent allowed under state law for Systems Development Charges."

Goal 14.4 "Annex lands to the city through a process that considers the effects on

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

public services and the benefits to the city as a whole..."

Policy 14.4.2 "Include an assessment of the fiscal impacts of providing public services to unincorporated areas upon annexation, including the costs and benefits to the city as a whole as a requirement for concept plans."

Subassignment of Error 1

Oregon City erred in failing to provide or reference a conceptual transportation plan, conceptual public facilities and services plan including parks, police, fire and solid waste, a conceptual school plan, a natural resource protection plan that would serve the site and integrate into the city's, service district or regional plans.

Statewide Planning Goal 11, OAR 660-011-0010 (1), Metro Code 3.07.1120 I, and OCCP p. 118 require the public facility plan including a provision for parks, police, fire, and solid waste disposal; Goal 12, OAR 660-012-0060, Metro Code 3.07.1120 G, and OCCP p. 118 require the transportation plan based upon an inventory of local, regional and state transportation needs and in conformity with the regional plan; Metro Code 3.07.1120 J and OCCP p. 118 require a conceptual school plan; and Metro Code 3.07.1120 H and OCCP p. 118 require the natural resource protection plan. Many of these plans are also required by the City's Findings to Resolution 07-24[64].

The City failed to provide the required plans or reference an existing, updated plan.

Transportation. The concept plan failed to provide the necessary Transportation System Plan (TSP) for the concept plan area and made it clear the City TSP had not been

[64] "The city's findings addressing OCCP 14.4 are set out below: 'The city annexation process is set out in Chapter 14 of the [OCMC]. By requiring compliance with that code, the Metro Code, and the statewide Planning Rules, the city is identifying the effects of the full build-out of these annexed properties will have on public services and any benefit to the city as a whole. As part of the Beavercreek Road Concept Plan adoption, appropriate Master Plans, such as the Transportation System Plan, Water and Sewer Master Plans for example, will be updated to address the anticipated impacts.' Record 63." *Graser-Lindsey v. Oregon City*. 56 Or LUBA 504, p. 19 FN 11.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

updated to include the concept plan area as required by Goal 12, OAR 660-012-0060, Metro Code 3.07.1120 G, and OCCC p. 118. Rec. 57 -- "Update OC Transportation System Plan"; Rec. 20[65] – "future amendments to the Transportation System Plan and Capital Improvement Plan". The City acknowledges that the concept plan is not currently in compliance with the Transportation Planning Rule, OAR 660-012-0060, and does not explain what it means by "limit development until compliance". Rec. 19-20; FN 65. OAR 660-012-0060 provides that "compliance… shall be accomplished" not compliance will be accomplished. A challenged decision must not become final before compliance with relevant rules is assured. *Concerned Citizens v. Jackson Co.*, 33 Or LUBA 70 (1997).

Various transportation studies were done (Rec. Table of Contents Exhibits 69, 87, and 88) and the concept plan mentioned improvements "within the concept plan area" (Rec. 20 – FN 65) such as on-site and near-frontage roads (Rec. 59, 64), their cross-section (Rec. 60-63), and their cost (Rec. 64), but the concept plan leaves a gap in planning without a TSP to address or plan compliance with regulations such as level-of-service performance standards when development of the concept plan area generated transportation impacts to the City's transportation system such as from tens of thousands of projected daily vehicle trips. Rec. 420. Substantial evidence in the record documented this lack of existing capacity in the road system. In bright red typeface, the consultant identifies this stunning gap in the level-of-service and volume/capacity planning between existing conditions and those fundamentally necessary for development of the concept plan, a gap, which is being

---

[65] The City says, ""In order to meet the requirements of this regulation, needed improvements and funding mechanisms have been identified for properties **within** the concept plan area that will mitigate impacts of the amendment in a manner that avoids **further degradation** to the performance of the facilities. The proposed transportation infrastructure improvements, financing and funding estimates, identified in the plan, along with **future** amendments to the Transportation System Plan and Capital Improvement Plan provide adequate basis on which **to limit development until compliance** with the Transportation Planning Rule is shown." p. 19-20.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

considered external to planning: "this analysis assumes that the improvements recommended under the 2027 Mitigated No-Build conditions are in place…". Rec. 1582, Rec. 423 red type, Rec. 413—schematics for 16 interchange/ intersection modifications. The gap is ignored as the consultant continued with on-site transportation planning as if it could magically disappear. Coordination and integration of the concept plan with regional transportation planning is consequently lacking as well. Clearly transportation planning law does not intended solely for on-site planning when Goal 12 says the plan shall "facilitate the flow of goods" and "conform with regional land use plans"; OAR 660-012-0060 applies when "an amendment… would significantly affect an existing… transportation facility"; Metro Code 3.07.1120 has the "transportation plan consistent with the… Regional Transportation Plan…"; and OCCP Policies 14.3.2 concerns impacts to "existing areas" and Goal 14.4 and Policy 14.4.2, "the city as a whole".

Public Facilities and Services. The Goal 11 findings mention a stormwater infrastructure plan, the water infrastructure plan and mention sanitary though not a plan; no police, fire nor solid waste plan is mentioned or referenced. Rec. 19. The Metro findings for "H. Public Facilities and Services" say that parks were included in the conceptual public facility planning (Rec. 25), but the plan is not apparent except the Goal 5 mentions the Open Space Framework plan; however, the plan appears to consist of nothing more than the outline on the map for open space but does not provide park facilities (Rec. 54-55, 625 Konkol) and Goal 8 mentions the City's parks and recreation, open space and trail master plans have not been updated to include the concept plan nor what changes might be made (Rec. 11, 17) and, hence, there is not the required park plan. Goal 11 findings are inexplicable and conclusionary in saying without evidence:

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

"The updated Land Use, Water, Stormwater, Sewer, and Transportation elements address the following public facilities and services: wastewater, water distribution, stormwater management, transportation infrastructure, **police protection, fire protection,** parks and recreation, health services, and other civic facilities." (bold added) Rec. 19.

The Metro "H" findings appear to attempt to make up for the lack of a plan by discussing police and fire services for several sentences but fail to provide any inventory, needs, costs or plan. Rec. 25-26. Solid waste is not addressed.

School. No school plan is prepared nor cited and no consideration nor provision is made for the children from over a thousand planned residences. Rec. 26. *Natural Resource.* The Goal 5 findings mention a Natural Resource Inventory upon which the plan is to be based, but no plan is given. Rec. 15.

In conclusion, the City failed to provide the necessary transportation, public facility and services, school and natural resource protection plans violating Statewide Planning Goals 11 and 12, OAR 660-011-0010 and 660-012-0060, Metro Code 3.07.1120, OCCP p. 118 and the decision must be remanded.

Subassignment of Error 2

The City failed to estimate when each planned public facility project will be needed, what the trigger would be such as population level, service level standards, date and provide detailed strategies for preparing the total land supply. These project timing estimates to carry out the plan and preparation strategies are required by Goal 2, OAR 660-009-0020, OAR 660-011-0010, OCCP Policy 11.1.7, Goal 14.3 and 14.4 and related Policies. The City failed to estimate when the public facilities will be needed or what will trigger development of the public facilities such as population level, service level like reaching a vehicle per day

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

standard or time[66] (OAR 660-011-0025) or strategies for how the land is to be prepared. Due to this error, Ordinance 07-1008 must be remanded.

Subassignment of Error 3

The City failed to provide rough cost estimates for some public facilities and services such as parks, police and fire and part of transportation. These cost estimates are required by OAR 660-011-0010 (1) (c), Metro 3.07.1120 G, H and I, OCCP Policies 11.1.1, 11.1.7, 14.3.4, and 14.4.2. The rough cost estimates were not provided for parks, police and fire. For transportation the on-site/frontage costs were estimated (Rec. 64), but not for off-site impacts. Rec. 1582, 1879-1880. Hence Ordinance 07-1008 must be remanded.

Subassignment of Error 4

The City failed to adequately evaluate the ability of potential funding mechanisms to fund the development, to discuss local fiscal policies and to evaluate likely financing approaches; it failed to coordinate with capital improvement program or discuss how the concept plan would be integrated into it; and it failed to ensure measures will be in place to ensure cost is borne by the developer.

Goal 2, OAR 660-011-0010 (1) (g) and (2), Metro Code 3.07.1120 G, H, and I and OCCP Goal 14.3 and Policies 11.1.1, 11.1.7, 14.3.4, and 14.4.2 require a discussion of the ability and likelihood of funding mechanisms to fund the public facilities and how the concept plan relates to the capital improvement program, and measures to ensure development costs are borne by the developer to the maximum possible extent.

[66] Evidence in the record suggests a band aid approach, rather than a standard-based trigger, is likely to be taken, but this is not demonstrated and is unlikely to comply with level-of-service standards. Rec. 798, 854.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

The City did not adequately evaluate the ability or likelihood of various funding strategies being able to fund the public facilities and infrastructure nor did it discuss its local fiscal policies. Rec. 70-71. The consultant, though not the concept plan, indicates SDCs will be insufficient to pay for on-site infrastructure. Rec. 1123, 70. While the City mentioned that the concept plan area has "improvement-to-land values [that] are likely low enough to" meet the "blight" standard for urban renewal/tax increment financing, it did not evaluate its access to such funding or the extent to which such funds have already been committed to other projects. The City seems to suggest LID funding is unlikely. It did not discuss if bond measures in support of this concept plan are likely to be approved by popular vote. It didn't give any details on other named possibilities. Specifically on transportation the City mentioned there are other sources which "are limited and extremely competitive." Rec. 71. The record does not contain evidence of likely financing approaches (Rec. 862[67], 659, 1516, 854 ¶2) and the City does not identify "likely financing approaches" as required by Metro Code 3.07.1120.

The City indicates that its Capital Improvement Plan (CIP) has not been amended to account for the concept plan as is required by OCCP 14.3 and as can satisfy OAR 660-011-0100 and OAR 660-012-0040, and Metro Code 3.07.1120. Rec. 20. The findings are conclusionary when they assert Goal 14.3 is satisfied without adoption of the CIP. Rec. 11.

The City also did not address compliance of its System Development Charges (SDC) with OCCP 14.4.3, although substantial evidence in the record indicated the SDCs are insufficient for compliance. Rec. 196-K (Neeley, Drentlaw), 1132, 1123, 1175 (Kosinski).

---

[67] The Clackamas County Deputy County Administrator and the Director of the Department of Transportation and Development, together, said, "At this point in time there is a growing regional and statewide recognition that there is just not enough money available for transportation road improvements in Oregon." Rec. 862.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

The necessary public utility systems are not currently available (Rec. 1123) and the City has not demonstrated with which likely funding sources that they can be extended. Planning needs to demonstrate that adequate public utility systems are available or could be extended to service the area. *Highland Condominium Assoc. v. City of Eugene;* 37, Or LUBA 13 (1999).

Because the city failed to evaluate it potential funding mechanisms as likely or able, to discuss its local fiscal policies, to coordinate intergration of the concept plan into the capital improvement program or to evaluate its SDC if violates Goal 2, OAR 660-011-0010 (1) (g) and (2), Metro Code 3.07.1120 G, H, and I and OCCP Goal 14.3 and Policies 11.1.1, 11.1.7, 14.3.4, and 14.4.2 and the decision must be remanded.

Subassignment of Error 5

The City failed to consider, evaluate, plan implementation approaches or otherwise ensure extension of new services does not diminish delivery of those same services to existing areas and residents in the city as a whole despite substantial evidence in the record which indicates that delivery of services to the existing city as a whole will be diminished.

OCCP Policy 14.3.2, Goal 14.4, and Policy 14.4.2 concern how development of the concept plan will affect services to existing areas and costs and benefits to the city.

The City addresses conveying sewage (Rec. 19, 25), but it does not address that area sewage plant capacity problems (Rec. 856, 857) could diminish City services or recreation.

Some of the concept plans assumptions are unreliable and could cause complete traffic failure and diminishment of the ability of the whole City to use its roads e.g. the failure to plan needed off-site road improvements (Rec. 423 red) and the assumption half the

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

residents road trips won't occur[68]. Rec. 420,731. Because the City has not demonstrated that it has the funds to implement the necessary transportation and other public facility improvements, this alone would cause development of the concept plan to diminish public facilities for the existing city; Rec. 429 (left column) illustrates conditions if the concept plan were built without the improvements at Rec. 432 (assuming $125M in improvements were already made). Rec. 1582.

Substantial evidence in the record indicates that, even with all the assumed and planned improvements at a cost of near $200 million (Rec. 412, 432, 1582), the level of service (LOS) will diminish for existing residents at nearly every intersection, because the City had the consultant develop the plan with a target level of service D[69], while existing levels of service are more often above level of service D. Compare 1876 (Existing Traffic LOS) and 431 (Mitigated Build LOS), 447; Appendix G. The study also shows the level of service dipping below the required level of D to E at two intersection. Appendix G.

The City has not compared the costs and benefits to the city as a whole.

There must be adequate plans in place or at least an adequate factual basis to demonstrate that facilities and services can reasonably be provided to the UGB expansion area without leaving the area already included within the UGB with inadequate facilities and services. *Concerned Citizens of the Upper Rogue v. Jackson County*, LUBA 95-173.

[68] The Updated Future Traffic Conditions Analysis assumes 15,140 of 29,685 new trips wouldn't affect area roads. Rec. 420. The state reviewer disbelieved this. Rec. 731 Comments 11 and 12.

[69] "Commissioner Wuest did not catch one thing. What was the level of service you designed the intersection for or plan for? Mr. Brehmer replied what we were trying to do with minimum operating standards level of service D. That was the minimum target we were trying to get to," Rec. 196-F. "Commissioner Mabee said...Kittleson did the study to our level of service, our acceptable level of service... We told them that was the minimum acceptable... Mr. Konkol said the Code spell out level of service acceptable." Rec. 196-G. "Mr. Brehmer... One of the big picture goals... was to the extent possible keep the size of Beavercreek down to a three-lane arterial... We were trying not... to widen Beavercreek... Commissioner Mabee said that would make it an A. Mr. Brehmer said that was one of the overriding goals we were trying to do... meet those minimum operating standards..." Rec. 196-E.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

Because substantial evidence in the record demonstrates that the development of the concept plan will diminish public facilities and services including transportation to the city as a whole and the city has not considered and assessed the costs and benefits to the city in violation of OCCP Policy 14.3.2, Goal 14.4, and Policy 14.4.2, the decision must be reversed.

Subassignment of Error 6

The City failed to show compliance with the Findings of Resolution 07-24 which deferred annexation compliance to the concept plan as decided by *Graser-Lindsey v. Oregon City*, 56 Or LUBA 504 (2008).

LUBA stated concerning this post-annexation planning process:

> "the Beavercreek Road Concept Plan planning process... will establish the nature of that urbanization and how the necessary public facilities will be provided and paid for..." 27:23-25
> "... how those needed public facilities and services will be paid for when the subject property does urbanize. Those determinations will be made in the Beavercreek Road Concept Plan planning process. 29:19-30:2
> "The underlying purpose of OCCP Goal 14.4 and related.., provisions appears to be to ensure,.. concept plans will provide... adequate and sufficient public facilities are extended to annexed areas as they urbanize in a way that does not financially burden or adversely affect public facilities and services in other parts of the city." 20:4-9.

As previously discussed above, the City did not show how the necessary public facilities will be provided and paid for in a way that does not financially burden or adversely affect public facilities and services in other parts of the city as required by its Findings to Resolution 07-24. Consequently, the City's decision must be remanded.

Subassignment of Error 7

The City failed to comply with Statewide Planning Goals 5 and 7.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

Goal 5 and OCCP 5.4.5, 5.4.7, and 5.4.16 require protection of streams and wetlands and Goal 7 deals with natural hazards and landslides.

Metro's Goal 5 Map shows a green-colored stream across the site. (North of Loder Rd., this stream is the canyon labeled E3). Rec. 1512, 724. The concept plan says, "The location and linearity of the park was first indicated by Metro's Goal 5 mapping." Rec. 54-55. However, the park and creek are not co-located[70] and no such implementation measure is planned. To the contrary, developers got the park shrunk (Rec. 1077-1078, 293, 295, 314 Konkol) and the findings state "the code will allow flexibility…". Rec. 16. The plan does not comply with Goal 5 and the Findings do not address this disconnect.

The concept plan violated Goal 7 concerning reducing the risk to people and property from landslides, when at the developers' request (Rec. 721 "490", 1077) but without geological landslide data (e.g. Rec. 687 Thayer N), it changed the plan (Rec. 1328-1330, where 490 feet was mis-written as "190") to permit development on the steep slope of Thimble Creek canyon below 490-foot elevation. Rec. 16, 56, 724 E5. The plan does not comply with Goal 7.

Because of its Goal 5 and 7 violations, the decision must be reversed or remanded.

Subassignment of Error 8

The City failed to provide the basis for specific implementation measures in that the concept plan give little indication what implementation measures there might be. Goal 2 requires the concept plan serve as a basis for implementation measures. The city relies on

[70] E.g. "Central Park was not based on what was quoted… Metro's Goal 5 mapping…" Rec. 1077 and personal communication between Petitioner and Joe Dills of Otak in 2007 around Rec. 683.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

about half the new traffic using area roads (Rec. 420; 731 Comments 11 and 12; FN 68) and implementation measures would be necessary to assure this happens. There is no park implementation measure to comply with Goal 5. The Findings are conclusionary when stating there are "adequate implementation measures" when the text is vague about any and it acknowledges none have been adopted. Rec. 15; FN 2. Consequently, the concept plan does not comply with Goal 2 and the decision must be remanded.

Subassignment of Error 9

The City is not able to properly plan public facilities and services for the concept plan area, because complying uses remain unknown. Goals 2, 11, 12, Metro Code 3.07.1120 and related law require public facilities and services be planned. Because the City is out of compliance with Metro 3.07 Title 4 and related law and the concept plan subdistricts need to be reconceived, the resulting, complying uses are currently unknown. The uses of land must be known for the City to be able to properly plan public facilities and services as the law requires. *1000 Friends of Oregon v. North Plain,* LUBA 93-154, p. 23 and *Graser-Lindsey v. Oregon City*, 56 Or LUBA 504[71]. Consequently, the decision must be reversed.

THIRD ASSIGNMENT OF ERROR

Oregon City Erred In Adopting Oregon City Ordinance 07-1008 When (1) The Concept Plan Is Out Of Compliance With OCCP P. 16 #3 And The Findings Are Insufficient And Not Supported By Substantial Evidence In The Record; (2) The Process Violated The Substantial Rights Of The Petitioner, And (3) The Citizen Involvement Process For Adopting The Concept Plan Did Not Comply With The Acknowledged Citizen Involvement Program Or Statewide Planning Goal 1; The Findings Were Insufficient To Support The Decision And Not Supported By An Adequate Factual Basis, And Substantial Evidence In The Whole Record Shows The Citizen Involvement As Out Of Compliance.

[71] "Until the city knows how the annexed area will urbanize, *i.e.* until the Beavercreek Road Concept Plan is completed, it is not possible [to] consider 'the effects on public services and the benefits to the city as a whole' in any meaningful way. That is why the city has effectively deferred that consideration to the Beavercreek Road Concept Plan process." *Graser-Lindsey v. Oregon City.* ____18:8-19, 23:11-15.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

Statewide Planning Goal 1 requires governmental units:

"To develop a citizen involvement program that **insures** the opportunity for citizens to be involved in **all phases** of the planning process. The governing body charged with preparing and adopting a comprehensive plan **shall** adopt and publicize a program for citizen involvement **that clearly defines the procedures by which the general public will be involved** in the on-going land-use planning process. The citizen involvement program **shall be appropriate to the scale** of the planning effort. The program **shall provide for continuity** of citizen participation and of information that enables citizens to identify and comprehend the issues… The citizen involvement program shall incorporate the following components:
"1. Citizen Involvement -- To provide for **widespread citizen involvement**. The citizen involvement program **shall involve a cross-section of affected citizens in all phases of the planning process**…"
"3. Citizen Influence -- **To provide the opportunity for citizens to be involved in all phases of the planning process.** Citizens shall have the opportunity to be involved in the phases of the planning process … including Preparation of Plans and Implementation Measures, Plan Content, Plan Adoption, Minor Changes and Major Revisions in the Plan, and Implementation Measures."
"6. Financial Support – **To insure funding** for the citizen involvement program."
"A. CITIZEN INVOLVEMENT 1. **A program for stimulating citizen involvement** should be developed using a range of available media…"

Oregon City Comprehensive Plan states:

Section 1 "This section is intended to show compliance with…LCDC… Statewide Planning Goal 1, Citizen Involvement…" OCCP p. 5.

Goal 1.1 "Implement a Citizen Involvement Program that **will provide an active and systematic process for citizen participation in all phases of the land-use decision-making process to enable citizens to consider and act upon a broad range of issues affecting the livability, community sustainability, and quality of neighborhoods and the community as a whole.**"

Goal 1.2 "**Ensure that citizens,** neighborhood groups, and affected property owners are involved in **all phases** of the comprehensive planning program."

Goal 1.3 "Provide education for individuals, groups, and communities to ensure effective participation in decision-making processes that affect the livability of neighborhoods."

Goal 1.4 "Provide complete information for individuals, groups, and communities to participate in public policy planning and implementation of policies."

Policy 1.4.1 "**Notify citizens about community involvement opportunities when they occur.**"

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

Goal 1.8 "Establish and support citizen advisory committees and commissions."

Policy 1.8.1 "Identify the areas of City government in which the counsel of a formal citizen advisory committee or commission is warranted..."

Policy 1.8.2 "Solicit and support citizen participation on citizen advisory committees and commissions."

In addition the OCCP gives a related criterion[72] for evaluating the comprehensive plan:

"Whether the Plan still reflects community needs, desires, attitudes and conditions. This shall include changing demographic patterns and economics." OCCP p. 16.

Subassignment of Error 1

The concept plan does not comply with OCCP p. 16#3 and findings to the contrary are conclusionary and disregard substantial evidence in the record.

OCCP p. 16 #3 identifies community desires and attitudes about the plan as relevant to amending the comprehensive plan.

Concerning OCCP p. 16 criterion #3, the findings claim: "Citizen input was critical to ensure that the community's desires and attitudes would be reflected in the Concept Plan... The concept plan is a reflection of the needs, desires, attitudes and conditions of the community..." Rec. 12-13. As discussed in AOE 3 B below, the City failed to consider the bulk[73] of the citizen input which occurred in early stages of the concept-plan process during the citizen involvement activities the Findings list[74]. Rec. 12-13. The findings are conclusionary when they claim the concept plan complies with OCCP p. 16 #3, when they present no evidence of "the community's desires and attitudes" to support this claim, evidence of "the community's desires and attitudes" has largely been omitted from the record, and the substantial evidence in the Record indicates "the community's desires and

[72] The Findings mention this criterion. Rec. 10, 12-13.
[73] More citizens participated in the early process (Rec. 93-101), while only a very few attended and/or testified at the city commission hearings.
[74] "Twelve meetings... two open houses... a design workshop..." Rec. 12-13.

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

attitudes" ran in opposition to the concept plan. Rec. 1496, 786 & 1587-1593 (second open house), 758, 709, 710, 850-851, 895-896, 1099; Second Rec. Supp. 179-180. Local governments are to explain the rule, the consideration of it and the weighing in the findings. *Tollefson v. Jackson County.* 51 Or LUBA 790 (2006); *Kautson Family, LLC v. City of Eugene.* 48 Or LUBA 399 (2005); *Lathop v. Wallowa County.* 25 Or LUBA 693 (1993).

The decision violates OCCP p. 16 #3 for the reasons stated and the findings are inadequate to support the decision and it must be reversed or remanded.

Subassignment of Error 2

The process violated the substantial rights of the petitioner.

OAR 661-010-0071 provides for decisions to be remanded when they prejudice the substantial rights of the petitioner.

The substantial rights of the petitioner were violated when she did not get notice of the final resumed hearings on the Beavercreek Road concept plan and consequently could not attend the hearings due to the road sign not being updated and being removed around the time of the first city commission hearing (Appendix D -- the picture dated "11/14/07" shows the "Sept. 24, 2007" planning commission hearing being advertised rather than the 10/22/07 meeting), Rec. 863, Rec. Table of Contents Exhibits 38-40., due to not receiving mailings and due to the continuity of the process being lost by the long delay between Jan. and Sept. (e.g. 1st S Rec. 11 and 14 -- "Staff requests… continues…"). Goal 1 requires "the program shall provide for continuity of citizen participation" and OCCP requires "notify citizens".

Petitioner's substantial rights were violated when the adopted decision is not clear in the Record and she cannot find the concept plan "Technical Appendix (Under Separate Cover)" (Rec. 33) or the "Ancillary Documents" adopted by the Ordinance (Rec. 5) in the

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

Record nor the many references throughout the plan e.g. C6 and H3 at Rec. 68 or C3, D, and E at Rec. 73; as a result of not finding the relevant documents, she left certain arguments out of her brief. During Record Objections, when she asked where C2 and G were in the record (Precautionary Record Objections, page 6:4-5), she was given 2 options for C2 (Response to Petitioner's Record Objections, page 4:19-20), she does not have a concrete idea what has been adopted. The comprehensive plan including its ancillary documents is the fundamental document that governs land use planning. Citizens must be able to rely of the fact that the acknowledged comprehensive plan and information integrated I that plan will serve as the basis for land use decisions, rather than running the risk of being "sandbagged" by government's reliance on new date that is inconsistent with the information on which the comprehensive plan was based. *1000 Friends of Oregon v. City of Dundee*. 203 Ore. App. 207 (2005).

The Petitioner's substantial rights were violated when the City accepted new evidence and testimony (e.g. in Aug. 2008, Rec. 293-294, 447-453) after the public testimony part of the hearing was closed April 16, 2008 (Rec. 555) and the record was closed June 4, 2008 (Appendix H; Rec. Items Retained C April 16, 2008 Tape 2 Side 1 Count 637) and the Commission Reports prepared by the staff indicated the process had moved to the First Reading on June 4, 2008 (Rec. 533), so she was not able to provide testimony about these new items.

Because the City committed procedural errors which prejudiced the substantial rights of the petitioner, the decision must be remanded.

[Subassignment of Error 3 C will be argued on page 51 if LUBA allows this Petition for Review to go over length.]

V. CONCLUSION

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

In this decision, Oregon City disregarded laws at all levels including on proper planning of industrial lands, providing for public facilities and services and following an acknowledged citizen involvement plan, so the decision to adopt Ordinance 07-1008 and the Beavercreek Road Concept Plan should be reversed.

DATED this 15th day of May, 2009.

By: Elizabeth Graser-Lindsey
Elizabeth A. Graser-Lindsey

Elizabeth Graser-Lindsey
21341 S. Ferguson Rd.
Beavercreek, OR 97004
(503) 632-5568

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

LAND USE APPLICATION TRANSMITTAL

July 24, 2014

CITY STAFF DISTRIBUTION	***MAIL-OUT DISTRIBUTION***
❑ BUILDING OFFICIAL ✓	❑ NEIGHBORHOOD ASSOCIATION _Caufield ✓
❑ DEVELOPMENT SERVICES MANAGER ✓	❑ NATURAL RESOURCES COMM. (NRC)
❑ PUBLIC WORKS- OPERATIONS ✓	❑ CLACKAMAS COUNTY TRANSP. & PLANNING ✓
❑ CITY ENGINEER ✓	❑ CLACKAMAS FIRE DISTRICT #1 ✓
❑ PUBLIC WORKS DIRECTOR ✓	❑ ODOT – Division Review ✓
❑ TECHNICAL SERVICES (GIS) ✓	❑ OREGON CITY SCHOOL DISTRICT ✓
❑ PARKS MANAGER ✓	❑ TRI-MET ✓
❑ ADDRESSING	❑ METRO ✓
❑ POLICE ✓	❑ OREGON CITY POSTMASTER
TRAFFIC ENGINEER	❑ DLCD
❑ REPLINGER AND ASSOCIATES ✓	❑ CITY ATTORNEY ✓
	❑ OTHER: _____
Mailed Notice to County CPO's	
❑ Central Pt-New Era-Leland / Holcomb-Outlook/Beavercreek ✓	
Mailed Notice	
❑ Within 300' ✓	

PUBLIC COMMENTS DUE:	6:00 p.m., August 11, 2014
REVIEW COMMENTS DUE:	6:00 PM, August 25, 2014
HEARING DATE:	Type II – Not applicable
HEARING BODY:	**XX Staff Review;** _____PC; _____CC
FILE # & TYPE:	SP 14-01: Site Plan and Design Review for a 121-unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1) – East side of Beavercreek Road
PLANNER:	Pete Walter, AICP, Planner (503) 496-1568
PROJECT WEBSITE:	http://www.orcity.org/planning/landusecase/sp-14-01-beavercreek-road-apartments-live-work-units
APPLICANT:	Beavercreek Road, LLC, Attn: Andrew Brand
LOCATION:	19896 Beavercreek Rd, Oregon City OR 97045 (See Vicinity Map on Public Notice) Clackamas County Map 3-2E-10C Tax Lot 800

This application material is referred to you for your information, study and official comments. If hard copies are required, please contact the Planning Department. Your recommendations and suggestions will be used to guide the Planning staff when reviewing this proposal. If you wish to have your comments considered and incorporated into the staff report, please return the attached copy of this form to facilitate the processing of this application and ensure prompt consideration of your recommendations.

Please check the appropriate spaces below. Attach additional pages if needed.

_____ The proposal does not conflict with our interests.

__X__ The proposal conflicts with our interests for the reasons stated below.

_____ The proposal would not conflict our interests if the changes noted below are included.

See ATTACHED

Signed _____ 08-06-14

Title Concerned Citizen

PLEASE RETURN YOUR COPY OF THE APPLICATION AND MATERIAL WITH THIS FORM.

Stephen Gufreda
15550 S Old Acres Lane
Oregon City, Oregon 97045

Oregon City Community Development
SP 14-01
Pete Walker AICP Planner
221 Molalla Ave #200
Oregon City, Oregon 97045

Dear Sirs,

I appose the proposed development at 19896 Beavercreek Rd. , Oregon City. Oregon 97045. This development will put undo burden on the existing infrastructure.

For example:

The traffic is already at high level on the single lane road of Beavercreek Rd. with the high school and the collage traffic not to mention the thousands of homes further out the Beavercreek Rd area. The vehicles turning into and out of this development could likely create a situation of gridlock on the surrounding surface streets.

The sewage generated by an additional 112 units of apartments and 62 live work units may overload this system.

This development will increase the pedestrian traffic and it is already very unpleasant to walk Beavercreek Rd.

Will the police department be able to adequately patrol this area of mass housing and the activity which usually attaches itself to these high density developments.

In conclusion, this proposal is not needed nor is compatible with the the rural nature of the community. Also, we are loosing the open space that all the folks living out here enjoy.

Thank you,

Stephen Gufreda
stephen@bctonline.com
503.621.6064

Hamlet of Beavercreek

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

LAND USE APPLICATION TRANSMITTAL

July 24, 2014

CITY STAFF DISTRIBUTION	***MAIL-OUT DISTRIBUTION***
❑ BUILDING OFFICIAL ✓	❑ NEIGHBORHOOD ASSOCIATION _Caufield ✓
❑ DEVELOPMENT SERVICES MANAGER ✓	❑ NATURAL RESOURCES COMM. (NRC)
❑ PUBLIC WORKS- OPERATIONS ✓	❑ CLACKAMAS COUNTY TRANSP. & PLANNING ✓
❑ CITY ENGINEER ✓	❑ CLACKAMAS FIRE DISTRICT #1 ✓
❑ PUBLIC WORKS DIRECTOR ✓	❑ ODOT – Division Review ✓
❑ TECHNICAL SERVICES (GIS) ✓	❑ OREGON CITY SCHOOL DISTRICT ✓
❑ PARKS MANAGER ✓	❑ TRI-MET ✓
❑ ADDRESSING	❑ METRO ✓
❑ POLICE ✓	❑ OREGON CITY POSTMASTER
TRAFFIC ENGINEER	❑ DLCD
❑ REPLINGER AND ASSOCIATES ✓	❑ CITY ATTORNEY ✓
	❑ OTHER: _____
Mailed Notice to County CPO's	
❑ Central Pt-New Era-Leland / Holcomb-Outlook/Beavercreek ✓	
Mailed Notice	
❑ Within 300' ✓	

RECEIVED
2014 AUG 11 PM 1:49
CLACKAMAS COUNTY

PUBLIC COMMENTS DUE:	6:00 p.m., August 11, 2014
REVIEW COMMENTS DUE:	6:00 PM, August 25, 2014
HEARING DATE:	Type II – Not applicable
HEARING BODY:	_XX_ **Staff Review;** _____PC; _____CC
FILE # & TYPE:	SP 14-01: Site Plan and Design Review for a 121-unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1) – East side of Beavercreek Road
PLANNER:	Pete Walter, AICP, Planner (503) 496-1568
PROJECT WEBSITE:	http://www.orcity.org/planning/landusecase/sp-14-01-beavercreek-road-apartments-live-work-units
APPLICANT:	Beavercreek Road, LLC, Attn: Andrew Brand
LOCATION:	19896 Beavercreek Rd, Oregon City OR 97045 (See Vicinity Map on Public Notice) Clackamas County Map 3-2E-10C Tax Lot 800

This application material is referred to you for your information, study and official comments. If hard copies are required, please contact the Planning Department. Your recommendations and suggestions will be used to guide the Planning staff when reviewing this proposal. If you wish to have your comments considered and incorporated into the staff report, please return the attached copy of this form to facilitate the processing of this application and ensure prompt consideration of your recommendations.

Please check the appropriate spaces below. Attach additional pages if needed.

_____ The proposal does not conflict with our interests.

_____ The proposal conflicts with our interests for the reasons stated below.

_____ The proposal would not conflict our interests if the changes noted below are included.

_____

_____

_____

Signed_____

Title_____

PLEASE RETURN YOUR COPY OF THE APPLICATION AND MATERIAL WITH THIS FORM.

The Hamlet of
BEAVERCREEK
PO BOX 587 · BEAVERCREEK · OREGON · 97004

Mr. Pete Walter, Planner
City of Oregon City Community Development
221 Molalla Avenue, Suite 200
Oregon City, OR 97045

August 11, 2014

RE: SP 14-01: Site Plan and Design Review for a 121-unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1)
East side of Beavercreek Road

This is a Land Use Application Transmittal from The Hamlet of Beavercreek regarding the subject proposed Site Plan and Design Review. After meeting to study the application, SP 14-01, The Hamlet of Beavercreek cannot support this Land Use application for the following reasons:

1) First and foremost, the 6,500 citizens of The Hamlet of Beavercreek (HOB) were not notified by the City of Oregon City of the subject Land Use application, SP 14-01.

On October 6th, October 13th and October 20th, 2010, the Hamlet of Beavercreek both testified and presented their letters to the City of Oregon City over this same Land Use, which was then application ZC 10-01 and PZ 10-01.

Testimony in 2010 spoke of the lack of Land Use notification to the HOB, and how the Planning Commission already had, on August 30th, 2010, met and approved the land use application ZC 10-01 and PZ 10-01. Mayor Norris did grant the HOB an additional seven day time period in which to respond their concerns to the City. The HOB did timely respond on October 13th, 2010, which was followed by a request from the HOB that "we hope in the future that Oregon City will notify the Hamlet in a more timely fashion, giving them the necessary time to study the land use file and reply."

The HOB does note, that on the Land Use Application Transmittal of July 24th, 2014, the City has checked off that the Central Pt-New Era-Leland/Holcomb-Outlook/Beavercreek CPO's and Hamlet were notified. We do not know who may have received this notice, but the HOB did not, and we are asking once again that ALL Land Use applications be sent to the Hamlet.

2) We noted that on July 29th, 2013, an Invitation was sent to the Caufield Neighborhood Association, by Evergreen Housing, to meet on August 15th, 2013 at McLoughlin Hall at Clackamas Community College. The meeting was arranged to help the Neighborhood Association learn about a new 239 unit market rate multi-family development proposed at 19896 S Beavercreek Rd in Oregon City. We are extremely concerned that the "6,500 people living in Beavercreek" were completely ignored and not invited to this same meeting. The lives of these 6,500 people are dramatically impacted by all development that is proposed for Beavercreek Road.

3) The HOB objects to any parking on an Arterial, presenting too much danger for both motorists and citizens, and is not appropriate when there is a large High School just across the street.

4) When speed limits in the Beavercreek/Meyers area are slow, traffic and commutes are slowed. The ability for Ambulance, Fire and Police to reach areas of Beavercreek will be highly compromised.

5) We believe the Traffic Counts per day are incorrect as only Residential units were considered. When adding in the Live-Work commercial units, these counts will become much higher. The Traffic Counts need to be corrected to reflect ALL incoming and outgoing trips.

6) Beavercreek Rd is currently three lanes at this location. When considering the addition of sidewalks, bike lanes, parallel parking pockets, and street trees, these additions will dramatically narrow this important arterial which is already close to failing. Even the citizens from the Caufield Neighborhood Association stated that traffic is becoming "tight" here.

7) Only 1.82 stalls per unit is not enough. For the Live-Work units, where will all the clients park? For the residential units, many young people attending the High School and College will share only one apartment and 1.82 units will not be sufficient.

8) Both I-205 and Hwy 213 are expected to fail before the next twenty years per the model used and there are NO state dollars to expand.

9) On August 17th, 2010, a letter was sent from ODOT to Pete Walter, City Planner, stating that ODOT recognizes that the westbound right turn lane is also needed to mitigate for the traffic impacts associated with the Beavercreek Concept Plan. Therefore, it is recommended that the applicant be conditioned to contribute their proportionate share of the right turn lane based on their traffic impact. Additional analysis may be needed to determine proportionate share in relationship to the broader Beavercreek

Concept Plan area. ODOT supports the findings and recommended mitigation identified in the TIA with the following provisions to ensure no significant effect on OR 213.

a) The City of Oregon City documents through the land use decision that the Meyers Road extension improvement is "reasonably likely" to be provided by the planning horizon (year 2027)

b) The land use decision includes a condition requiring the applicant to contribute funding to City of Oregon City for the construction of the westbound right turn lane at the OR 213/Meyers Rd Intersection.

The HOB requests the City to answer the above ODOT concerns and state whether identified provisions will be completed, when, by whom and how financed.

10) The HOB requests additional information about the "skew" at Beavercreek & Meyers.

Lastly, the HOB sent three letters to the City in 2010 (attached), with concerns which have gone unanswered and we ask that the City respond to the HOB regarding the following:

In our letter of October 13th, 2010, first paragraph of Pg.3, "Testimony was given at both the September 15th and October 6th, 2010 hearings regarding financial concerns on the part of the applicant. The applicant explained that he is seeking a Zone change for this property which will allow him to obtain the necessary financing for this parcel and that apparently without a Zone change the **lender may consider foreclosure.** City Attorney, Ed Sullivan, quickly brought to the attention of the Commission that they cannot consider the financial concerns of the applicant as part of their decision to approve, or disapprove, these land use applications."

The above testimony seriously questions the applicant's ability of contributing funding to the City of Oregon City for the construction of the westbound right turn lane at the OR 213/Meyers Rd intersection. We ask the City to publicly divulge the total amount of funding required from the applicant, when are monies due to the City and what measures are in place to ensure that the applicant has the ability to pay the total amount of his share of the funding.

In our letter of October 20th, 2010, two serious conditions were brought forward that the City continues to ignore. Page 2, paragraph 4, "Also, under transportation in the city's staff memorandum, city staff states the TIA was prepared in consultation with and reviewed by ODOT and city staff and found to comply with all applicable transportation standards." "We point out, once again, that the HOB was not invited to be a part of

these meetings and therefore their concerns were never heard."

Page 3, last paragraph, "Additionally, we understand from County staff that Mr. Konkol has informally agreed to send all future land use application notices to both the HOB, the Holcomb-Outlook CPO and the Central Point-Leland-New Era CPO, which are the three CPO's bordering the City of Oregon City. The HOB requests the City Commission to act upon this agreement tonight by formally writing this agreement into City Code, and after approved, we ask that all land use notices be sent by both U.S. Mail as well as e-mail, as a precaution in the event that mail is not timely delivered."

We ask once again that Oregon City comply with the above agreement and take steps to ensure that the HOB is informed by both mail and e-mail of all future land use applications.

Representing the Board of The Hamlet of Beavercreek

Christine Kosinski
Corresponding Secretary and Co-Speaker
The Hamlet of Beavercreek
Cor.Sec@Beavercreek.org

encl: October 6th, 2010 letter from The Hamlet of Beavercreek to Oregon City
October 13th, 2010 letter from The Hamlet of Beavercreek to Oregon City
October 20th, 2010 letter from The Hamlet of Beavercreek to Oregon City

The Hamlet of
BEAVERCREEK
PO BOX 587 · BEAVERCREEK · OREGON · 97004

October 6, 2010

Alice Norris, Mayor
Jim Nicita, Commissioner
Daphne Wuest, Commissioner
Doug Neeley, Commissioner
Rocky Smith, Commissioner
David Frasher, City Manager
City of Oregon City

RE: Land Use Application ZC 10-01 and PZ 10-01
19896 Beavercreek Road - Meyers and Beavercreek Road Intersection
9.59 Acre Parcel brought into the UGB in 1979, annexed to the city in 2008
Contiguous to the Beavercreek Road Concept Plan

Honorable Mayor Norris and City Commission:

The Hamlet of Beavercreek enters this letter into the City of Oregon City records and requests the Oregon City Commission remand the above Land Use applications back to the Oregon City Planning Commission for the purpose of re-opening the hearings to public testimony. Our request is based on the following information.

The Hamlet is enclosing a copy of a notice generated by Oregon City Community Development-Planning. The notice is marked mailed July 16th, 2010 and describes a hearing on ZC 10-01 and PZ 10-01 to be held Monday, August 30th, 2010. The notice was mailed from the Oregon City Planning Division to the Hamlet of Beavercreek, Postmarked September 3rd, 2010, (copy enclosed). This notice was received by the Hamlet of Beavercreek **AFTER THE PLANNING COMMISSION ALREADY MET ON AUGUST 30TH AND APPROVED THE LAND USE APPLICATION** for forwarding to the City Commission at it's next meeting on September 15th, 2010.

We draw your attention to the Oregon City "Notice of Public Hearing" which states the Notice was mailed, July 16, 2010. In fine print, your Notice states " The application and all documents submitted by or on behalf of the applicant are available for inspection at no cost at the Oregon City Planning Division on Molalla Avenue in Oregon City. The staff report, with all the applicable approval criteria, will also be available for inspection seven days prior to the hearing. Any interested party may testify at the public hearing and/or submit written testimony at or prior to the close of the City Commission hearing.

Written comments must be received by close of business at City Hall 10 days before the scheduled hearing to be included in the staff report. Written comments received within 10 days of the hearing will be provided to the Commission at the hearing."

The Hamlet of Beavercreek and its citizens were deprived of inspecting these applications and documents. They were deprived of having the ability to testify at the public hearing and/or submitting written testimony prior to the close of the City Commission hearing within your time frame. They were deprived because they **did not receive notice of these Hearings!**

Both city records and the Agenda from the City Commission meeting of September 15th, 2010 clearly show that the above Land Use applications were brought before the City Commission to seek approval for a Zone change from the current zoning of FU10 to MUC-1 for this 9.59 acre parcel which is located at 19896 Beavercreek Road and is contiguous to the Beavercreek Road Concept Plan.

When Mayor Norris opened the meeting, on September 15th, 2010, to "citizen comments", Christine Kosinski, a member of the Hamlet of Beavercreek made comments to the Commission and inquired why the Hamlet of Beavercreek was not notified of the hearings in front of the Planning Commission on August 30th, 2010? Mrs. Kosinski further commented that there are about 6500 citizens in Beavercreek who rely daily on Beavercreek Road since this is virtually the only way "in and out" of Beavercreek. She further commented that this 9.59 acre parcel **is contiguous to the Beavercreek Rd Concept Plan**, and therefore the Hamlet should have been notified of these hearings since the same requirements that applied to the Concept Plan should apply to this 9.59 acre parcel. She questioned why Oregon City did not recognize this fact and that she felt the city had ignored 6500 citizens from having their voices and concerns heard in violation of state land use Goal One.

Tony Konkol, city planner, stated the city had met the legal requirements of notifying those within 300 feet of the Land Use application. Then Mr. Konkol stated to the Commission, actually we did send notice to the Hamlet, however this was done as an "afterthought".

Commissioner Neeley spoke, asking the Commission to recognize the people of the Hamlet of Beavercreek. Commissioner Neeley stated the Commission should not vote on the Land Use application until their next meeting, allowing the people of Beavercreek to be heard. The Commission approved, but stated that the Hamlet may only bring forth testimony which was brought before the Planning Commission.

The Minutes of the Planning Commission meeting of August 30th, 2010 state that Chair Powell opened the meeting to public testimony, there being none, Chair Powell closed the meeting to public comments and subsequently the Planning Commission approved Land Use Applications PZ 10-01 and ZC 10-01 which were referred on to the City Commission for their next meeting on September 15th, 2010.

This was a travesty to the people of Beavercreek. Did the City of Oregon City purposefully ignore the Hamlet? Certainly because the Hamlet was not timely notified, they now are virtually locked out from giving public testimony since they are confined to testify only to comments brought before the Planning Commission, for which there were none.

By not allowing the 6500 people of the Hamlet of Beavercreek to publicly testify, whose primary access in and out of Beavercreek, is on Beavercreek Road, the City of Oregon City has committed a thoughtless and contemptuous act upon the Hamlet of Beavercreek and has breached the requirements of Goal One.

This land use application is for property that is contiguous to the Beavercreek Road Concept Plan, therefore the same requirements should apply and that would be to timely notify the Hamlet of Beavercreek of these hearings.

Furthermore, The Hamlet goes on record stating that it requests the City of Oregon City send notice of all Land Use applications which effect it's boundaries on both Beavercreek Road and Highway 213. As development occurs in the future along both of these two major corridors, traffic from the rural areas will become increasingly affected since these are the only two major corridors bringing rural residents into the city allowing connection to Oregon's major transportation corridor. The safety of these citizens could also become compromised since heavy traffic will slow down the response times for Fire, Police and Ambulance.

With the above information, we ask that you honor our request to remand Land Use applications ZC 10-01 and PZ 10-01 back to the City Planning Commission, appropriately allowing the voices of the citizens of the Hamlet of Beavercreek to be heard.

Representing the Board of The Hamlet of Beavercreek

Christine Kosinski
Corresponding Secretary and Co-Speaker
The Hamlet of Beavercreek

Encl: Oregon City Notice of Public Hearing
Copy of Postmark on envelope – to the Hamlet – dated Sept 03, 2010

cc: Clackamas County Board of Commissioners
cc: Steve Wheeler, Clackamas County
cc: Cam Gilmour, Clackamas County
cc: Gail Curtis, ODOT
cc: Hamlet of Mulino
cc: Hamlet of Molalla Prairie
cc: Ray Valone, Metro
cc: Michael Jordan, Metro
cc: Carlotta Collette, Metro

The Hamlet of
BEAVERCREEK
PO BOX 587 · BEAVERCREEK · OREGON · 97004

October 13, 2010

Alice Norris, Mayor
Jim Nicita, Commissioner
Daphne Wuest, Commissioner
Doug Neeley, Commissioner
Rocky Smith, Commissioner
David Frasher, City Manager
City of Oregon City

RE: Land Use Application ZC 10-01 and PZ 10-01
19896 Beavercreek Road – Meyers and Beavercreek Road Intersection
9.59 Acre Parcel brought into the UGB in 1979, annexed to the city in 2008
Contiguous to the Beavercreek Road Concept Plan

Honorable Mayor and City Commission:

The Hamlet of Beavercreek enters this letter into the City of Oregon City records in reference to land use applications ZC 10-01 and PZ 10-01. Comments from the Hamlet, based on the Staff Report for the above land use applications, are addressed in this letter and consist of concerns for:

- ***Title 11 requirements***
- ***Reduced density***
- ***Piecemeal development***
- ***Financial obligations of the applicant***
- ***Transportation issues***
- ***Concerns for Compliance with policy***
- ***Partnering with your neighboring Hamlets and County CPO's***

Title 11 first requires that local governments place interim measures on the new urban land to protect it from urbanization before a plan is completed and adopted. When new land is brought into the urban growth boundary, Metro collaborates with local cities and counties to plan how the new communities will be developed and served by roads, schools and other urban services.

In December 2002, the Metro Council voted to expand the urban growth boundary by 18,638 acres. In 2004 and 2005, the Metro Council voted to expand the urban growth boundary by an additional 2,500 acres for industrial land purposes. Before this land is converted from rural to urban use, Metro requires that it be planned by the local city or county that will provide services for the new urban area.

This 9.59 acre parcel was previously part of the Beavercreek Road Concept Plan and subject to Title 11 requirements. Oregon City now proposes to develop this parcel separately and states Title 11 will not apply since this property was brought into the UGB in 1979 (prior to Title 11 requirements), and furthermore, is no longer subject to Title 11 requirements since the Concept plan has not been approved.

We question Title 11 status for this property. Please clarify if this parcel was under Title 11 when part of the Beavercreek Road Concept Plan. And if so, then explain why the City now states that it is not? Also, because this parcel was not annexed into the City until 2008, when Metro required compliance with Title 11, wouldn't this property now be subject to the requirements of Title 11?

The proposed density for this 9.59 acre parcel was much higher when part of the Beavercreek Road Concept Plan under MEV zoning, however now the density is being reduced. The city must transfer this density and where will that be? Understand that as the city transfers density further out, the rural lands of the Hamlet of Beavercreek and other surrounding County CPO's will be pressured by urbanization coming directly up against their boundaries.

Testimony was brought forward by a member of the Hamlet of Beavercreek, stating that taking this 9.59 acre parcel out of the Concept Plan would allow for "piecemeal development". The Beavercreek Road Concept Plan, as well as Title 4 land, has not been planned or approved, therefore we do not know what the plan will look like. If development begins on this 9.59 acre parcel prior to the Concept Plan being planned and approved, then how will the city and developer understand the proper development of this parcel so that it actually blends in with the Concept Plan and appears as though it is part of this entire community? If planning is not correctly executed for this 9.59 acre parcel it just could become a project which the city will regret. We do not believe this is what you want, but rather we feel you want to develop a concept plan for which you can take much pride.

These slower speeds will queue traffic dramatically and create a traffic mess in this vicinity. We bring your attention also to the Traffic Report addressing the intersection of Molalla Avenue and Highway 213. The report shows (357) trips onto Molalla without the Meyers Road extension and a count of 325 trips with the extension, please explain why it would be down 22 trips? Additionally, why would you propose to put even more traffic onto the Intersection of Highway 213 and Molalla Avenue when this will create a heavier back up in traffic? Currently, traffic at the Peak Hour on Highway 213 and Molalla backs up to the Haggen's Market and beyond.

Again, the proposal to extend Meyers Road does not make any sense. This is a small two-way street with stop signs only and no signal until Warner Milne Road. The only way that an extension of Meyers Road will be helpful is if the City dramatically improves Meyers Road and puts it through to Leland Rd, preventing traffic from being dumped onto Highway 213. In it's current state, Meyers Road is not beneficial in any way to moving anything other than lesser amounts of traffic east and west between Beavercreek Rd and Glen Oak Rd.

Finally, let us not lose sight of the real elephant in the room, and that is for the intersection of Beavercreek Road and Highway 213. This is where our attentions should be focused, now and in the future, since this is the true pinch point for vehicular traffic in this entire region. Continued stresses, from all future development by the City, will have great effects upon this intersection, which even with continual expansion, fails miserably.

We fail to see how this proposed development will benefit Oregon City. We do not understand why you are deviating from the Concept Plan for one property owner? And now you are decreasing density, from the previous MEV zoning in the Concept Plan, where this property was to be the "cornerstone" of the plan? We question where will the density be transferred to within the Concept Plan? Lastly, why are you creating absolutely huge expenses for a transportation system that will be needed once development is proposed? Why would you do this just for a 9.59 acre parcel? It doesn't pen out and seems to be a terrible waste of taxpayer dollars at a time when the economy simply does not support this type of wasteful spending. It seems the intelligent and prudent decision would be to wait until the Beavercreek Road Concept Plan is designed and adopted, along with the Title 4 lands. We feel this 9.59 acre parcel should be placed back into the Concept Plan and allowed to be developed as originally intended under MEV zoning.

The Hamlet of Beavercreek's **Findings** in the City's Staff Report is that many discrepancies exist in the statements. We do not believe the applicant has adequately demonstrated compliance with the Transportation Impacts, nor has the applicant proved

that a Zone change to MUC-1 would be desirable for this land. Rather it is more desirable to return this property to the Concept Plan, allowing it to be developed as intended and to be part of a "planned community". This property was intended to be the Cornerstone of the Concept Plan, however when taken away from the Concept Plan this current land use application will deter from the overall vibrancy and uniqueness originally intended for this land. The applicant has not demonstrated compliance with Goal 6.1 Air Quality, please note that Beavercreek Road is identified as a transportation corridor which is NOT walkable. The Hamlet feels Statewide Goal 14 has not been met. The applicant believes the proposed zoning and Comp Plan designation MUC 1 will be in concert with the goals of the city. We have already outlined that it would be best to keep this parcel in the Concept Plan where it will be developed as a planned community. These are just a few ways in which the applicant has failed to adequately demonstrate that this is the best use for this 9.59 acre parcel. It is probable that the Hamlet could have indicated more discrepancies if it had been given the opportunity to fully participate in the hearings before the Planning Commission.

Our final concern is regarding "Partnering". We ask that Oregon City partner with the Hamlet of Beavercreek, as well as other Hamlets and County CPO's bordering Oregon City. Often, Oregon City plans development without regards to it's effect upon the neighboring communities which is what has happened in these two land use applications. Development on either Beavercreek Road or Highway 213 could have detrimental affects upon the citizens living in Beavercreek, as well as other outlying rural areas, which is why we have placed strong emphasis upon this development. Oregon City seems oblivious to issues facing it's neighbors, therefore how can you appropriately plan for the future? The answer is, you simply cannot. Only by Partnering with your neighbors will you be able to achieve appropriate and efficient planning for this entire section of Clackamas County.

Planning into the future must change. The Hamlet of Beavercreek will be vigilant in the future as urban cities expand. We will be vigilant in protecting our rural lands, our small farms, our creeks and streams with fish and wildlife. We will protect and preserve our rural community and it's way of life. This is what the 6500 citizens of the Hamlet of Beavercreek have asked for. They want to design their future and the destiny of their community. We ask Oregon City to partner with our Hamlet on all future development and we ask that you show respect for our community and that you listen to the 6500 voices who are asking only to be heard and acknowledged.

At the October 6th, 2010 City Commission meeting, the city chose to extend an olive branch to the Beavercreek community by giving the Hamlet until 5 PM on October 13th to submit written testimony, however they are being bound, by the City, to testify only to the Staff Report and Application and have been forbidden to bring forth any new facts.

We continue to feel that Oregon City has breached the requirements of state Goal 1 by choosing to ignore the 6500 people of the Hamlet. At the upcoming City Commission meeting on October 20th, 2010, the City will have the opportunity to redeem it's latest actions upon the Hamlet of Beavercreek by making the decision to remand Land Use applications ZC 10-01 and PZ 10-01 back to the Planning Commission allowing the Hamlet of Beavercreek to **testify to any and all comments, concerns and facts,** rather than holding them hostage, stating they can only testify to the Staff Report and application.

The final decision now rests with the City. We ask that you consider the information we have brought before you in our letter. We ask that you acknowledge the request of the people of the Hamlet of Beavercreek by properly remanding Land Use applications ZC 10-01 and PZ 10-01 back to the Planning Department allowing them to appropriately participate in these land use hearings, as defined under citizen participation, in state Goal 1.

Representing the Board of The Hamlet of Beavercreek

Christine Kosinski
Corresponding Secretary and Co-Speaker
The Hamlet of Beavercreek

cc: Clackamas County Board of Commissioners
cc: Steve Wheeler, Clackamas County
cc: Cam Gilmour, Clackamas County
cc: Gail Curtis, ODOT
cc: Hamlet of Mulino
cc: Hamlet of Molalla Prairie
cc: Ray Valone, Metro
cc: Michael Jordan, Metro
cc: Carlotta Collette, Metro

The Hamlet of
BEAVERCREEK
PO BOX 587 · BEAVERCREEK · OREGON · 97004

Alice Norris, Mayor
Jim Nicita, Commissioner
Daphne Wuest, Commissioner
Doug Neeley, Commissioner
Rocky Smith, Commissioner
David Frasher, City Manager
City of Oregon City

October 20, 2010

RE: Land Use Application ZC 10-01 and PZ 10-01
19896 Beavercreek Road – Meyers and Beavercreek Road Intersection
9.59 Acre parcel brought into the UGB in 1979, annexed to the city in 2008
Contiguous to the Beavercreek Road Concept Plan

Honorable Mayor Norris and Commission:

The Hamlet of Beavercreek enters this letter into the City of Oregon City records for the above land use applications. The Hamlet extends their appreciation to Oregon City by recognizing the fact that the City gave them 7 days in which to respond to the staff report and application from the City. The Hamlet adequately responded within the given time frame.

We bring to your attention, that Tony Konkol, Planner for Oregon City, sent e-mail to the Hamlet last night at 6:38 PM attaching a staff memorandum from the City in response to the many concerns raised by the Hamlet of Beavercreek. Understand, that once again, this late notice did not give the Hamlet time to fully study the staff report and adequately respond to you tonight. We hope in the future that Oregon City will notify the Hamlet in a more timely fashion, giving them the necessary time to study the land use file and reply.

In our letter of October 13th, 2010, the Hamlet brought forth many strong concerns for consideration and questioned the reasoning of the City in allowing this zone change to be considered for approval. Even though, in Oregon City's staff memorandum, each of our concerns were addressed, it is consistently pointed out by city staff that the Hamlet of Beavercreek either failed to demonstrate which criteria are not met, or that there are

no facts offered to support this opinion, or that the Hamlet has submitted no cognizable evidence or credible argument to the contrary.

The Hamlet takes exception to these comments on the part of city staff. If the City had been dutiful and a good neighbor, we should have been rightfully notified in July of 2010 of the Planning Commission hearings for these land use applications. Because the Hamlet was notified, after the Planning Commission had already met and approved the application, they were completely left out and deprived of having the ability to fully participate from the beginning of the hearings in front of the Planning Commission.

Issues and concerns such as "piecemeal development" were not addressed in your staff memorandum and we continue to question the findings in the transportation report. For example, the City states it has made the finding that the Meyers Road extension improvement is "reasonably likely" to be provided by the planning horizon (year 2027). The Hamlet takes exception with the language "reasonably likely" and would like the City to replace this with language stating that the Meyers Road extension improvement **will be** built at the time development is approved for both of these land use applications at Meyers and Beavercreek Roads. To state "reasonably likely" is not good enough since we all recognize the fact that traffic in this area is already very heavy. To wait until the year of 2027 is far too late and not acceptable since traffic in this area will have become prohibitively difficult. The Hamlet of Beavercreek states that the Kittleson report and city staff report fails to identify any true mitigation for the transportation issues which currently exist. What you have proposed is simply NO mitigation that will be effective for these traffic impacts.

Also, under transportation in the city's staff memorandum, city staff states "the TIA was prepared in consultation with and reviewed by ODOT and city staff and found to comply with all applicable transportation standards." We point out once again that the Hamlet of Beavercreek was not invited to be a part of these meetings and therefore their concerns were never heard.

We question the lower density of this 9.59 acre parcel, even though you fail to recognize this in your staff memorandum. When this parcel was previously part of the Concept Plan, a much larger market and retail center were planned and this area was to be the "cornerstone" for this community. By taking it away from the Concept Plan, where will your "cornerstone" now be. We continue to have concerns that the city will request to transfer density in the future which is certain to place more density towards our rural lands.

We want you to know that the Hamlet does not question that Oregon City can legally do this, and we do not question your ability in this land use application, however we do question whether this zone change makes sense. Oregon City has dedicated much time, energy and hundreds of thousands of dollars into designing and developing a Concept Plan. Why is the City now willing to throw all of this away and now consider re-zoning this 9.59 acre parcel for just ONE person? Additionally, will the City do this for every other person involved in the Concept Plan? Do you realize you are setting a precedent for just ONE person? Are you willing to take this risk?

We wonder why the City is in such a hurry to approve this Zone Change from MEV to MUC-1 when the applicant is on record stating they propose NO development at this time. It makes more sense for the City to recognize it's neighbors by remanding this land use application back to the Planning Commission, allowing the Hamlet of Beavercreek to participate in these hearings.

Oregon City has fought the notification of the Hamlet of Beavercreek on a mere technicality. We feel that since this parcel is contiguous to the Beavercreek Road Concept Plan, and because 6500 people in the community of Beavercreek must rely daily on this road, that notice of the Planning Commission hearings should have been timely sent to the Hamlet of Beavercreek. For the record, the Hamlet of Beavercreek boundaries are only 826 feet from Land Use application Z10-01, therefore Oregon City is truly fighting the Hamlet over a technicality.

In ending, we continue to request that the City correct it's past actions upon the Hamlet and remand these land use applications back to the Planning Commission.

Additionally, we understand from County staff that Mr. Konkol has informally agreed to send all future land use application notices to both the Hamlet of Beavercreek (HOB), the Holcomb-Outlook CPO and the Central Point-Leland-New Era CPO, which are the three CPO's bordering the City of Oregon City. The Hamlet of Beavercreek requests the City Commission to act upon this agreement tonight by formally writing this agreement into City Code, and after approved, we ask that all land use notices be sent by both U.S. mail as well as e-mail, as a precaution in the event that mail is not timely delivered.

We sincerely thank you for recognizing the Hamlet of Beavercreek and their concerns regarding these land use applications. We look forward to working with you, as a partner, on all future land use applications.

Representing the Board of the Hamlet of Beavercreek

Christine Kosinski
Corresponding Secretary and Co-Speaker
The Hamlet of Beavercreek
Corr.sec@HamletofBeavercreek.org

cc: Clackamas County Board of Commissioners
cc: Steve Wheeler, Clackamas County
cc: Cam Gilmour, Clackamas County
cc: Gail Curtis, ODOT
cc: Hamlet of Mulino
cc: Hamlet of Molalla Prairie
cc: Ray Valone, Metro
cc: Michael Jordan, Metro
cc: Carlotta Collette, Metro

Christine Kosinski

OREGON CITY

Community Development – Planning

221 Molalla Ave., Suite 200, | Oregon City, OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

2014 AUG 11 PM 1:47

RECEIVED
CITY OF OREGON CITY

LAND USE APPLICATION TRANSMITTAL

July 24, 2014

CITY STAFF DISTRIBUTION	***MAIL-OUT DISTRIBUTION***
☐ BUILDING OFFICIAL ✓	☐ NEIGHBORHOOD ASSOCIATION _Caufield ✓
☐ DEVELOPMENT SERVICES MANAGER ✓	☐ NATURAL RESOURCES COMM. (NRC)
☐ PUBLIC WORKS- OPERATIONS ✓	☐ CLACKAMAS COUNTY TRANSP. & PLANNING ✓
☐ CITY ENGINEER ✓	☐ CLACKAMAS FIRE DISTRICT #1 ✓
☐ PUBLIC WORKS DIRECTOR ✓	☐ ODOT – Division Review ✓
☐ TECHNICAL SERVICES (GIS) ✓	☐ OREGON CITY SCHOOL DISTRICT ✓
☐ PARKS MANAGER ✓	☐ TRI-MET ✓
☐ ADDRESSING	☐ METRO ✓
☐ POLICE ✓	☐ OREGON CITY POSTMASTER
TRAFFIC ENGINEER	☐ DLCD
☐ REPLINGER AND ASSOCIATES ✓	☐ CITY ATTORNEY ✓
	☐ OTHER: _____
Mailed Notice to County CPO's	
☐ Central Pt-New Era-Leland / Holcomb-Outlook/Beavercreek ✓	
Mailed Notice	
☐ Within 300' ✓	

RECEIVED
CITY OF OREGON CITY
2014 AUG 11 PM 1:47

PUBLIC COMMENTS DUE:	6:00 p.m., August 11, 2014
REVIEW COMMENTS DUE:	6:00 PM, August 25, 2014
HEARING DATE:	Type II – Not applicable
HEARING BODY:	XX **Staff Review;** _____PC; _____CC
FILE # & TYPE:	SP 14-01: Site Plan and Design Review for a 121-unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1) – East side of Beavercreek Road
PLANNER:	Pete Walter, AICP, Planner (503) 496-1568
PROJECT WEBSITE:	http://www.orcity.org/planning/landusecase/sp-14-01-beavercreek-road-apartments-live-work-units
APPLICANT:	Beavercreek Road, LLC, Attn: Andrew Brand
LOCATION:	19896 Beavercreek Rd, Oregon City OR 97045 (See Vicinity Map on Public Notice) Clackamas County Map 3-2E-10C Tax Lot 800

This application material is referred to you for your information, study and official comments. If hard copies are required, please contact the Planning Department. Your recommendations and suggestions will be used to guide the Planning staff when reviewing this proposal. If you wish to have your comments considered and incorporated into the staff report, please return the attached copy of this form to facilitate the processing of this application and ensure prompt consideration of your recommendations.

Please check the appropriate spaces below. Attach additional pages if needed.

_____ The proposal does not conflict with our interests.

_____ The proposal conflicts with our interests for the reasons stated below.

_____ The proposal would not conflict our interests if the changes noted below are included.

_____

_____

_____

Signed_____

Title_____

PLEASE RETURN YOUR COPY OF THE APPLICATION AND MATERIAL WITH THIS FORM.

Mr. Pete Walter, Planner
City of Oregon City Community Development
221 Molalla Avenue, Suite 200
Oregon City, OR 97045

August 11, 2014

RE: SP 14-01: Site Plan and Design Review for a 121 unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1) Beavercreek and Meyers Roads

Testimony and Comments from: Christine Kosinski, Unincorporated County, Holly Lane

After studying the above land use application, SP 14-01, I cannot support this plan in going forward.

I feel I do not only speak for myself, but also for the more than 500 plus residents of the Holly neighborhood who have filled your Planning Commission and City Commission chanbers on several occasions with these same comments and concerns that I am giving you below:

Oregon City Planning Commission meeting of April 8th, 2013 (attached). My testimony made clear the fact that Holly Lane is a very fragile corridor filled with numerous Landslides, that at any time have the ability to re-activate. I also made the City aware that any attempts, by the City, to widen Holly Ln could cause these landslides to re-activate. I warned the City that these people are unable to obtain "Insurance that will cover losses due to Landslides". I asked the City if they were willing to take on this large risk. In the past two years, on more than six occasions, I have explained to the City Commission that my testimonies have made them aware of the terrible Landslide risks on Holly Lane and I then asked the City if they were willing to cover any and all landslides that may occur on Holly Ln due to excavation and/or grading that the City would undertake to widen the street. I never received an answer from the City, however they have been fully informed of the disastrous risks they would take on if they are ever to consider any roadway changes to Holly Ln.

Oregon City Commission Meeting of May 15th, 2013 (attached). My testimony made clear the fact that both the 6,500 residents of the Hamlet of Beavercreek (much of Holly lies in the Hamlet boundaries) and the more than 500 plus residents of the Holly Ln neighborhood were not contacted by the City regarding their intentions to include Holly Lane, and it's extensions, into Oregon City's TSP upgrade. I pointed to the thousands of "trips per day" that the City had planned to put onto Holly Ln as a result of the build out of the Park Park and Beavercreek Rd Concept Plans. On page 2, last paragraph of my testimony, I point out to the City that about 3/4ths of the TSP upgrades are affecting Holly Ln, that it is evident Beavercreek and Hwy 213 are failing and that the City is now planning to divert traffic away from these overcrowded arterials and put the traffic inland into residential areas filled with citizens, children and families.

Oregon City Commission Meeting of June 19th, 2013 (attached). My testimony here makes it clear to the City, that the good people of Holly Lane, are pleading with Oregon City to remove Holly Lane from their TSP upgrade, and why. The concerns for these homeowners to take on "personal liability" should the City try to upgrade this road, the Landslides and the fact that these citizens cannot obtain "insurance to cover losses due to landslides".

I refer you to the upgrade of the Oregon City TSP (D48, D57, D58, D59), where the intentions of the City couldn't be more clear, that the City is planning to extend Holly Lane from Henrici Road, across Maplelane, down Holly, across Redland Rd, then extending the street up to connect with Holcomb Road. This would virtually make Holly Ln several miles long, it would make it a major thoroughfare

where thousands of drivers each day would be forced to use this route due to clogged and failing arterial roads within the City which motorists presently use. The City seems all to willing to virtually sacrifice the safety and livability of the more than 500 people that presently live in the Holly Lane community. The City seems willing to "turn a blind eye" to the dangerous landslides which riddle Holly Ln, and the city continues to "turn a blind eye" to the fact that they knowingly understand these residents are unable to obtain "insurance to cover losses due to landslides", and the City still is willing not to listen to the pleas of these people and continues on a path to literally use these people as sacrifices for their own cause.

I therefore state NO, I do not in any way support the proposed development on Beavercreek and Meyers Road due to the fact, that in the next phase of development, the City will begin to build out the Holly Lane extension which myself and all my neighbors on Holly Lane stand firmly against.

Oregon City Planning Commission
April 8th, 2013 meeting

RE: L 13-01, Oregon City Transportation Plan

Testimony of: Christine Kosinski, Unincorporated Clackamas County, Hamlet of Beavercreek

Over the past several weeks I have given you compelling reasons to deny the proposed changes to the City's TSP and I have more for you tonight.

Remember a few weeks ago I spoke to you about Scott Burns, Professor of Geology, PSU. I am providing you with a copy of e-mail he sent to me in 2007 regarding the failure of the Thayer Rd Landslide, a Landslide that cannot be mitigated.

Next, is a copy of an Oregonian article of April 6th, 2013, "Couple sues over sinking home" claiming a reactivated landslide is harming their former Street of Dreams home. I have highlighted important facts in this article. The home was built in 2006, now 7 years later the home is sinking and legal action is being taken. This area is known to have locally perched shallow groundwater that can cause erosion and slope instability. The owners state they were not told the land was unstable, they claim excavation disturbed a natural spring (Holly Ln is filled with natural springs). Lastly, the owners state they were not told by the builder about landslide studies performed. ORS 105.462 to 105.490, in the State Property Disclosure law is the question "Is the property in a designated slide or other geologic zone"?

I question then who in their right mind would buy a home in Park Place where Landslides pose a huge threat and why is the City proposing to extend Holly Ln to Holcomb when they can't sell any homes here? Does the City propose to tell new property owners in Park Place they are moving into a Landslide area and that Insurance will cover NO losses? If no, then the City will risk this same type of litigation.

I refer you to the Landslide Map I have given you. The first "pink marker" is the Newell Creek Apartment Landslide, the second "pink marker" is a home on Holly Ln that is 220 feet away from a huge deep seated ancient landslide. If Holly Ln is widened here to 120 feet, this slide can be disturbed and reactivated, if so, the slide will not only block Holly, but will come down on Hwy 213 as well. The third "pink marker" marks a home that is 329 feet from Holly and was totally destroyed in 1996. A new home was built on a new site, but again widening Holly here could very well reactivate this deep seated ancient landslide. The final "green marker" indicates Country Village, where landslides took out several homes and further development was halted. I can give you more examples of the risk you are taking in attempting to widen Holly. Remember, the people of Holly Lane ***CANNOT BE INSURED FOR LANDSLIDES***. If any of their properties slide in the years ahead, as a result of your attempts to widen Holly Ln, unfortunately they will be forced to look to the city to recover their losses. Are you willing to take on this large risk?

A resident of Holly Ln did come to City Staff with an alternate plan for a new north/south connector, this route would have opened many opportunities for the City to expand it's Commercial/Industrial base. City staff turned the plan down saying the proposed roadway was outside the UGB.....well you know what.....Holly Lane is also outside the UGB???

SUSCEPTIBILITY MAPS – DOGAMI will release the maps in May. At this time I am requesting that Oregon City "Keep This Hearing Open" for these maps. DOGAMI is working quickly to make the maps available for you. Oregon City simply cannot make any decisions on their TSP without this important new information, information which may well show Holly Ln as a seriously hazardous area. I'm sure you have technical questions about the maps. Professor Bill Burns of DOGAMI stated he would be happy to help the City and Commissioners with any questions or concerns regarding the susceptibility maps and the landslide issues that surround Holly Lane. Just call DOGAMI and ask to speak with Bill Burns, their phone number is (971) 673-1555.

The two biggest threats for Holly Lane are Landslides & Safety for the people. Without a doubt, the City is unable to meet the requirements of Goal 7 "To reduce risk to people and property from natural hazards". The City continues to develop in the Holly Ln area and is simply shoving heavy traffic down Holly Lane, however the City has been, and continues to be irresponsible. The City has been warned many times that speeding and heavy traffic is jeopardizing the lives of the people living on Holly Lane. Yet the City proposes a roundabout at Holly and Maplelane with NO improvements to the rest of Holly. I want you to realize that if anyone is seriously injured on Holly, they may well take recourse upon the city. I know myself I have openly talked to the City about the decaying safety conditions on Holly due to the City's ramped up development, all without regard for the people's safety.

I wrote an article a couple of years ago about traffic, Holly Lane and the Park Place Plan, the article was titled "Empty Promises and Broken Dreams." That is exactly the hand that Oregon City has dealt to the people of Holly Lane. The Planning Commission has the ability to deny this insane transportation plan where Holly Lane continues to be victimized by this City. Who will stand up and provide Safety for these people? Do you have the courage to send this plan back to committee, where a member of the Hamlet or of Holly Ln can be appointed to the panel to represent the needs of these people?

In ending, I request that this hearing be left open until the Susceptibility Maps from DOGAMI are received and thorougly reviewed by both the City, DOGAMI and the people of Holly Lane. Furthermore I request that the hearing be left open until a complete Geological Review and Study is performed for the entire length of Holly Lane and proposed extension of Holly to Holcomb.

Remember, in 1993 the City did not listen to Professor Scott Burns and his students when they stated "do not build in Newell Canyon", the city built and the buildings fell. You don't want to make this same mistake again.

So what will it be, will you support and protect the safety of the people of Holly Lane, or will you simply give us more "Empty Promises and Broken Dreams"?

Oregon City Commission
Meeting of May 15th, 2013

RE: PC 13-047 Transportation System Plan Update

Testimony of: Christine Kosinski, Hamlet of Beavercreek, Unincorporated Clackamas County

I am here to represent the concerns of The Hamlet of Beavercreek (HOB) and the people of Holly Lane regarding your intentions to include Holly Lane, and its extensions, into your TSP upgrade.

At the March 11th Planning Commission meeting I did bring forth concerns that the City has placed Holly Ln in its TSP, but never did ask the hundreds of citizens of Holly Ln nor the 6500 people residing in the HOB to be part of the planning process. I further stated that the people of Holly Lane, outside the UGB had never received any notices from the City regarding their intentions to include Holly in their TSP. John Lewis and Laura Terway felt that the Hamlet had been invited as a stakeholder, but proof of this was not available at the time.

John Lewis did ask Laura to send a notice of meeting dates and times to the people of Holly Lane, outside of UGB, these notices were received by most on March 20th. These citizens continue to be upset because the City did not reach out and ask a member from the HOB or a citizen of Holly Ln to sit on the city's Transportation Committee to represent their concerns. They feel the City wants their street, but has excluded each of them in every part of the planning process Yes, I have heard explanations that the City met it's legal obligations in posting notices in various places, however I feel you were morally and ethically bound to include the 600 plus people of Holly Ln in these important planning decisions, but you chose not to which is a failure to meet the requirements of Goal 1.

The idea to extend Holly Lane to Henrici on the South and to Holcomb on the North, came out of the Park Place Concept Plan. It was explained to the community that a Concept Plan is like a dream, if you could dream what would you like your neighborhood to look like. After many community and city meetings, it became clear that transportation and the need for roads was one of the biggest challenges for this plan due to the difficult topography of this area.

As the planning process continued, it was very evident there were no good, stable areas for roads within the concept plan, however the City had to meet ODOT, Metro and State requirements to gain approval for the plan, therefore the Holly Ln extension to Holcomb and the Swan Rd extension were put into the plan. Again, this was all a big dream and there was no clear evidence that either of these roads could even be built. Additionally, neither Holly nor Swan were studied or reviewed as possible roadways in the Preliminary Geological Study, therefore the City was ignorant whether it was even possible to build either of these two proposed roads, but remember, these roads are just One Big Dream!

I want to point out that during the Concept Planning period, Kittleson and Associates stated to the City that the Park Place Plan would generate from 16,000 to 20,000 ADT"s per day with many of these vehicles using Holly for North/South travel. The Beavercreek Rd Concept Plan was to generate about 13,000 residential ADT's and 33,000 commercial ADT's per day, with many motorists choosing to use Holly.

In studying your current TSP update, you are now forecasting many, many more trips than those which you originally proposed to both the people of Holly Ln and to the HOB. I note you are planning to extend several more streets across Beavercreek Road and connect them into Holly. This traffic could virtually put 50,000 vehicles and more per day down Holly Ln, a street where most homes sit very close to the road. You are planning to build more than a Sunnyside Road and more than a Harmony Road, you are planning to build a Freeway through a residential neighborhood that sits in a corridor of huge landslides and unstable soils.

Oregon City has been developing far too much residential without the proper Infrastructure necessary to support this large development. Many citizens have been telling you this for years, you did not listen and now the birds have come home to roost. There simply are not enough roads in this City to support this high amount of development, and now you are asking the people of Holly Lane, and the other few County roads to pull you out of a pickle.

In studying your TSP it is evident that about 3/4ths of your upgrades are affecting Holly Lane, and it is further evident that Beavercreek and Hwy 213 are failing and that you now are planning to divert traffic away from these overcrowded arteries and into smaller interior roads where you are placing people, children and families in harm's way. You have conveniently planned to pull traffic away from Beavercreek, placing it through the Beavercreek Concept Plan and up into Thayer and Maplelane, virtually parelling Beavercreek Road. The same holds true for Holly Ln, Hwy 213 is failing so Holly will be used as a dumping ground for the thousands of vehicles that cannot fit onto the arterial grid. It is sad that you are willing to sacrifice the safety of the people, who don't even live in your city, because you have over developed without the proper infrastructure.

It was not fair for you to tell this community to Dream and then hand them a Nightmare!

City Commission Meeting June 19, 2013

RE Plan File L 13-01 & L 13-02
Oregon City Transportation System Plan Update

Testimony of: Christine Kosinski, Unincorporated Clackamas County
Hamlet of Beavercreek

I have come before you for more than 8 years, in this time, you have come to understand much about Holly Lane, it's dangers, landslides, and you've certainly heard alot about heavy, speeding traffic and unsafe conditions that exist on our street.

While it is true that after 8 years I can bring more concerns to you, I think it is important for you to know about the good people who live on Holly Lane. These are the same citizens who just a few weeks ago almost filled this room to speak to your Planning Commissioners about their concerns and fears, and just what it is like to live on Holly Lane, where speeding traffic prevails.

The people of Holly Ln are just the best, good, caring, hardworking and honest people. One of our people lived here as a small boy. It was his dream to retire here one day, and yes, he is back with his family, very happy to be back on Holly, we have a family living in an original Holly Ln home built by their Grandfather many years ago. We can count on our neighbor across the street, who every Fall brings us the most beautiful Tomatoes in all colors of the rainbow and the most succulent, sweet Corn you have ever tasted. Another neighbor, now in his 90's, lives in his original Holly Ln home, a home that slid almost down to Hwy 213 in the 1950's landslides, with the help of family and friends, the home was lifted onto rollers, where day by day the home was slowly rolled back up to Holly to a new homesite.

Then our neighbors beyond the curve, who have suffered emotional toil and thousands upon thousands of dollars in property losses due to the slides of 1996. They did not abandon Holly, they rebuilt and plan to stay here for a long time.

These good people are asking Oregon City to remove Holly Lane from their TSP Upgrade.
Holly Lane serves this City no purpose. We have well outlined the fact that this is an area comprised of Stream Sediments which cannot bear the heavy weight of development or the pounding of heavy traffic. This street has suffered landslides in the 1950's, 1970's, in 1995, 1996 and 1997. It is only a matter of time before the earth slides violently again. Heavy grading or widening of the street will only exacerbate the re-activation of these slides.

Removing Holly Ln means you can satisfy all demands and quell the fears of these people. This short 1 1/2 mile stretch of a narrow road can't possibly take the amount of added ADT's that you are planning for it. You are looking for a miracle where none exists.

Please, these caring and good people are pleading with you to give them back their neighborhood and let them finally have some peace in their lives. Please remove Holly Ln from your TSP.

Recieved by Email 10/31/14
- PJW

TO: Pete Walter, Planner, Oregon City

FROM: Elizabeth Graser-Lindsey, 21341 S. Ferguson Rd., Beavercreek, OR 97004

DATE: October 31, 2014

SUBJECT: Land Use Application SP 14-01 (Beavercreek Rd.)

This development cannot go ahead in the absence of proper planning for infrastructure as required by regional and city law. (See previous letter). Because the application is being considered without the proper planning document including the concept plan, the infrastructure is being considered piecemeal despite the fact that the project is in and part of the Beavercreek Road Concept Planning area. The concept plan area needs transportation, sewage and water sufficient for the entire concept plan. The applicant and city need to address the overall infrastructure needs of the concept plan area, not bring in piecemeal infrastructure that ignores the overall needs of the area.

Transportation. Beavercreek Rd. needs to be sized so that the entire concept plan transportation load can be accommodated, not hemmed in by buildings right on the right-of-way that prevent predictable needed ~~with~~ width of Beavercreek Rd. and which encroach into the roadway currently used as bikeway/pedestrian way and emergency shoulder. In addition, the traffic count tubes that were recently (within a couple weeks) installed adjacent to this property were not properly placed across the bicycle lanes to get complete traffic counts. This development would harm and degrade the transportation infrastructure used by current Oregon City residents in violation of City Code (this evidence is part of the concept plan appeal, which resulted in a remand, which was previously submitted in response to this development).

Water. The water service to the concept plan areas needs to accommodate the entire concept plan area. Having this property asking for special service from CRW does not solve the overall problem, but actually makes it worse by this development not helping to pay for the pipes needed to serve the entire concept plan area. That the CRW acknowledges (8-22-14) the developer's request is not an agreement to provide water and does not meet the current need to show water service can be provided. The city is to be the water provider to this city property and the rest of the city development in this area. The City is unable to provide the necessary volume of water without building out its water system (to provide storage and pressure) and apparently there aren't the resources including finances to do so. There is no evidence that CRW is able to continue to serve piecemeal development in the Beavercreek Rd. concept plan area and this piecemeal approach was to be avoided by concept planning.

This request also potentially could compromises the ability of CRW to serve its core rate payers and others within its district that haven't yet built out. For example, climate change is reducing the summer flows of this district with little water storage capacity and drought in California could cause an increased demand for irrigated food produce/vegetable production from properties in the CRW district. Because the district is likely to have first choice of its district water, this development could be left without adequate water in a droughty year.

Sewage. The approach to sewage is piecemeal as well. As consultants Keller (9-9-14) and Brown and Caldwell (cited by Keller) acknowledge, "the best long-term approach for servicing the entire Beavercreek service area appears to be a new sewer trunkline along S. Beavercreek Rd. This service approach ultimately directs available capacity in the Glen Oak Road Sewer and the downstream pipeline in Hwy 213 for undeveloped areas adjacent to these pipelines, while providing for build-out of both the Beavercreek and Glen Oak service areas." Using current lines while

possible apparently puts the lines very near total capacity as it is recommended that ~~he man of bolted down, sealed man hole covers.~~ "that the manhole covers be bolted and sealed down." Besides being an obvious public health and safety risk, this use of the sewage line so near its total capacity both would hinder Oregon City from handling ordinary development in the area (including Oregon City urban reserves in the vicinity) and it would interfere with the real need for the new sewer trunkline being implemented, with this development paying its fair share, so the whole concept plan area can be served properly as was promised to the public.

The development application is not timely with the sewage master plan at the time of submittal.

Public Services. The fire department serving the Hamlet of Beavercreek and surroundings reports that 52.35% of responses in Beavercreek served by the Beavercreek station take longer than 6:24 minutes. This apparently puts many calls over the service standard. 10% of the calls are served by the Oregon City Hilltop station which has a (4 minute longer) response time of over 10 minutes. (See accompanying email). Beavercreek Rd. is already bogged down by the high school speed zone and it has been called a cul du sac because it is the only way in and out of Beavercreek. Any further bogging down of Beavercreek Rd. by on-street parking on this arterial and more cross traffic will further slow medical and fire responses and can cost people their lives.

There has been no evidence that the police can service this area adequately. In the past (around the time the remanded concept plan was under consideration), the police said that they could not even serve the area with decent response times when it wasn't developed; the degree to which this situation has been corrected has not been clarified as is needed.

Miscellaneous: The file is not complete in that the service district responses do not document the availability of water and sewage; however, the public comment period ends before the documents appear. The public is not being allowed to respond to a complete application.

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

REVISED LAND USE APPLICATION TRANSMITTAL (New Application Material)

October 17, 2014

CITY STAFF DISTRIBUTION	*MAIL-OUT DISTRIBUTION*
❑ BUILDING OFFICIAL ✓	❑ NEIGHBORHOOD ASSOCIATION _Caufield ✓
❑ DEVELOPMENT SERVICES MANAGER ✓	❑ NATURAL RESOURCES COMM. (NRC)
❑ PUBLIC WORKS- OPERATIONS ✓	❑ CLACKAMAS COUNTY TRANSP. & PLANNING ✓
❑ CITY ENGINEER ✓	❑ CLACKAMAS FIRE DISTRICT #1 ✓
❑ PUBLIC WORKS DIRECTOR ✓	❑ ODOT – Division Review ✓
❑ TECHNICAL SERVICES (GIS) ✓	❑ OREGON CITY SCHOOL DISTRICT ✓
❑ PARKS MANAGER ✓	❑ TRI-MET ✓
❑ ADDRESSING	❑ METRO ✓
❑ POLICE ✓	❑ OREGON CITY POSTMASTER
TRAFFIC ENGINEER	❑ DLCD
❑ REPLINGER AND ASSOCIATES ✓	❑ CITY ATTORNEY ✓
	❑ OTHER: _____
Mailed Notice to County CPO's	
❑ Central Pt-New Era-Leland / Holcomb-Outlook/Beavercreek ✓	
Mailed Notice	
❑ Within 300' ✓	

COMMENTS DUE:	5:00 p.m., October 31, 2014
HEARING DATE:	Type II – Not applicable
HEARING BODY:	_XX_ **Staff Review;** _____PC; _____CC
FILE # & TYPE:	SP 14-01: Site Plan and Design Review for a 121-unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1) – East side of Beavercreek Road
PLANNER:	Pete Walter, AICP, Planner (503) 496-1568
PROJECT WEBSITE:	http://www.orcity.org/planning/landusecase/sp-14-01-beavercreek-road-apartments-live-work-units
APPLICANT:	Beavercreek Road, LLC, Attn: Andrew Brand
LOCATION:	19896 Beavercreek Rd, Oregon City OR 97045 (See Vicinity Map on Public Notice) Clackamas County Map 3-2E-10C Tax Lot 800

This application material is referred to you for your information, study and official comments. If hard copies are required, please contact the Planning Department. Your recommendations and suggestions will be used to guide the Planning staff when reviewing this proposal. If you wish to have your comments considered and incorporated into the staff report, please return the attached copy of this form to facilitate the processing of this application and ensure prompt consideration of your recommendations.

Please check the appropriate spaces below. Attach additional pages if needed.

_____ The proposal does not conflict with our interests.

_____ The proposal conflicts with our interests for the reasons stated below.

_____ The proposal would not conflict our interests if the changes noted below are included.

_____

_____

_____

Signed_____

Title_____

PLEASE RETURN YOUR COPY OF THE APPLICATION AND MATERIAL WITH THIS FORM.

The Hamlet of
BEAVERCREEK
PO BOX 587 · BEAVERCREEK · OREGON · 97004

Mr. Pete Walter, Planner
City of Oregon City Community Development
221 Molalla Avenue, Suite 200
Oregon City, OR 97045

October 31, 2014

RE: Notice of Limited Land Use Application (Second Notice) October 17, 2014
SP 14-01: Site Plan and Design Review for a 121-unit Apartments
and 62 Live-Work Units on 9.7 acres (Zoned MUC-1)
East side of Beavercreek Road

Comments from The Hamlet of Beavercreek (due October 31st, 2014) regarding the subject proposed Site Plan and Design Review for property located at 19896 Beavercreek Road are listed below.

As previously stated in our letter of August 11th, 2014, The Hamlet of Beavercreek did not receive the First Notice of this land use application from Oregon City. Because land use notification from Oregon City to The Hamlet of Beavercreek has continued to be an outstanding issue, we contacted your Planning Department with our concerns and were told that your e-mail notification system needed to be updated. Therefore, we gave you our e-mail contact information and look forward to receiving all future land use applications.

The Hamlet of Beavercreek is in receipt of your Second Notice of October 17th, 2014, and after reviewing both the new documents and studies outlining your plan for development, The Hamlet of Beavercreek finds, that once again, they do not support this Land Use application for the following reasons.

1) The Hamlet of Beavercreek requests that the City provide an **additional comment period**. It is not fair of the City to impose a deadline period for comments when its plan for development is incomplete and may lack the necessary compliance to meet State regulatory requirements for development.

2) Oregon's Statewide Planning Goal 1 *Citizen Involvement* – to meet the requirements of Goal 1, citizens are to be involved in "all phases" of the planning process, which has not happened in this plan for development. Much of the Planning by the City had already taken place without citizen involvement, prior to Notice 1 or Notice 2 being sent out. With the mailing of each Notice, citizens and CPO's were given only two weeks to Comment. In the case of Notice 2, which was e-mailed on October 17th, the deadline for comments is October 31st, and yet there are still significant issues to be resolved, such as the ability to provide water and sewer services. Once the City and the developer are able to finalize all outstanding needs and infrastructure, it is only appropriate that the City provide another comment period to allow the citizens to participate in the final stages of planning

3) This proposed plan for development will bring a plethora of SAFETY issues for the 6,500 people living in the Beavercreek community. You are proposing to add sidewalks, bike lanes and parallel parking along Beavercreek Road. In addition, the future Bus barn (located on an extension of Meyers Road) will have buses both entering and exiting via Beavercreek Road and you are proposing a Tri-Met stop at Meyers Road as well. All of these will greatly diminish the current width of Beavercreek Road increasing queuing at the intersection as well as this entire section of Beavercreek Road. The response times for lifesaving services, such as Fire, Police and Ambulance will be greatly impacted, placing citizens in harm's way. **As an example: An accident occurred on Beavercreek & Glen Oak just last week, tying up traffic for more than two hours! If the Hilltop Fire Station would have been covering an emergency call for the Beavercreek Station, would they have made it down Beavercreek Road through this dense traffic and how poor would their response time have been? Did Oregon City even consider the impact that this proposed development will have upon the thousands of people living in the Beavercreek community?**

4) The current response time for the Beavercreek Fire station is 6.24 minutes. When the hilltop fire station must cover, and comes into Beavercreek, the response time is 10.18 minutes. Considering that a person cannot be deprived of oxygen for more than four minutes before suffering serious brain damage, the difference between 6.24 and 10.18 is already far too great. When factoring in the large amounts of added trips per day from this development, especially into the intersection of Beavercreek and Meyers Roads, it is evident that the response times will be much higher than the current 10.18 minutes if the hilltop station must respond to a call in the Beavercreek community.

5) Beavercreek Road is the sole north access for the people of Beavercreek. Your proposed plan for development at Beavercreek & Meyers will create a bottleneck, hemming in Beavercreek Road with no ability to widen for future development. Parking along the arterial will further reduce traffic flow already restricted by the high school speed zone and high traffic volumes.

6) The Average Daily Trip count is seriously understated. Based on your **810 trips per day-** , this calculates out to only **4.43 trips per day from each residence;** however, the City is charging monthly road maintenance fees at a much higher rate (which does not compute). Have you accounted for the extra trips to and from the Live/Work units? The hundreds, if not thousands of trips, to and from retail and commercial outlets have not been included. Have you accounted for the ADT's per day from and to the Bus Barn, including employee trips? Have you accounted for the ADT's per day, coming into the Beavercreek/Meyers Intersection, from the newly approved, Linn-Leland-Meyers Corridor? And lastly, what about the ADT's that will come into the Beavercreek & Meyers Rd area from an Enterprise Zone, if awarded to Oregon City?

7) There has been inadequate general planning, as well as a lack of funding and concurrency for this proposed development, due to NO concept plan.

8) The City should Master Plan this proposed development at Beavercreek & Meyers Roads. Although the parcel measures 9.7 acres (which barely fails to meet the 10 acre threshold), when you consider that the City is also planning for the 8 acre Bus Barn and Maintenance Facility in this same area, both of these projects together exceed the 10 acre or more threshold. A Master Plan incorporates the entire area where development is planned in the next five to twenty years. The Plan assures that sufficient Infrastructure is identified and planned for, such as Sewer, Water, adequate transportation, financing, just to name a few. To develop this parcel, without a Master Plan, would indicate a serious lack of proper planning by the City resulting in even more serious livability and safety issues.

9) It appears that delivering water remains an outstanding issue. The city reservoirs are too low to serve the area and an IGA will be needed if CRW is to service the area. Additionally, there were initial concerns that a Sewer hook-up at Glen Oak would not be adequate to service the proposed development, but now it seems that Glen Oak is being reconsidered, even though the best solution for adequately serving the area could possibly be to utilize a separate new line placed down Beavercreek Road.

10) The City has not identified stable financing for a Sewer and Water plan to service the needs of this entire area, to include all townhouses, live-work units, high school, new bus facility, in-fill and other development in the area. It would be shameful to think that the City expects its ratepayers to cover the costs for the new Sewer Master Plan. The people have already had a recent raise in Sewer rates, with another to follow next year and a possible bond measure to finance the balance. As a reminder to the City, this comes to your people at a time when they are struggling to put food on their tables, gas in their cars, and clothes on their backs. Please consider the taxation and fees you are placing upon your people during these difficult times.

11) This project should not go forward because this proposal for development requires a valid concept plan according to LUBA's Final Opinion and Order, LUBA Case 2007-171. When this 9.7 acres was annexed into Oregon City, LUBA stated that annexation could go forward, but with the understanding that the concept plan would proceed urbanization

12) We question, why now is the City attempting to develop these 9.7 acres outside of the concept plan and contradictory to LUBA's Final Opinion?

The outstanding problems noted above, the lack of citizen participation, the need to do a Master Plan to identify, and provide for, the necessary infrastructure needed to support the large amounts of development being proposed in the Beavercreek Road area, the lack of providing SAFETY for the people of The Hamlet of Beavercreek, what about those response times for emergency vehicles, did you make SAFETY a priority since your plan could virtually "almost close down" Beavercreek Road as an easy access into and out of The Hamlet of Beavercreek.

Did anyone consider inviting the Hamlet of Beavercreek to be a partner in the planning of this development that will have great effects upon their everyday lives? There has been inadequate general planning, a lack of funding, lack of proper transportation plan, no concurrency, incorrect ADT's in the traffic plan and there remains the question of who will be able to deliver water and sewer services to these 121 Apartments and 62 Live-Work units?

It is the concern and fear of the citizens of The Hamlet of Beavercreek that the City of Oregon City will turn Beavercreek Road into a future Sunnyside Road. As a result, Clackamas County spent in the last decade, millions upon millions of dollars resolving poorly planned growth by the City of Happy Valley and Clackamas County. Clackamas County does not and will not have the funds to fix another Sunnyside Road. Therefore, it is the responsibility of Cities and the County to assure appropriate and effective planning and concurrency.

And if these are not enough reasons to say "NO" to this development, then why is the City attempting to develop these 9.7 acres, outside of the concept plan which is contradictory to LUBA's Final Opinion?

Sincerely,

Christine Kosinski

Christine Kosinski
Corresponding Secretary
The Hamlet of Beavercreek
Cor.Sec@Beavercreek.org
503-656-1029

CC: Clackamas County Board of County Commissioners
John Ludlow, Chair
Martha Schrader, Vice Chair
Commissioner Jim Bernard
Commissioner Paul Savas
Commissioner Tootie Smith

Mike McCallister, Director of Planning, Clackamas County
Rick Nys, Senior Traffic Engineer, Clackamas County
Mike Bezner, Transportation Engineering Manager, Clackamas County
Ken Kent, Senior Planner, Land Use Review Coordinator, Clackamas County
Barbara Smolak, Public and Government Affairs, Clackamas County
Betty Johnson, Engineering Associate, Clackamas River Water
Bob George, PE, Chief Engineer, Clackamas River Water

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

REVISED LAND USE APPLICATION TRANSMITTAL (New Application Material)

October 17, 2014

CITY STAFF DISTRIBUTION	*MAIL-OUT DISTRIBUTION*
❑ BUILDING OFFICIAL ✓	❑ NEIGHBORHOOD ASSOCIATION _Caufield ✓
❑ DEVELOPMENT SERVICES MANAGER ✓	❑ NATURAL RESOURCES COMM. (NRC)
❑ PUBLIC WORKS- OPERATIONS ✓	❑ CLACKAMAS COUNTY TRANSP. & PLANNING ✓
❑ CITY ENGINEER ✓	❑ CLACKAMAS FIRE DISTRICT #1 ✓
❑ PUBLIC WORKS DIRECTOR ✓	❑ ODOT – Division Review ✓
❑ TECHNICAL SERVICES (GIS) ✓	❑ OREGON CITY SCHOOL DISTRICT ✓
❑ PARKS MANAGER ✓	❑ TRI-MET ✓
❑ ADDRESSING	❑ METRO ✓
❑ POLICE ✓	❑ OREGON CITY POSTMASTER
TRAFFIC ENGINEER	❑ DLCD
❑ REPLINGER AND ASSOCIATES ✓	❑ CITY ATTORNEY ✓
	❑ OTHER: _____
Mailed Notice to County CPO's	
❑ Central Pt-New Era-Leland / Holcomb-Outlook/Beavercreek ✓	
Mailed Notice	
❑ Within 300' ✓	

COMMENTS DUE:	5:00 p.m., October 31, 2014
HEARING DATE:	Type II – Not applicable
HEARING BODY:	_XX_ **Staff Review;** _____PC; _____CC
FILE # & TYPE:	SP 14-01: Site Plan and Design Review for a 121-unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1) – East side of Beavercreek Road
PLANNER:	Pete Walter, AICP, Planner (503) 496-1568
PROJECT WEBSITE:	http://www.orcity.org/planning/landusecase/sp-14-01-beavercreek-road-apartments-live-work-units
APPLICANT:	Beavercreek Road, LLC, Attn: Andrew Brand
LOCATION:	19896 Beavercreek Rd, Oregon City OR 97045 (See Vicinity Map on Public Notice) Clackamas County Map 3-2E-10C Tax Lot 800

This application material is referred to you for your information, study and official comments. If hard copies are required, please contact the Planning Department. Your recommendations and suggestions will be used to guide the Planning staff when reviewing this proposal. If you wish to have your comments considered and incorporated into the staff report, please return the attached copy of this form to facilitate the processing of this application and ensure prompt consideration of your recommendations.

Please check the appropriate spaces below. Attach additional pages if needed.

_____ The proposal does not conflict with our interests.

_____ The proposal conflicts with our interests for the reasons stated below.

_____ The proposal would not conflict our interests if the changes noted below are included.

_____

_____

_____

Signed_____

Title_____

PLEASE RETURN YOUR COPY OF THE APPLICATION AND MATERIAL WITH THIS FORM.

Mr. Pete Walter, Planner
City of Oregon City Community Development
221 Molalla Avenue, Suite 200
Oregon City, OR 97045

October 31, 2014

RE: SP 14-01: Site Plan and Design Review for a 121 unit Apartments and 62 Live-work Units on property of 9.7 acres (Zoned MUC-1) Beavercreek and Meyers Roads

Testimony/Comments from: Christine Kosinski, Unincorporated Clackamas County, Holly Lane

After receiving the Second Notice for the above proposed development, and reviewing the documents and information the City has provided on its website, I cannot in good conscience, support this plan for development for the following reasons:

1) The transportation plan for this proposed development is poorly planned and severely underfunded. To propose development of 121-3 story apartments and 62 live-work units without the proper infrastructure to support the large amount of development being planned for this part of Beavercreek Road, is simply irresponsible. In Oregon City's latest TSP, Beavercreek Road is shown with an ROW width of 94', however, considering that the city is proposing to add sidewalks, bike lanes and parallel parking on Beavercreek, all of these additions will grossly narrow the road which is already inundated with traffic.

2) The addition of a new Bus Barn and Maintenance Facility in the same area must be considered as hundreds of bus trips per day will enter and exit Beavercreek Rd. The City has recently approved the Linn-Leland-Meyers Corridor which will bring much traffic into the Beavercreek/Meyers Intersection and now add the fact that the City is proposing a Tri-Met bus stop at Meyers Road. All of these hundreds and hundreds of additional ADT's per day into this intersection will surely be enough to cause it to fail. Since Beavercreek Road is the one and only thoroughfare serving a huge population base, it is extremely important that measures be taken to insure that this major intersection remains clear and open. Beavercreek Road serves more than 6500 people in the Beavercreek Community, it is their only way in and out of Beavercreek. The addition of the High School has already begun to create a bottleneck at the intersection. This proposed development will only add to an already looming problem.

3) Safety for the people is being sacrificed because the infrastructure necessary to support the heavy development, which the City is planning for this area, is not being funded and is not being proposed as part of this development. Because Beavercreek Road is the only Major Arterial in this area, the clogging up of the road and the intersection will slow response times for emergency vehicles trying to get aid to the people. It is wrong for the City to plan any development that will jeopardize the people in any way. By narrowing and placing dense traffic into this corridor, Safety will be a major issue for those motorists coming in from the Beavercreek area.

4) In the planning documents, the City states, that college students living in the apartments, can walk to the College by using the Bike-Ped lanes along Beavercreed Road. Nothing was stated about the danger these students would face, walking along a Major Arterial with thousands of cars bypassing them, often at high speeds. Safety in development must never be compromised.

5) There is a lack of funding for providing the necessary infrastructure to support the heavy development being proposed for this area. Development is, unfortunately, being approved by the City with NO ROADS being built to support the dense development being undertaken. This happens when "concurrency" is not part of planned development.

6) Since 2004, the lack of roads to support new development has been a hotly debated subject. Holly Lane is the only North/South connector between Beavercreek and Redland Roads. These people have literally begged Oregon City to build at least one to two more North/South connectors to support the dense development they were proposing, but all of their pleas simply fell on "deaf ears". The City has been derelict in it's duties to provide Safe and Livable communities because it has chosen to develop "On The Cheap", rather than to provide the roads which the people greatly need. Developing roads and necessary infrastructure are one of the major uses of Urban Renewal Funds and should be considered by the City.

7) Statewide Goal 1, requirements for Citizen Involvement, have not been met by the City for this development. Oregon City did not reach out to the people of Holly Ln, to partake in ANY planning for this development, even though the next phase of development in this area, will directly link traffic to Holly Lane, a small and windy country road filled with landslides. Oregon City also did not reach out to the Hamlet of Beavercreek (most of Holly Ln lies within the Hamlet boundaries). The Hamlet also will be greatly effected, especially by the denser traffic that this development will place upon Beavercreek Road, which is the only way in and out of the Beavercreek community. The City's own Caufield Neighborhood Assn was invited to a meeting at the College since their neighborhood will be effected by this development, and yet both Holly Ln and the Hamlet of Beavercreek were completely left out, leaving Oregon City out of compliance with Goal 1, which clearly states that citizens be involved in ALL Phases of Planning.

8) In the LUBA review, when this property was annexed into Oregon City, LUBA agreed that the annexation could proceed the Beavercreek concept plan, with the understanding that the concept plan would proceed urbanization. Therefore, why is the City proposing development on these 9.7 acres without the concept plan going first?

9) The Average Daily Trip count of 810 trips per day is vastly incorrect. Trip counts must be added for the new Bus Barn and Maintenance Facility, where buses will enter and exit Beavercreek Road on a daily basis, the trips coming in from the newly approved Linn-Leland-Meyers Road Corridor, trips from and to the Live-Work units have not been counted.

10) In my first letter to the City, of August 11th, 2014, I enclosed my testimonies to the City, dated April 8th, 2013, May 15th, 2013 and June 19th, 2013. These testimonies made it clear to the City that Holly Lane is a street riddled with dangerous Landslides. These Landslides have re-activated, and struck Holly Lane in the 1950's, 1970's, in 1995 and 1996, just to name a few of the years in which Landslides have devastated this long and windy street where hundreds of people reside. I also have testified on numerous occasions to the City, that the people of Holly Lane are unable to obtain "Difference In Conditions Insurance". This is the only type of Insurance that, in some instances, may cover some losses due to landslides. The problem is that almost all Insurance companies no longer offer this type of insurance and Landslide insurance is not available through the government. Oregon City does have Holly Lane in it's TSP as it continues to plan to use this North/South connector in a very heavy manner. Holly Ln residents have gone on record several times with the City, that performing any excavating and/or

widening of Holly Lane is close to impossible due to the fact that this heavy type of roadwork will probably cause one or more landslides to re-activate. We questioned the City, who will pay for these losses? The City is aware that the people are unable to obtain insurance to cover losses due to landslides, and yet, the City continues to plan for heavy traffic down this dangerous street. DOGAMI has stated that the Landslides lining Hwy 213 did not re-activate until the State put the road in. Since Holly Ln and Hwy 213 share the same Landslides, if the City tries to widen Holly, will the slides re-activate again? Is Oregon City ready for these monetary losses because surely you cannot ask the people to bear financial losses directly caused by the City's decisions and actions.

11) I can't even fathom the amount of traffic the City is considering to put onto Holly Lane, I did a little math recently, and just counting the homes in Walnut Grove, Crabtree Terrace, Thayer Estates, the new homes on Thayer, in-fill in this area, these alone account for close to 1000 residences. If they could access Holly Ln, this would add about 10,000 whopping trips per day down this narrow, slide ridden street where hundreds of driveways directly access Holly Ln. Doesn't seem like good planning to me.

12) The City has been heavily developing, both in the Maplelane/Holly Ln area and on the Hilltop, but the City has been ignorant to providing ROADS and the necessary infrastructure to support this large build-out.

I say NO to this proposed development, this Urbanization should not go forward due to poor planning, lack of funding, lack of infrastructure, lack of studies into the huge Landslide problems along Hwy 213 and Holly Lane, and lack of communication from the City to the residents of the Holly Lane neighborhood. Oregon City has been all to willing to keep Holly Lane in its TSP, but remains unwilling to recognize the many serious life threatening issues that exist here.

From: Mary Johnson
To: Pete Walter
Subject: File Number SP 14-01
Date: Tuesday, October 28, 2014 1:10:53 PM

Dear Mr. Walter,

I am under the impression that you are the appropriate contact person in the Planning Department for the Limited Land Use Application SP 14-01. If you are not, please forward this email to the appropriate officer.

I visited in the office recently to determine what kind of sewer plan was going to be decided for the Beavercreek Apartment project. I had previously discussed this with other members of your staff and was told that 1) there is no sewer line running down Beavercreek Road between Marjorie Lane and Glen Oak Road, 2) Marjorie Lane would be the closest terminus for receiving sewer outflow from the proposed development, 3) connecting to Meyers Road would not be possible because the High School is on a private sewer system, 4) connecting through to Emerson Court would require crossing private land and 5) adding more sewer outflow to Glen Oak Road would overwhelm the current system because the existing pipe is too small and it would require a pump station.

Apparently, the developers will not give up on this idea, and have now submitted additional engineering studies that support their plan to add 421 gpm from Beavercreek Areas 1 and 2 into the Glen Oak system. My concerns are as follows:

1. If estimated remaining capacity of the Glen Oak/Highway 213 "conveyance" system is only 225 gpm, how can developers plan to add 421 gpm to that system? This is my understanding from reading the submitted file. I may be incorrect in my assumption.
2. Is this the reason Keller and Associates recommend that the manholes in Glen Oak Road be bolted down and "sealed" so that we don't have raw sewage leaking onto the roadway? That does not seem to be a good idea.
3. Infiltration and Inflow west along Glen Oak Road between Connie Court and Highway 213 has been managed to date by a series of catchment ponds. Are there any plans for the developers to provide such infrastructure to reduce I/I east along the remaining sections of Glen Oak and presumably Beavercreek Road as well?
4. How will the developers access the Glen Oak system since, from the map I have, they do not appear to own the land directly east of Glen Oak Road?

Even the engineering firms realize that "**the best *long-term* approach for servicing the entire Beavercreek service area appears to be a new sewer trunkline along S. Beavercreek Road.**" I concur.

At this point in time,due to the constraints of the existing sewer system in the area, it does not seem to be cost-effective to the company or healthy for our local community to approve this project.

Mary Johnson
19921 Beavercreek Road
Oregon City, OR 97045

October 27, 2014

Oregon City Planning Division

File # SP 14-01 Site Plan & Review

We are writing in regards to the proposed development for 19896 Beavercreek Rd. We attended the Evergreen Development meeting last summer and want to reiterate our concerns from the information provided last August.

We live across the street from the proposed apartments and are quite concerned about the considerable increase in traffic that will arise from the 183 planned units. Obviously a left turn lane will be needed at Myers, but will Beavercreek also be widened to accommodate these 200-400 more cars? Using Maple Lane as an example, that turn lane is often backed up 10-15 cars obstructing thru traffic on Beavercreek, but the two lanes help alleviate the congestion.

Our other main concern is the live-work units and their proposal of units fronting Beavercreek with on street parking. Again, we do not see A) how Beavercreek will be wide enough to accommodate on street parking and/or B) how cars will safely be able to pull out onto Beavercreek at the current posted speeds (and also slight uphill grade causing a blind spot). Also, will cars be allowed to park on both sides of Beavercreek? How much traffic will also spill onto Meyers for scrapbooking parties or a fitness class (these were suggested uses made by developer at previous meeting).

An additional parking concern is even though the developers claim they'll provide a parking space for each bedroom in the complex, where will guests, (customers?) or 2 car couples living in a 1 bedroom unit park?? Our property backs to Meyers and we are worried we will have even less privacy and increased noise with all these extra cars and no available parking for them in their own complex.

A final concern is the ability of the city to provide adequate water pressure to all these new residences when our current water pressure is already quite low. Will our water pressure decrease even further?

While development is inevitable, it would be much more appealing if single family homes could be built on this site. If this mixed use development must be permitted, we would hope the City would see fit to significantly reduce the number of units allowed (by half?) and require more parking/garages with no on street parking outside of the development.

Thank you for considering our concerns.

Ron & Wendy Carter
15035 Emerson Ct
Oregon City OR 97045

Ron & Wendy Carter
[redacted]
Oregon City, OR 97045

PORTLAND OR 970
28 OCT 2014 PM 3 L

Oregon City Planning
221 Molalla Ave
Oregon City, OR
97045

9704530719 9

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

LAND USE APPLICATION TRANSMITTAL

July 24, 2014

CITY STAFF DISTRIBUTION	*MAIL-OUT DISTRIBUTION*
❑ BUILDING OFFICIAL ✓	❑ NEIGHBORHOOD ASSOCIATION _Caufield ✓
❑ DEVELOPMENT SERVICES MANAGER ✓	❑ NATURAL RESOURCES COMM. (NRC)
❑ PUBLIC WORKS- OPERATIONS ✓	❑ CLACKAMAS COUNTY TRANSP. & PLANNING ✓
❑ CITY ENGINEER ✓	❑ CLACKAMAS FIRE DISTRICT #1 ✓
❑ PUBLIC WORKS DIRECTOR ✓	❑ ODOT – Division Review ✓
❑ TECHNICAL SERVICES (GIS) ✓	❑ OREGON CITY SCHOOL DISTRICT ✓
❑ PARKS MANAGER ✓	❑ TRI-MET ✓
❑ ADDRESSING	❑ METRO ✓
❑ POLICE ✓	❑ OREGON CITY POSTMASTER
TRAFFIC ENGINEER	❑ DLCD
❑ REPLINGER AND ASSOCIATES ✓	❑ CITY ATTORNEY ✓
	❑ OTHER: _____
Mailed Notice to County CPO's	
❑ Central Pt-New Era-Leland / Holcomb-Outlook/Beavercreek ✓	
Mailed Notice	
❑ Within 300' ✓	

PUBLIC COMMENTS DUE:	6:00 p.m., August 11, 2014
REVIEW COMMENTS DUE:	6:00 PM, August 25, 2014
HEARING DATE:	Type II – Not applicable
HEARING BODY:	_XX__**Staff Review;** _____PC; _____CC
FILE # & TYPE:	SP 14-01: Site Plan and Design Review for a 121-unit Apartments and 62 Live-Work Units on 9.7 acres (Zoned MUC-1) – East side of Beavercreek Road
PLANNER:	Pete Walter, AICP, Planner (503) 496-1568
PROJECT WEBSITE:	http://www.orcity.org/planning/landusecase/sp-14-01-beavercreek-road-apartments-live-work-units
APPLICANT:	Beavercreek Road, LLC, Attn: Andrew Brand
LOCATION:	19896 Beavercreek Rd, Oregon City OR 97045 (See Vicinity Map on Public Notice) Clackamas County Map 3-2E-10C Tax Lot 800

This application material is referred to you for your information, study and official comments. If hard copies are required, please contact the Planning Department. Your recommendations and suggestions will be used to guide the Planning staff when reviewing this proposal. If you wish to have your comments considered and incorporated into the staff report, please return the attached copy of this form to facilitate the processing of this application and ensure prompt consideration of your recommendations.

Please check the appropriate spaces below. Attach additional pages if needed.

_____ The proposal does not conflict with our interests.

_____ The proposal conflicts with our interests for the reasons stated below.

__X__ The proposal would not conflict our interests if the changes noted below are included.

See attached CRW comments

Signed Betty Lefton

Title Engineering associates

PLEASE RETURN YOUR COPY OF THE APPLICATION AND MATERIAL WITH THIS FORM.

Clackamas River Water

Date:	August 22, 2014	**SENT VIA EMAIL**
To:	Pete Walter, Planner City of Oregon City	
From:	Betty Johnson, Engineering Associate Clackamas River Water	
Subject:	Land Use Application:	**File** #SP 14-01
Applicant:	Beavercreek Road, LLC Andrew Brand 600 University Street, Suite 1708 Seattle, WA 98101	
Site Address:	19896 Beavercreek Rd, Oregon City, OR 97045	
Legal Description:	32E10C 00800	

CRW Comments:

This property was withdrawn from the Clackamas River Water (CRW) service boundary and annexation completed in 2008 per Ordinance: 07-1021. The property is within the City's Beavercreek Concept planning area but due to low water pressure has elected not to allow City water service to the property. Beavercreek Road, LLC has contacted CRW inquiring if the District would be able to provide water service for the development. A preliminary hydraulic model indicates that the District's Beavercreek Pressure Zone has the capability to provide both volume and pressure.

The attached CRW letter to Evergreen Housing Development Group outlines the District's minimum requirements as summarized below:

- Per Section 9 of the CRW's Rules and Regulations *Service Outside District* the applicant must seek approval from the CRW Board of Commissioners to provide water service to this exterritorial development.
- Be prepared to comply with an Intergovernmental Agreement between the City and CRW, allowing the district to provide water to the property described and other requirements to be determined.
- Evergreen Housing Development shall sign a "Developer's Agreement" `with CRW.

- Evergreen Housing Development shall be responsible for all costs associated with the design and construction of a waterline and metering vault assembly including hydraulic modeling efforts by CRW, project review and inspection.
- The waterline, once constructed and accepted, will be donated to the City to maintain and operate.
- The master meter and vault assembly serving the development will be donated to CRW to maintain and operate.

On August 18, 2014, Beavercreek Road LLC provided a written request to CRW to provide water service to the referenced property (see attached letter). Based on this request CRW staff is preparing an agenda item for the CRW Board of Commissioners to consider providing water service to this exterritorial property.

CRW requests direction from the City to determine if CRW will be allowed to provide water service to the referenced property, with the understanding that agreements will meet both the City and CRW requirements.

For further information regarding these comments please contact Bob George, 503-722-9228.

Clackamas River Water

P.O. Box 2439
Clackamas, Oregon 97015-2439

(503) 722-9220
Fax (503) 656-7086

16770 SE 82nd Drive, Clackamas
customerservice@crwater.com

June 10, 2014

Andrew Brand
Evergreen Housing Development Group, LLC
600 University Street, Suite 1708
Seattle, WA 98101

Subject: Water Service for 19896 Beavercreek Rd. – REF: SP 14-01 / PA-13-24

Mr. Brand,

Based on documentation from Oregon City and Evergreen Housing Development Group, the current development plan has the site to be developed with 121 rental apartments and 62 live-work units. Due to low available water pressure the City has determined that the site cannot be served from the existing City's 16-inch water main (590HGL) that fronts the property. Multiple solutions utilizing the main have been offered by Evergreen Housing Development (Developer) to the City, but none have met the City requirements.

Per our conversations, you have shown an interest working with CRW in development of a water main from CRW's Beavercreek Pressure Zone to the development site. CRW's Beavercreek Pressure Zone (744HGL – high level) is located approximately 850 feet south of the site along Beavercreek Road. A review of the property indicates that it is within the City's limits and outside the Clackamas River Water (CRW) district's service boundary. Also our preliminary review indicates that pressure and volume from this pressure zone could meet the City's requirement.

For CRW to consider this option, you will be required as a minimum be prepared to comply to or complete the following items.

- Be prepared to comply with an Intergovernmental Agreement between the City and CRW, allowing the district to provide water to the property described and other requirements to be determined.
- The CRW Board will need to provide a Resolution allowing water to be provided exterritorialy.
- Evergreen Housing Development shall be responsible for all costs associated with the design and construction of a waterline and metering assembly sized to meter domestic water requirements. This would include hydraulic modeling efforts by CRW, project review and inspection.

- The waterline once constructed and accepted would be donated to the City to be maintained and operated.
- The master meter and vault assembly would be donated to CRW to be maintained and operated.
- Evergreen Housing Development shall sign a "Developer's Agreement "with CRW.

In conclusion, CRW is willing to work with Evergreen Housing Development on the development of a water system that would provide domestic water from the Beavercreek Pressure Zone to the referenced site. If you have any additional questions or comments please do not hesitate to call (503-722-9228).

Respectfully,

Robert C. George

Robert C. George, P.E.
District Engineering, Clackamas River Water

CC: CRW Chron file
Engineering files – Evergreen Housing (3-ring file)

Beavercreek Road LLC
600 University St, Suite 1708
Seattle, WA 98101
206-535-6348

August 18, 2014

Bob George
Clackamas River Water District
16770 SE 82nd Dr. #100
Clackamas, OR 97015

RE: Request for Water Service at 19896 Beavercreek Road, Oregon City, OR

Bob,

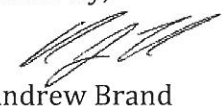
I am writing today as the representative for Beavercreek Road LLC, the owner of an approximately 11 acre parcel of land at 19896 Beavercreek Road in Oregon City and land use applicant to develop approximately 186 units of multi-family rental housing on this same site.

It has come to our attention that the City of Oregon City may have difficulty providing adequate water service to meet the needs of our proposed development both for residential domestic water and possibly for fire services. Before our parcel was annexed to Oregon City it was under the jurisdiction of CRW. As such, it still has an abandoned water line running to it from the CRW pump station on Beavercreek Road.

I am writing to formally ask for exterritorial water service from CRW to supply our project. I would appreciate having a formal decision from the CRW board as soon as possible stating CRW's willingness to provide water services to our project.

I appreciate your time on this matter. Please let me know if I can clarify any questions you may have about our proposed project or this request for exterritorial service.

Sincerely,



Andrew Brand
Authorized Representative
Beavercreek Road LLC
andrew@evergreenhd.com

Clackamas County Fire District #1
Fire Prevention Office

To: **Pete Walter, Oregon City Planning**

From: **Mike Boumann, Deputy Fire Marshal**, Clackamas County Fire District #1

Date: **11/10/2014**

Re: **180-Unit Apartment & Townhome Development, 19896 Beavercreek Road**

This review is based upon the current version of the Oregon Fire Code (OFC), as adopted by the Oregon State Fire Marshal's Office. The scope of review is typically limited to fire apparatus access and water supply, although the applicant must comply with all applicable OFC requirements. ***The following items should be addressed by the applicant and shown on the fire and life safety plans:***

FD Apparatus Access

1) Fire apparatus access roads shall be within 150 feet of all portions of the exterior wall of the first story of the building as measured by an approved route around the exterior of the building.
2) Per section D106.1 of the Oregon Fire Code, secondary access is required for projects having more than 100 dwelling units. It appears sprinklers are being planned for the apartments but please address this requirement as the design does not appear to meet the exception at this time.
3) Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet (26 feet adjacent to fire hydrants) and an unobstructed vertical clearance of not less than 13 feet 6 inches.
4) Where fire apparatus roadways are not of sufficient width to accommodate parked vehicles and 20 feet of unobstructed driving surface, "No Parking Fire Lane" signs shall be installed on one or both sides of the roadway where needed. Painted curbs considered as an alternate.
5) Turning radii for curves and turnarounds shall be not less than 28 feet and 48 feet respectively, measured from the same center point. Appears to be met based on sheet C4.

Water Supply

1) All new buildings shall have a firefighting water supply that meets the fire flow requirements of Appendix B of the 2010 Oregon Fire Code. Estimated required fire flow for largest fire area is 5,000 gpm @20 psi. 75% reduction allowed with fire sprinklers installed but in no case shall the resulting fire flow be less than 1,500 gpm @ 20 psi residual.
2) Fire hydrant and FDC locations for current sprinklered buildings approved as shown on C7.
3) Following completion of construction activities please provide CFD#1 with an as-built PDF showing the following: Fire apparatus access, fire lanes, fire hydrants, fire lines, available fire flow, fdc locations if applicable, building square footage and type of construction.

2930 S.E. Oak Grove Blvd. • Milwaukie, OR 97267 • 503-742-2660

MEMORANDUM

TO: Pete Walter, City of Oregon City, Planning Division
FROM: Kenneth Kent, Clackamas County, Land Use Review Coordinator
DATE: November 4, 2014
RE: SP 14-01 Live/work
3-2E-10C TL 800

This office has the following comments pertaining to this proposal:

FACTS AND FINDINGS

1. The proposed land use application for 173 dwelling units, consisting of 121 apartment units and 62 live-work units on a 9.7 acre property located within the City of Oregon City. The project site abuts Beavercreek Road which is under the jurisdiction of Clackamas County. These comments address improvements as they relate to the Beavercreek Road frontage of the project site.

2. Generally, where the City's road cross-section exceeds the county's minimum standard, the County will defer to the City section. However, certain design standards relating to storm drainage, access spacing, geometric design, parking or specific construction details may not allow implementation of the full City standard.

3. The proposed development has approximately 1,015 feet of frontage on the easterly side of Beavercreek Road. Clackamas County has designated Beavercreek Road a major arterial roadway. Clackamas County has adopted roadway standards that pertain to the structural section, right-of-way width, construction characteristics, and access standards for arterial roadways. Developments adjacent to existing roadways are required to improve the roadway to current standards.

4. *Clackamas County's Roadway Standards* indicate that major arterial roadways shall have a right-of-way width that ranges from 60 to 134 feet, depending on the planned road section. The standard urban major arterial roadway 3-lane section calls for a 50-foot wide curb to curb width, typically requiring 80 feet of right-of-way. The applicant will be required to dedicate approximately 10 feet of additional right-of-way to provide a 40-foot one-half right-of-way width. Minimum improvements on the Beavercreek Road frontage consistent with *Clackamas County's Roadway Standards* include, but are not limited to, up to a 25-foot wide half-street improvement, pavement widening, curb, 5-foot wide landscape strip and 7-foot wide sidewalk.

5. The new easterly leg of Meyers Road is proposed with a 79.5 degree angle to Beavercreek Road. Section 250.8.2 of the Clackamas County Roadway Standards states that intersections should be kept as near to 90 degrees as possible. Although the standards specify that the angle can vary from 90 degrees to 80 degrees, it is dependent on the roadway, as determined by the Engineering Division. For a signalized

intersection on a high volume major arterial road, 79.5 degrees in not appropriate. The tangent of the Meyers intersection needs to be as near to 90 degrees as possible for a minimum of 75 feet.

6. The preliminary plans propose parking on Beavercreek Road. Although, parking can be considered on a major arterial, the design, volume and characteristics of the roadway are factors in the decision. Given the high volume and speed of the roadway, Clackamas County Engineering has determined that parking is not appropriate for this portion of Beavercreek Road.

7. There is an existing school speed zone of 20 MPH 7 AM – 5 PM along Beavercreek Road adjacent to the site. As currently posted, this school zone is the source of much frustration for many. School zones along major arterials are required by the County Roadway Standards to be installed with school zone flashers, which would limit the hours of school speed 20. Based on the increased traffic generated by the proposed development, it is recommended that the applicant provide funds to construct school zone flashers.

8. The proposed subdivision will create a new public road intersection with Beavercreek Road. Intersections with a county road are required to meet minimum intersection sight distance, per Section 240 of the Clackamas County Roadway Standards. Beavercreek Road has a posted speed of 40 miles per hour. The design speed for purposes of determining sight distance is based on the posted speed plus 5 miles per hour. For a speed of 45 miles per hours, a minimum of 500 feet of intersection sight distance is required. It appears that at the point of intersection with Beavercreek Road sight distance of 500 feet can meet. The applicant will be required to demonstrate site lines in compliance with minimum intersection sight distance as part of the Development Permit.

9. The following are review comments regarding the traffic impact study*:*

    a. Several of the intersections are referred to as City intersections, but are actually under the jurisdiction of Clackamas County. The intersections include Beavercreek/Maplelane, Maplelane/Thayer, Beavercreek/Loder, Beavercreek/Meyers, Beavercreek/Glen Oak, and Beavercreek/Clairmont.

    b. The trip generation seems a little off as there isn't consideration beyond the trip generation of residential units for the live/work units, but this is not anticipated to change the outcome of the study.

    c. The trip distribution seems a little off as the majority of traffic is illustrated as travelling to/from the south while the trip percentages illustrate traffic travelling mostly to/from the north, but this is not anticipated to change the outcome of the study.

    d. The traffic analysis illustrates a southbound left turn into the site with permissive phasing, while the existing northbound phasing is protected/permissive. The County would actually operate both movements with protected/permissive phasing. However, this would not affect the outcome of the study.

10. Clackamas County standards limit access to minor arterial roadways. Individual driveway access is typically not permitted on an arterial when alternatives are available. Access is generally required from a road with a lower functional classification. The

proposed plan is consistent with this standard. No direct vehicular access to the Beavercreek road frontage will be permitted to the project site.

11. Prior to commencement of site work, a Development Permit and a Utility Placement Permit are required and must be obtained from Clackamas County for all work performed in the Beavercreek Road right-of-way.

CONCLUSION

Although the County does not have land use jurisdiction over the proposed subdivision, the County does have jurisdiction over improvements along and access to Beavercreek Road. However, the following recommended conditions reflect the County's minimum standards. Where Oregon City's standards are greater, and do not otherwise conflict with the County's storm drainage standards and maintenance practices.

If the City of Oregon City approves the request, the following conditions of approval are recommended. If the applicant is advised to or chooses to modify the proposal in terms of access location and/or design following the preparation of these comments this office requests an opportunity to review and comment on such changes prior to a decision being made.

1. All frontage improvements in, or adjacent to Clackamas County right-of-way, shall be in compliance with *Clackamas County Roadway Standards*.
2. The applicant shall dedicate approximately 10 feet of additional right-of-way on Beavercreek Road and shall verify by survey that a 40-foot wide, one-half right-of-way width exists along the entire site frontage, or shall dedicate additional right-of-way as necessary to provide the minimum width.
3. The applicant shall design and construct improvements along the entire site frontage of Beavercreek Road in accordance with *Clackamas County Roadway Standards,* as modified to reflect the Oregon City street section.

   These improvements shall consist of:

   a. Up to a half-street improvement. Structural section for Beavercreek Road improvements shall consist of 7.5 inches of asphalt concrete per Clackamas County Roadway Standards Standard Drawing C100.

   b. Standard curb, or curb and gutter if curbline slope is less than one percent, and pavement with the face of the new curb located a minimum of 37 feet from the centerline of right-of-way. Centerline of the right-of-way shall be established by a registered survey.

   c. A minimum 7-foot wide unobstructed setback sidewalk, with a 5-foot landscape strip shall be constructed along the entire site frontage. The applicant shall relocate mailboxes, fire hydrants, utility poles, etc., when they are located within the limits of the sidewalk or construct an eyebrow so that the full width of the sidewalk is provided around the obstruction. Additional easement, as necessary, shall be granted to provide for any sidewalk eyebrows.

   d. If the sidewalk does not connect to sidewalk on adjacent property, the end of the sidewalk shall require the construction of a temporary asphalt ramp, adjacent to

the end of the sidewalk, providing a transition from the new sidewalk to the edge of the pavement. The ramp shall meet ADA guidelines and shall be a minimum of two inches in thickness.

e. Appropriate pavement tapers shall be provided, per Clackamas County Roadway Standards Section 250.6.4.

f. Drainage facilities in conformance Tri-City Service District #4 regulations and Clackamas Roadway Standards, Chapter 4.

g. The proposed Beavercreek cross-section shall be modified to eliminate parking. No on-street parking shall be permitted along the Beavercreek Road site frontage.

4. The intersection of the new portion of Meyers Road shall intersect Beavercreek Road at a 90 degree angle and shall include a tangent section of at least 75 feet from the curb, per Section 250 of the Roadway Standards.

5. A signal modification for the Beavercreek/Meyers signal shall be approved by Clackamas County Traffic Engineering, including signal pole locations, lane configuration, signal detection and signal phasing. The applicant shall also provide queuing estimates for the Beavercreek/Meyers intersection prior to the approval of the improvement plans.

6. The applicant shall provide funds to construct school zone flashers on Beavercreek Road to replace the existing school speed zone signs in the vicinity of the project site.

7. The applicant shall provide minimum intersection sight distance at the intersection of the new Meyers Road intersection with Beavercreek Road. In addition, no plantings at maturity, retaining walls, embankments, fences or any other objects shall be allowed to obstruct vehicular sight distance. Minimum sight distance is 500 feet in each direction. Sight distance shall be measured from a point 14.5 feet back from the edge of the travel lane at a driver's eye height in the driveway of 3.5 feet to a vehicle height of 3.5 feet in the oncoming travel lanes. The applicant shall demonstrate sight lines and compliance with minimum intersection sight distance as part of the Development Permit for the project.

8. Any surface water runoff from the site to the Beavercreek Road right-of-way shall be detained outside of the right-of-way in conformance with *Clackamas Roadway Standards*. Any surface water runoff discharged to the Beavercreek Road right-of-way will only be allowed if it can be shown that the existing system has the capacity to accept the runoff and no adverse downstream impacts will be created.

9. The applicant shall submit an Engineer's cost estimate to be approved by Clackamas County Engineering for the asphalt concrete, aggregates, and any other required public improvement in the Beavercreek Road right-of-way.

10. Prior to commencement of site work the applicant shall obtain a Development Permit from this office for design and construction of required improvements to Beavercreek Road. To obtain the Permit, the applicant shall submit plans prepared and stamped by an Engineer registered in the State of Oregon, provide a Performance Guarantee, and pay an Inspection Fee. The Performance Guarantee is 125% of the approved Engineer's cost estimate for the required improvements.

11. Prior to commencement of utility work within the Beavercreek Road right-of-way a Utility Placement Permit shall be obtained from this office.

12. Prior to commencement of any work, including grading, and prior to issuance of the Development and Utility Placement permits, the contractor shall:

    Provide a traffic control plan for review and approval from Clackamas County's Engineering Office. Provide a certificate of liability insurance, naming the County as additionally insured. Obtain separate "Street Opening Permits" for utility installations within the County right-of-way. The applicant shall obtain these permits from the Engineering office prior to the issuance of the Development Permit.

Oregon
John A. Kitzhaber, MD, Governor

Department of Transportation
Region 1 Headquarters
123 NE Flanders Street
Portland, Oregon 97209
(503) 731.8200
FAX (503) 731.8259

11/6/2014

City of Oregon City
221 Molalla Ave, Suite 200
Oregon City, OR 97045

ODOT Case No: 5274

Subject: SP 14-01: Beavercreek Live/Work (Marquee Mixed Use Apts)
OR 213 and Meyers Rd

Attn: Pete Walter, Planner

We have reviewed the applicant's proposal for 183-unit apartment - live/work units. The site is in the vicinity of OR 213. ODOT has permitting authority for this facility. According to the 1999 Oregon Highway Plan (OHP), this facility is classified a District highway and the performance standard is 0.99 volume to capacity (v/c) ratio.

ODOT recommends that the City require the applicant to "contribute a proportional share of funding for the construction of the westbound right turn lane at the OR 213/Meyers Rd intersection" as conditioned in the zone change decision dated November 9, 2010. Thank you for providing ODOT the opportunity to participate in this land use review. If you have any questions regarding this matter, please contact me at 503.731.8234.

Sincerely,

Seth Brumley

Seth Brumley
Development Review Planner

C: Avi Tayar, P.E., ODOT Region 1 Traffic

From: O"Connell, Grant
To: Pete Walter
Cc: Kautz, Steve; Baldwin, Ben
Subject: RE: Beavercreek Road Live-Work / Apartments Comments? (SP 14-01)
Date: Monday, November 03, 2014 3:49:08 PM
Attachments: image001.png
image003.png

Hi Pete,

We did review the plans for the project. This project, correct? I also shared them with Steve Kautz, the Service Development Manager and coordinator of the Southeast Service Enhancement Plan. We have no firm plans to run service along this road so to comment regarding specific bus stop plans seems inappropriate. However, we welcome the visionary approach you take, as always, to development in Oregon City.

Grant O'Connell

Planner II · Operating Projects · 1800 SW First Avenue, Suite 300 · Portland, OR 97201
o'connelg@trimet.org · **T** 503-962-6478
TRIMET
See where it takes you.

From: Pete Walter [mailto:pwalter@ci.oregon-city.or.us]
Sent: Thursday, October 30, 2014 3:27 PM
To: Baldwin, Ben; Boll, Heather; O'Connell, Grant
Subject: Beavercreek Road Live-Work / Apartments Comments? (SP 14-01)

Hi guys,

I sent out a transmittal for comment (by email) a couple of weeks back for a 180 unit apartment '/ live work unit complex on Beavercreek Road across from Oregon City High School which I am reviewing for compliance with our Site Plan criteria, as well as our Transit Corridor requirements. I know this is not currently a Tri-Met Route, but thought I'd send you a tickler in any event.

Let me know if I need to resend the transmittal, or if you have any concerns or not. Seems like a good spot for a bus-stop.

Thanks,

Pete Walter

Pete Walter, AICP, Associate 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

REPLINGER & ASSOCIATES LLC
TRANSPORTATION ENGINEERING

November 12, 2014

Mr. Pete Walter
City of Oregon City
PO Box 3040
Oregon City, OR 97045

SUBJECT: REVIEW OF TRANSPORTATION IMPACT ANALYSIS – BEAVERCREEK MIXED-USE DEVELOPMENT – SP14-01

Dear Mr. Walter:

In response to your request, I have reviewed the Traffic Impact Analysis (TIA) in support of the proposed of the proposed mixed-use development adjacent to Beavercreek Road. The TIA was prepared by Chris Brehmer, PE of Kittelson & Associates, Inc. The TIA is dated December 13, 2013.

The TIA describes a proposal to construct 183 residential units of which 36 are proposed to be live-work townhomes. The 9.73-acre site is adjacent to Beavercreek Road in the vicinity of Meyers Road. The TIA assumes the site will be built out by 2016.

Overall

I find the TIA addresses the city's requirements and provides an adequate basis to evaluate impacts of the proposed development.

Comments

1. ***Study Area.*** The study addresses the appropriate intersections. It includes an analysis of the following intersections:

    - Highway 213/Beavercreek Road
    - Highway 213/Molalla Avenue
    - Highway 213/Meyers Road
    - Highway 213/Glen Oak Road
    - Thayer Road/Maplelane Road
    - Beavercreek Road/Maplelane Road
    - Beavercreek Road/Clairmont Drive
    - Beavercreek Road/Loder Road
    - Beavercreek Road/Meyers Road

- Beavercreek Road/Glen Oak Road

These intersections are appropriate for the purposes of assessing the impact of the development.

2. ***Traffic Counts.*** The traffic counts were conducted in October 2013 during the AM and PM peak periods. The counts appear reasonable. Traffic counts for intersections along Highway 213 were adjusted to account for seasonal differences in accordance with ODOT's *Analysis Procedures Manual*.

3. ***Trip Generation.*** The TIA provides trip generation information from the Institute of Transportation Engineers' *Trip Generation.* The engineer uses 147 units of Mid-Rise Apartments (ITE Land Use Category 223) and 36 Rental Townhouses (ITE Category 224) He calculates trip generation for the proposed development to be 69 AM peak hour trips; 83 PM peak hour trips; and 810 total weekday trips.

   I think the engineer should have used a different category from *Trip Generation* that also describes the development but which is based on larger number of studies. I have revised the trip generation estimates using Apartments (ITE Category 220). Using this category, the trip generation estimates are approximately 50 percent higher. Using category 220 the calculated trip generation is 100 AM peak hour trips; 127 PM peak hour trips; and 1248 weekday trips. I do not think the effect would be significant in the operations at any intersection.

4. ***Trip Distribution.*** According to the engineer, the trip distribution is based a review of the current transportation network, existing turning movements and the nature of the development. The regional trip distribution pattern seems reasonable. The engineer's assumption about trips in the immediate vicinity of the site indicates approximately the same volume of traffic using Glen Oak Road to connect with Highway 213 as using Beavercreek Road. Overall, the trip distribution patterns appear reasonable and modest changes to the assumptions would have little practical effect on the analysis.

5. ***Traffic Growth.*** The TIA uses a one percent annual growth rate for traffic through 2016. For the intersection of Highway 213 and Meyers Road, an intersection previously identified as an issue, a supplemental analysis using year 2027 as the horizon year was conducted. Traffic volumes for this intersection for 2027 were developed based on previous analyses and on the values from the regional transportation model and consultation with ODOT and the City.

6. ***Analysis.*** Traffic operations analysis was conducted for the AM and PM peak hours for 2013 existing conditions; 2016 background conditions; and 2016 total conditions with the proposed development.

In year 2016, the analysis indicates that the intersection of Highway 213 and Beavercreek Road is calculated to operate at a volume-to-capacity ratio (v/c) of 1.0 in the AM peak hour and a v/c of 0.81 in the PM peak hour. Under OCMC 12.04.205 D, this intersection is exempt from the normal mobility standard of 0.99, but 12.04.205 D 2 states:

> *Development which does not comply with the mobility standards for the intersections identified in 12.04.205.D shall provide for the improvements identified in the Transportation System Plan (TSP) in an effort to improve intersection mobility as necessary to offset the impact caused by development. Where required by other provisions of the Code, the applicant shall provide a traffic impact study that includes an assessment of the development's impact on the intersections identified in this exemption and shall construct the intersection improvements listed in the TSP or required by the Code.*

The TIA predicts that 21 vehicles from the development will traverse the Highway 213/Beavercreek Road intersection during the AM peak hour and 25 will traverse it during the PM peak hour. Using my revised trip generation calculations described in #3, above, the intersection would be traversed by 30 vehicles during the AM peak hour and 38 during the PM peak hour. Based on OCMC 12.04.205 D 2, the applicant may be required to implement improvements listed in the TSP to mitigate for this traffic impact.

For the nine other intersections in the study area, the TIA predicts that, even with the development, the v/c is predicted to be less than 0.99 in 2016. All intersections are predicted to meet the city's operational standard. The TIA notes that at the intersection of Loder Road and Beavercreek Road, the minor street approach will operate at level of service (LOS) F during the AM peak hour. However, under the new city mobility standard, there "is no performance standard for the minor street approaches" at unsignalized intersections.

In addition, an analysis was conducted of the Highway 213/Meyers Road intersection for year 2027 with assumed completion of the extension of Meyers Road between Highway 213 and Beavercreek Road, a project included in the adopted Transportation System Plan. The analysis of this intersection also included a sensitivity analysis to determine how an increase in the number of dwelling units at the site would impact the year 2027 traffic operations.

At the Highway 213/Meyers Road intersection, the predicted 2027 v/c is 1.13 under background conditions. With the development, the v/c is expected to deteriorate to 1.14 during the PM peak hour. In the 2010 study, this was determined to be less than a "significant impact" under ODOT's definitions. However, in 2017, the intersection was predicted to fail to meet city and ODOT operational standards. To mitigate for the failure to achieve operational standards, one of the conditions specified in the rezoning

completed during 2010 was participation in the construction of intersection improvements.

In the 2010 study, the engineer's indicated that the addition of an exclusive right-turn lane on westbound Meyers Road at Highway 213 improves the operations of the intersection such that its performance in the "with rezoning" scenario would be better than the 2017 scenario without the rezoning. The engineer also calculated that the addition of a northbound through lane on Highway 213 allows either 2017 scenario to meet ODOT's mobility standards.

Using my revised trip generation calculations and the engineer's trip distribution patterns, the proposed right turn lane from Meyers Road to OR 213 northbound would be used by 14 vehicles from the development during the PM peak hour. This would represent approximately 14 percent of the predicted right-turning traffic at this location.

7. ***Turn Lanes.*** TIA specified that westbound approach of Meyers Road at Beavercreek Road would utilize a left-turn lane and a through-right lane. He further explained that the configuration of Meyers Road would consist of a three-lane cross-section consistent with the Beavercreek Concept Plan and TSP. The configuration satisfies the need to analyze turn lanes at the site.

8. ***Crash Information.*** The TIA provided a five-year crash history for the intersections in the study area. The only intersection approaching a crash rate of 1.0 crashes per million entering vehicles is the intersection of Highway 213 and Beavercreek Road. All other intersections have experienced a much lower crash rate and no particular patterns were evident. There is no indication that the proposed development will have a disproportional impact on safety at any of the intersections.

9. ***Pedestrian and Bicycle Facilities.*** The conceptual sight plan appears to provide appropriate facilities for pedestrians and bicyclists in the development. The provision of bicycle facilities along the frontage should be verified in connection the review of detailed plans for frontage improvements.

10. ***Site Plan and Access.*** The TIA and conceptual sight plan indicate Meyers Road will be extended east of Beavercreek Road through his site consistent with adopted plans. The conceptual site plan indicates local streets will be extended to the property boundaries allowing further extension when adjoining properties are developed. The alignment proposed for Meyers Road at Beavercreek Road calls for an angle of intersection of approximately 80 degrees, rather than the ideal angle of 90 degrees. I consider the 80-degree angle of intersection to be completely acceptable for this location because it is signalized intersection. For an unsignalized intersection, I would be more concerned because of the potential impact on sight distance. For signalized intersections, this is not a significant concern.

11. ***Intersection Spacing.*** Intersection spacing along Meyers Road to the east of Beavercreek Road appears appropriate given the configuration of the parcel and the opportunities for further connections with adjoining parcels.

12. ***Sight Distance.*** The TIA indicates that sight distance at the Meyers Road/Beavercreek Road intersection was estimated to be in excess of 450 feet to the north and approximately 650 feet to the south. Sight distance is adequate for this signalized intersection.

13. ***Consistency with the TSP.*** The planned extension of Meyers Road east of Beavercreek Road is consistent with the TSP and Beavercreek Road Concept Plan. A detailed review of proposed frontage improvements should be conducted to verify consistency with the TSP and city code requirements.

14. ***Conclusions and Recommendations.*** The engineer concludes that the all study area intersections will meet mobility standards in 2016 even with the build out of the development. In fact, the v/c for the Highway 213/Beavercreek Road is predicted to be 1.0, rather than 0.99. However, under OCMC 12.04.205 D, the normal mobility standards to not apply at this intersection.

    Because of the conditions associated with rezoning of the parcel in 2010, the TIA also includes a discussion for the Highway 213/Meyers Road intersection. In the 2010 study it was shown that the inclusion of an exclusive right-turn lane on the westbound approach of Meyers Road at Highway 213 improves the intersection's performance to better than that predicted for the "no rezoning" scenario. This became a condition of approval associated with the rezoning of the property.

Conclusion and Recommendations

I find the TIA meets city requirements. The TIA indicates that development will cause modest increases in traffic. With the exception of Highway 213/Beavercreek Road, mobility standards will be met at all locations with the development in year 2016.

The applicant's access to the transportation system will be accomplished by constructing the extension of Meyers Road to the east of Beavercreek Road. Materials provided by the applicant appear consistent with the planned function of Meyers Road. The extension of Meyers Road will require the applicant reconstruct the existing intersection and signal system to accommodate the new east leg of the intersection. The conditions of approval should specify that the applicant bear the costs of designing and reconstructing the intersection and the existing signal to provide for all movements including left-turn lanes and protected phasing for left turns on each approach. The signal system upgrade should comply with county standards.

Because of special provisions in OCMC 12.04.205 D, the intersection of Highway 213 and Beavercreek Road is allowed to exceed v/c 0.99. Under 12.04.205 D 2, the applicant may be required to construct TSP improvements or other improvements specified by the Code to offset the impacts at this intersection. (See #6, above.) I recommend that the City Engineer and planning staff identify improvements from the TSP that could be implemented by the applicant to offset the impacts caused by the development at this intersection. I further recommend that implementation of the specified improvements be added as a condition of development for this proposal.

In connection with the rezoning of the property in 2010, an analysis was also conducted of the Highway 213/Meyers Road intersection. I recommend that the conditions of approval related to this intersection prescribed during the rezoning (ZC10-01) be retained and restated as conditions of approval for this development proposal. Based on the information supplied in the TIA and supplemented by my revised trip generation calculations, I conclude that the development's contribution to the right-turn movements from Meyers Road to northbound OR 213 will be approximately 14 percent. This is a reasonable minimum as the required contribution by the developer for improving the operations of this intersection.

If you have any questions or need any further information concerning this review, please contact me at replinger-associates@comcast.net.

Sincerely,

John Replinger, PE
Principal

Oregon City\2014\SP14-01v3.docx

OREGON CITY

Public Works

625 Center Street | Oregon City OR 97045
Ph (503) 657-0891 | Fax (503) 657-7892

FILE MEMORANDUM

SUBJECT:	Public Works Engineering SP 14-01 Staff Report Findings and Conditions for Sanitary Sewer and Water Service for Beavercreek Rd Apartments/Live-Work Development
BY:	Aleta Froman-Goodrich, P.E., City Engineer
DATE:	November 5, 2014
PLANNING FILE:	SP 14-01: Site Plan and Design Review

Background:
The staff report for the Type II Limited Land Use Action for SP 14-01 Beavercreek Rd Apartment/Live-Work development is being prepared. This file memorandum provides further details about the Public Works Engineering findings, responses and conditions for the public sanitary sewer and water systems to serve the proposed development. The proposed development, Beavercreek Rd Apartments/Live Work (Beavercreek Rd Apts), is a 121-unit apartments and 62 live-work units on 9.7 acres with MUC-1 zoning located along the eastern side of Beavercreek Road across from the intersection of Meyers Road and Beavercreek Road. The developer is Evergreen Housing Development Group, LLC. The application completeness date was July 11, 2014.

Sanitary Sewer Service:

1. City's 2003 Sanitary Sewer Master Plan (SSMP)
   Findings:
   a. On July 11, 2014, application completeness date, the 2003 SSMP was the City's adopted master planning document for the sanitary sewer collection system standards, improvement requirements, and capacity evaluation.
   b. The 2003 SSMP included evaluation of the existing sanitary sewer collection system to convey flows under existing and future buildout conditions.
      i. Evaluation included collection systems in the Glen Oak and Beavercreek basins.
      ii. The Glen Oak basin conveys flows directly to the City's Highway 213 trunk sewers.
      iii. The Hwy 213 trunk sewers were not evaluated. As a result there is no information about capacity within the Hwy 213 collection system in the 2003 SSMP.
   c. Per the 2003 SSMP, the Beavercreek Road Concept Plan (BRCP) area located north of Glen Oak Rd is planned to be served by the Beavercreek Rd basin from a future sanitary sewer main extension in Beavercreek Rd starting just south of Marjorie Lane to the development.
   d. Beavercreek Rd Apts development is located along Beavercreek Rd north of Glen Oak Rd and within the BRCP area. Per 2003 SSMP, the property is planned to be served by the Beavercreek basin.
      i. 2003 SSMP does not evaluate flows from Beavercreek Rd Apts to be conveyed to the Glen Oak basin.
      ii. 2003 SSMP does evaluate future build-out flows including Beavercreek Rd Apts to be conveyed to the Beavercreek Rd basin.

e. 2003 SSMP identified deficiencies in Glen Oak Rd basin when evaluating the conveyance system for build-out flow conditions, improvements were recommended, and the improvements were constructed and placed into operation.

2. City's 2014 Sanitary Sewer Master Plan (SSMP)
   Findings:
   a. The City Commission adopted the City's 2014 Sanitary Sewer Master Plan (SSMP) on October 1, 2014.
   b. On July 11, 2014, application completeness date, the 2014 SSMP was in the process of being adopted as the City's master planning document for the sanitary sewer collection system standards, improvement requirements, and capacity evaluation.
   c. The 2014 SSMP updates the 2003 SSMP with a current assessment of the City's sanitary sewer collection system to convey existing and future buildout flows, including an evaluation of the Hwy 213 trunk sewers located downstream of the Glen Oak basin.
   d. The 2014 SSMP provides constructive evidence in determining the adequacy of the sanitary sewer service to Beavercreek Rd Apts, including requirements that may apply in order to meet City standards.
   e. The 2014 SSMP included evaluations of the collection systems in the Glen Oak and Beavercreek basins and the downstream Hwy 213 trunk sewers.
      i. The Glen Oak basin conveys flows directly to the City's Highway 213 trunk sewers.
      ii. The Hwy 213 trunk sewers were evaluated for existing and build-out flow conditions, modeling results identified pipe capacity deficiencies in the future build-out conditions, and recommendations for improvements in the Hwy 213 trunk sewers were provided to mitigate for the capacity impacts of future buildout flows. The recommended capacity improvements included upsizing sections of the Hwy 213 trunk sewers from 21" to 24" pipe.
         1. In addition to upsizing Hwy 213 sewers, another recommendation was for the implementation of an Inflow and Infiltration (I/I) Abatement Program in order to reduce the flows upstream of the Hwy 213 trunk sewers. Reducing the upstream flows may minimize and/or eliminate the need to upsize the Hwy 213 sewers.
         2. The City plans to implement an I/I Abatement Program, reduce flows to Hwy 213 trunk sewers to the maximum extent practicable and minimize and/or eliminate the need to upsize the Hwy 213 sewers.
   f. Per the 2014 SSMP, the BRCP area, including Beavercreek Rd Apts, is planned to be served by the Beavercreek Rd basin from a future 15" sanitary sewer main extension in Beavercreek Rd starting just south of Marjorie Lane to the development and continuing south to the south end of Beavercreek Rd. However, although not the preferred approach, *2014 SSMP Appendix I: Glen Oak Road Analysis (Analysis),* does contemplate discharging a portion of the BRCP area flows into the Glen Oak Basin.
      i. *The Analysis* evaluates alternatives for routing some of the future BRCP flows to the Glen Oak basin and provides recommendations for capacity improvements needed to mitigate for the deficiencies in the existing system.
         1. *The Analysis, Routing Alternative C,* showed results of extensive surcharging and potential overflow conditions in the Glen Oak basin and Hwy 213 collection systems when routing approximately 421 gpm of BRCP flows to the Glen Oak basin, including 105gpm of Beavercreek Rd Apts.
         2. The estimated peak flow of 421 gpm is based on the flow expected from BRCP areas that would most likely cross to the Glen Oak basin if developing the

properties prior to the future 15-inch sewer extension being constructed in Beavercreek Rd.

3. To manage the excessive surcharging and potential overflow conditions in the Glen Oak basin and Hwy 213 sewers, modeling results indicate upsizing the City's Hwy 213 sewers is needed. The estimated cost to upsize approximately 1,400 feet of existing 12-inch to 15-inch is $537,000 and 2,400 feet of existing 21-inch to 24-inch is $2,381,000, for a total cost of $2,918,000.

ii. If the BRCP areas identified in *The Analysis, Routing Alternative C,* develop prior to the future 15-inch trunk sewer being constructed in Beavercreek Rd, and convey the estimated peak flow of 421gpm to the Glen Oak basin, then the capacity improvements for upsizing the 12" and 21" Hwy 213 sewers are required.

1. The City will assess each BRCP development proposal for proportional share of Hwy 213 sewer capacity improvements when the BRCP areas identified in *The Analysis, Routing Alternative C* propose to develop prior to the future Beavercreek Rd 15-inch sewer improvements.
2. The total proportional share contribution for said BRCP areas, with a total flow of 421 gpm, is 100% of the 15-inch sewer cost, $537,000, and 69% of the 24-inch sewer cost, $1,643,000, for a total contribution of $2,180,000.
    a. The following should be noted:
        i. Modeling results show upsizing the Hwy 213 sewers from 12-inch to 15-inch is not required when the said BRCP flows are not routed to the Glen Oak basin.
        ii. Modeling results show upsizing the Hwy 213 sewers from 21-inch to 24-inch is required when 613 gpm buildout flows are added to the Hwy 213 trunk sewers. The said BRCP flows are 69% of these buildout flows.
3. Beavercreek Apts, being one of the properties included in the said BRCP areas with a flow of approximately 105 gpm, is approximately 25% of the said BRCP areas total peak flow.
    a. Beavercreek Rd. Apts shall be conditioned to pay a fee-in-lieu for the Hwy 213 sewer improvements.
    b. Fee-in-lieu is based on 25% of BRCP's total proportional share contribution, and 25% of the total contribution is $545,000.

3. Developer's engineer, Keller Associates, submitted a Technical Memo, dated 9/9/2014 that evaluated sewer service to the Beavercreek Rd Apts development.
    a. Keller's Memo:
        i. Memo acknowledges that the 2014 SSMP evaluation of the existing collection system appears to be in line with industry standards and the best long-term approach for servicing the entire Beavercreek service area appears to be a new trunkline sewer along Beavercreek Rd in the Beavercreek basin.
        ii. Memo documents the Beavercreek Apts development estimated peak flow to be 105 gpm.
        iii. Memo includes recommendation to accommodate the Beavercreek Apts development flows in the Glen Oak Rd sewers and direct flows across sewer basins on a short-term basis.
            1. Further comment is made that the Beavercreek Apts could be routed into future Beavercreek Sewer and recommends provisions for this transfer be incorporated into the design of the Beavercreek Apts development.
            2. Note: The development application shows proposed sanitary sewer service to be connected to sewers in the Glen Oak basin.

3. Memo references the City's desire to reserve flows and the resulting available capacity is uncommitted. *City Comment:: This comment is inaccurate as the City through the adoption of the 2014 SSMP has committed the existing remaining capacity of the Glen Oak collection system for the planned developments that must flow to the Glen Oak basin and Hwy 213 sewers.*

iv. Memo includes recommendation to bolt down and seal manholes with only two feet of cover. *City Comment: The City manages excessive surcharging of pipes through upsizing the pipe to increase the capacity and/or reducing the flow to the sewer through I/I abatement or other flow reduction measure. Bolting down the manholes does not resolve the capacity deficiencies of the sewer pipes.*

v. Memo includes comments about the BRCP areas being routed to the Glen Oak Rd basin long-term and completing downstream improvement in Hwy 213 to alleviate surcharged conditions in the City's Glen Oak Rd sewers.

vi. Memo includes comments about inflow and infiltration I/I and reducing the amount of I/I to free up pipe capacity for development.
   1. Memo also includes comments about Keller's investigation about benchmarks for estimating typical cost per gallon for I/I removed from collection systems.
   2. Keller found local agencies have no quantifiable method to calculate the I/I reduction and cost per gallon.
   3. Keller found there is a methodology that is being used by municipalities that calculates a cost to offset I/I.

vii. Memo includes three sections titled: "Background", "General Observations", and "Available Capacity in the Glen Oak Sewer Line".

viii. Memo does not include a section for recommendations and/or conclusions.

b. PW Engr Staff Findings in reference to Keller's Technical Memo:

i. Memo does not include a section for specific recommendations and/or conclusions so staff reviewed the content of the Memo and made interpretation of the intent for the statements that were presented.

ii. There is no reliable methodology that quantifies the amount of I/I reduction that would result from an I/I Abatement Program. Therefore, there is no reliable method to calculate the cost per gallon of I/I removed from the sewer system until the I/I is physically removed and measured through flow monitoring before and after the abatement improvements are implemented.

iii. Routing flows from the BRCP areas, including Beavercreek Apts, to the Glen Oak Rd utilizes capacity in the Glen Oak Rd basin and Hwy 213 collection systems that was planned for the future buildout of the Glen Oak basin and Hwy 213. The BRCP flows were planned for the Beavercreek Rd basin.

iv. *The 2014 SSMP Analysis Routing Alternative C* identifies improvements to the Hwy 213 sewers to mitigate for the capacity impacts related to the BRCP areas' additional flows.
   1. If development occurs in the said BRCP areas prior to the future 15-inch sewer extension in Beavercreek Rd and development flows are directed across basins to the Glen Oak basin, then the Hwy 213 sewer capacity improvements are required to manage the surcharging and potential overflow conditions.
   2. Beavercreek Rd Apt is one of the properties in the said BRCP areas and is the first development proposing to cross basins.
   3. The total estimated additional peak flows from said BRCP areas is 421 gpm and Beavercreek Apts flow is approximately 25% of this flow, 105 gpm.

v. The City plans to start an I/I abatement program in 2015/2016 for the Basins that contribute to Hwy 213 sewers and it is unknown at this time whether there will be a reduction in I/I through this proposed program.

vi. To allow the said BRCP areas, including Beavercreek Rd Apts, to cross basins and direct flows to the Glen Oak basin, the Hwy 213 sewer capacity improvements are required to mitigate for the additional flows that will contribute to excessive surcharging within the Glen Oak and Hwy 213 collection systems.

1. These improvements are identified in *2014 SSMP, Appendix I: Glen Oak Road Analysis, Figure C-5, Routing Alternative C* and includes: upsizing the City's Hwy 213 sewers and estimated costs, approximately 1,400 feet of existing 12-inch to 15-inch is $537,000 and 2,400 feet of existing 21-inch to 24-inch is $2,381,000, for a total cost of $2,918,000.
2. The proportional share of cost for the said BRCP areas with a total flow of 421 gpm, is 100% of the 15-inch sewer cost, $537,000, and 69% of the 24-inch sewer cost, $1,643,000, for a total contribution of $2,180,000.
3. The proportional share of cost for the Beavercreek Apts, being one of the properties in said BRCP areas, with a total flow of 105 gpm is 25% of BRCP's total proportional share contribution, and 25% of the total contribution is $545,000.

vii. Requirements for connection to the City's existing Glen Oak system and sewer improvements for service extensions:

1. Connection to the existing Glen Oak system shall be located in the public road right-of-way, Meyers Road, at the existing manhole at Meyers Rd and Emerson Ct.
2. The design of the new 8-inch connecting sewer shall incorporate the design of the future 15-inch sanitary sewer so in the future the Beavercreek Apts can be transferred to the Beavercreek basin through a connection from the new 8-inch to the future 15-inch sewer.
3. The new 8-inch sewer shall extend south of the Meyers/Beavercreek intersection in Beavercreek Rd along the frontage of the site with service laterals to serve the proposed buildings with frontage on Beavercreek Rd.
4. The new 8-inch sewer shall not extend north of the Meyers/Beavercreek intersection at this time due to direction of flow to the Glen Oak basin so fee-in-lieu shall be required. Fee-in-lieu for 8-inch sewer along site frontage in Beavercreek Rd from Meyers/Beavercreek intersection to northerly boundary of development. Fee-in-lieu shall include all costs for design, construction and contingencies for a City public agency construction contract for the 8-inch extension.
5. At this time a 15-inch pipe in Beavercreek Rd shall not be required due to the anticipated potential for maintenance and operational problems of having a 15-inch pipe with very little flow contribution, and the future 15-inch connection will most likely not be made within the next 10 years.

c. Conditions of Approval recommended for sewer service to proposed SP 14-01 Beavercreek Apartment Development:

i. To direct flows across sewer basins to the Glen Oak basin:

1. Applicant shall be conditioned to pay a fee-in-lieu for the Hwy 213 sewer improvements based on its proportional share contribution to the additional line capacity.
    a. Beavercreek Apts additional flow is 25% of the BRCP areas total flow.
    b. The proportional share contribution for the Beavercreek Apts, being one of the properties in said BRCP areas, with a total flow of 105 gpm is 25% of

BRCP's total proportional share contribution, and 25% of the total contribution is $545,000.

c. The 2014 SSMP provides the data and information for the basis of the fee-in-lieu costs.

ii. Connection location of proposed sanitary sewer to the existing sewer in the Glen Oak basin:
   1. Applicant shall design 8" sanitary sewer collection system in existing and future public roads with the connection to the existing sanitary sewer system at the manhole located in Meyers Road at Emerson Ct.
   2. Applicant shall refer to the City's standards for typical utility placement within the public street section for location of underground public utilities.
   3. Applicant shall extend the new 8-inch sewer pipe in Meyers Rd to Beavercreek Rd with a crossing of Beavercreek Rd to the future public road system and extend the new 8-inch sewer pipe in Beavercreek Rd to the south across the frontage of the property to serve the proposed buildings fronting Beavercreek Rd.
   4. Beavercreek Apt design shall make consideration of the future Beavercreek Rd 15-inch sewer extension for future and incorporate into the design the future transferring of the new 8-inch to the future 15-inch.

iii. Sanitary Sewer improvements along frontage of development in Beavercreek Road.
   1. Applicant shall pay fee-in-lieu for 8-inch sanitary sewer along the site frontage north of the Meyers/Beavercreek intersection to the northerly site boundary of development for the future Beavercreek Rd sanitary sewer extension.
   2. Fee-in-lieu for 8-inch sewer along frontage shall be based on all costs for design, construction and contingencies for a City public agency construction contract.
   3. Applicant shall provide an engineer's estimate, signed and stamped by the engineer, for the City's review and approval.

iv. There may be other conditions of approval for consideration and still to be determined.

Water:

1. City's 2012 Water Master Plan
   Findings:
   a. Beavercreek Apts development is located in the Beavercreek Rd Concept Plan (BRCP) area.
   b. Beavercreek Apts development has ground elevations of 480 feet and greater.
   c. BRCP area with ground elevations of 480 feet and greater are planned to be served by the future expanded Fairway Downs pressure zone. The future expanded Fairway Downs pressure zone requires the construction of future water facilities that include a storage reservoir and pump station prior to providing water service to the BRCP area with properties that have ground elevations of 480 feet and greater.
   d. Future 12-inch waterline is recommended in Beavercreek Rd from Glen Oak Road to Meyers Road to serve the BRCP area and a future 12-inch waterline extending into the BRCP area where ground elevations are 480 feet and greater.
2. Beavercreek Apts development proposed water service
   Findings:
   a. Beavercreek Apts development wants to develop prior to the expansion of the Fairway Downs pressure zone and construction of the future water facilities planned to serve the BRCP area.
   b. Clackamas River Water (CRW), the City and Developer have found an interim solution for water service prior to the City's Fairway Down pressure zone expansion and construction of the future facilities needed to serve the BRCP area.
   c. CRW Commissioners met on 9/22/2014 and approved to proceed with the following interim plan with reference to water service to Beavercreek Apts:

   i. 800 feet of 12-inch waterline and master meter paid for by developer
   ii. CRW own master meter
   iii. City own 12-inch waterline.
   iv. An Intergovernmental Agreement between CRW and the City providing the terms and conditions of water service

3. Conditions of Approval recommended for Water service to proposed SP 14-01 Beavercreek Apts development:
   a. New water system shall be designed with minimum 12-inch pipe in Beavercreek Road from Glen Oak Rd to Meyers Rd and to be owned by the City, with minimum 8-inch water mains throughout the site, and connection to a new master meter and vault to be owned by Clackamas River Water located at approximately Glen Oak Rd and Beavercreek Rd.
   b. Applicant shall design looping of the new water system and avoid dead-end mains to the maximum extent practicable.
   c. Applicant shall design water system in existing and future public roads to the maximum extent practicable minimizing the need for public waterline easements.
   d. Prior to submitting construction plans to the City, an Intergovernmental Agreement (IGA) between Clackamas River Water (CRW) and the City must be executed. IGA shall include the terms and provisions needed for water service to the development through a proposed master meter to be owned by CRW and 12-inch waterline in Beavercreek Rd to be owned by the City.
   e. Prior to construction plan approval and after execution of the proposed IGA, the Applicant shall receive CRW's written approval of design, plans and specifications for water facilities as agreed upon through the IGA.
   f. Note: There may be other conditions of approval for consideration and still to be determined.

ORDINANCE NO. 07-1021

AN ORDINANCE ANNEXING CERTAIN PROPERTY TO THE CITY OF OREGON CITY

OREGON CITY MAKES THE FOLLOWING FINDINGS:

WHEREAS, The City of Oregon City proposed that certain properties, more fully identified in Exhibit 'A' to this Ordinance, be annexed to the City; and

WHEREAS, the City found that the proposal complied with all applicable legal requirements, as detailed in the findings attached hereto and made a part of this ordinance as Exhibit 'B'; and

WHEREAS, Chapter I, section 3 of the Oregon City Charter of 1982 requires voter approval for annexations such as the one proposed; and

WHEREAS, the annexation of the identified properties was submitted to the voters of the City of Oregon City at a special election held on November 6, 2007; and

WHEREAS, the Clackamas County Clerk has returned the official figures indicating the results of the election held on November 6, 2007; and

WHEREAS, the official figures returned by the Clackamas County Clerk indicate that a majority of the voters of the City of Oregon City voted to approve the annexation of the identified properties; and

WHEREAS, the identified properties are currently in Clackamas County Rural Fire Protection District # 1; and

WHEREAS, the identified properties are currently within the Clackamas County Service District for Enhanced Law Enforcement; and

WHEREAS, the identified properties are currently within the Clackamas River Water District; and

WHEREAS, the Tri-City Service District requires the City's concurrence to annexations into the District; and

WHEREAS, the City Commission concurs that the Tri-City Service District can annex the identified properties into their sewer district.

NOW, THEREFORE, OREGON CITY ORDAINS AS FOLLOWS:

Section 1. That the area further identified in the legal description attached hereto as Exhibit "A", is hereby annexed to and made a part of the City of Oregon City.

Section 2. That the findings attached hereto as Exhibit 'B' are hereby adopted.

Section 3. That the territory identified in Exhibit "A" is hereby withdrawn from Clackamas County Rural Fire Protection District # 1.

Section 4. That the territory identified in Exhibit "A" is hereby withdrawn from Clackamas County Service District for Enhanced Law Enforcement.

Section 5. That the territory identified in Exhibit "A" is hereby withdrawn from the Clackamas River Water District.

Section 6. The City hereby concurs with and approves the annexing of the territory identified in Exhibit "A" into the Tri-City Service District by the Clackamas County Board of Commissioners, to the extent allowed by law.

Section 7. That the effective date for this annexation is the date this ordinance is submitted to the Secretary of State, as provided in ORS 222.180.

Read for the first time at a regular meeting of the City Commission held on the 19th day of December 2007, and the foregoing ordinance was finally enacted by the City Commission this 19th day of December 2007.

ALICE NORRIS
Mayor

ATTESTED this 19th day of December 2007

NANCY IDE
City Recorder

AN07-02
CL 1807

Exhibit A

Legal Description

Part of the SE ¼ of Section 9, the South ½ of Section 10 and of the North ½ of Section 15 Township 3 South, Range 2 East of the Willamette Meridian, County of Clackamas, State of Oregon, and further described as follows:

Commencing at the northeast corner of the Andrew Hood DLC No. 44 thence North 00 °30' East along the extension of the East line of said claim, a distance of 20 feet to the North right-of-way of John H. Loder Road and to the True Point of Beginning;

thence South 89°15' West along the Northerly right of way of said road 620.4 feet to the Northerly extension of the Westerly boundary of that parcel described in Clackamas County Deed Record No. 94-00722;

thence South 0°30' West a distance of 371.12 feet to the Southwest corner of that parcel described in said Deed Record No. 94-00722;

thence South 89° 15' West a distance of 784.08 feet to a stone marked "X" on the North boundary of a tract of land conveyed to David F. Moehunke, et ux, in Book 157, Page 360, Deed Records;

thence North 0° 30' East 371.12 feet along the West boundary and the Northerly extension thereof of a tract of land conveyed to Charles G. Thomas, et ux, by Book 341, Page 570, Clackamas County Deed Records to a point in the Northerly right of way of said Loder Road,

thence South 89°15' West along the North boundary of said Northerly right of way of said Loder Road a distance of 465 feet more or less, to a point being the Northwesterly extension of the Northeasterly boundary of that parcel conveyed to the Hall Family Investment Co, LLC in Clackamas County Deed #98-130715;

thence South 40° 45' East a distance of 485 feet more or less, to an iron pipe as recorded on P.S. 3494, Clackamas County Surveyor's Office;

thence South 49° 55' West 670 feet to an iron pipe as recorded on said P.S. 3494 located on the Northeasterly right of way of the Oregon City to Highland Road, now known as Beavercreek Road;

thence South 40°37' East along the Easterly right of way of said Beavercreek Road 3135 feet, more or less, to a point being the south most southwest corner of that parcel of land conveyed to Wayne C. Hall and Helen E. Hall and recorded in Clackamas County Deed Records in Book 546, Page 288;

thence N 87° 11' 21" E along the south line of said Hall tract, 445.92 feet to a 5/8" iron rod set at the south most southeast corner of said Hall tract;

thence N 0° 46' 16" E, 570.00 feet to a 5/8" iron rod;

thence N 0° 46' 16" E, 410.31 feet to 5/8" iron rod;

thence N 0° 46' 57" E, 480.44 feet to a 1/2" iron rod;

thence N 27° 12' 06" W, 533.04 feet to 5/8" iron rod;

thence N 12° 49' 21" E, 306.64 feet to 5/8" iron rod;

thence S 89° 13' 00" E, 197.71 feet to 5/8" iron rod;

thence S 89° 13' 00" E, 500.04 feet to 5/8" iron rod set in a mound of stone at the north most southeast of said Hall tract and also being the West line of Government Lot 2 of Section 10 of Township 3 South, Range 2 East of the Willamette Meridian;

thence North 0° 13' East 892.13 feet along, said Lot 2 and the Urban Growth Boundary to the Northerly right of way of Loder Road;

thence South 89°15' West tracing said Northerly right of way of said Loder Road 987.36 feet to the Point of Beginning.

Exhibit B

BEFORE THE OREGON CITY
CITY COMMISSION

In the Matter of Resolution No. 07-24 to set the election date of November 6, 2007 for the annexation of 122 acres located east of Beavercreek Road and South of Loder Road into Oregon City.	FINDINGS OF FACT, CONCLUSIONS OF LAW AND FINAL ORDER IN OREGON CITY FILE No. AN 07-02.

I. INTRODUCTION

Northwest Development Solutions (the "Applicant") submitted application for the annexation of 12 properties totaling 122 acres into the city limits of Oregon City. The Planning Commission held evidentiary hearings on July 16th and July 23rd, 2007, after which the Planning Commission deliberated and unanimously recommended approval of the request to the City Commission for their consideration. On August 1st, 2007, the City Commission held a public hearing and after hearing all of the testimony and considering all of the evidence, tentatively voted to approve the annexation and recommend that the issue be sent to the citizens for a vote on November 6th, 2007. The Commission's reasons for approving the application are set forth in these findings of fact, conclusions of law, and final order.

II. FINDINGS

Annexation 07-02 was initiated by consent petition of a 100% of the property owners and voters. The territory contains approximately 122 acres, has 5 single-family residences, 7 commercial structures, a population of 9 and is valued at $1,566,711. The properties have a comprehensive plan designation of Future Urban Holding, which is a holding designation until a Concept Plan for the Beavercreek Road area is completed. The zoning designation will remain Future Urban 10-acre minimum until adoption of the Beavercreek Road Concept Plan and the appropriate Comprehensive Plan and Zoning designation can be applied to the individual properties. A majority of the public testimony addressed the draft Beavercreek Road Concept Plan design and process and was not applicable to the annexation request before the commission.

A. Metro Boundary Change Criteria.

1. Consistency with directly applicable provisions in ORS 195 agreements or ORS 195 annexation plans.

Findings. There are no adopted 195 annexation plans or agreements applicable to this area. For the foregoing reasons, this criterion is met.

2. Consistency with directly applicable provisions of urban planning area agreements between the annexing entity and a necessary party.

Findings. A necessary party is defined as any county, city or district whose jurisdictional boundary or adopted urban serve area includes any part of the affected territory or who provides any urban service to any portion of the affected territory, Metro, and any other unit of local government, as defined in ORS 190.003, that is a party to any agreement for provisions of an urban service to the affected territory. Proper notice was given to all necessary parties and the only comments received where from the Public Safety Director of Oregon City, which were addressed to the satisfaction of the Director by the applicant.

A citizen contended that the County Commissioner's have not been briefed on the annexation, thus it is not possible to know if the necessary party has contested the annexation.

The County Commissioner's office was mailed notice of the annexation request on June 12th, 2007, indicating the time and location of the Planning and City Commission public hearings and requesting comments, either in writing or during testimony at the hearings. No comments were received from the County.

The City and County have an Urban Growth Management Agreement (UGMA), which is part of their Comprehensive Plans. The territory to be annexed falls within the Urban Growth Management Boundary (UGMB) identified for Oregon City and is subject to the agreement. The County agreed to adopt the City's Comprehensive Plan designation for the area, which currently is Future Urban 10 and the agreement presumes that all the urban lands within the UGMB will ultimately annex to the City and that the responsibility for the public facilities shall fall the City.

The City agrees to concur with the Tri-City Service District's annexation of the subject properties upon voter approval of the city annexation. This territory is currently within the Clackamas River Water District, with which the city does not have an urban service agreement, however; ORS 222.120 allows the city to specify that the territory by automatically withdrawn from the water district upon annexation, which will occur upon voter approval of the city annexation. The City shall also withdraw the territory from the County Service District for Law Enforcement and Clackamas County R.F.P.D #1. For the foregoing reasons, this criterion is met.

3. Consistency with directly applicable standards for boundary changes contained in comprehensive land use plans and public facility plans.

Findings. The AN 07-02 staff report demonstrates consistency with the existing comprehensive land use plans and public facility plans. The annexation of the 122 acres and 5 single-family homes will have minimal impact on the existing services and infrastructure and the properties are contiguous to the existing City limits. The properties will be zoned Future Urban 10 until the Beavercreek Concept Plan and implementing ordinances are adopted. Approval of the Beavercreek Road Concept Plan will comply with all applicable Comprehensive Plan requirements and the public facility plans will be updated to account for the future impacts of the full build out of the 122 acres. The FU-10 zoning designation is a holding zone that prevents the property from being developed at urban standards until such time as the Concept Plan and implementing ordinances are adopted, having demonstrated compliance with the Comprehensive Plan, including updates to the city master plans and capital improvements plans. For the foregoing reasons, this criterion is met. At the public hearing before the city commission, several parties raised the issue of consistency with the Beavercreek Concept Plan. As discussed below, that plan had not yet been adopted and is not a criterion for this annexation.

4. Consistency with directly applicable standards for boundary changes contained in the Regional framework or any functional plans.

Findings. The law that requires Metro to adopt criteria for boundary changes specifically states that those criteria shall include "...compliance with adopted regional urban growth goals and objectives, functional plans....and the regional framework plan of the district

(Metro)." The Growth Management Functional Plan was reviewed and found not to contain any criteria directly applicable to boundary changes. In addition, the Regional Framework Plan was reviewed and found not to contain specific criteria applicable to boundary changes. For the foregoing reasons, this criterion is met.

5. Whether the proposed boundary change will promote or not interfere with the timely, orderly and economic provision of public facilities and services.

Findings. Annexation of the existing five homes will have virtually no affect on the timely, orderly and economic provision of public facilities and services. The City will obtain a small increase in property tax revenues from adding additional assessed value to its tax roll as a result of annexing the territory and there is adequate public facilities and services to provide for the additional 5 homes and 7 commercial buildings. The City will also obtain land use jurisdiction over the territory. The Beavercreek Concept Plan will address the overall impact to the city of a much larger swath of land, which includes this piece, but that plan has not yet been completed. The territory to be annexed under that plan will include approximately 20 acres of employment and 48 acres of mixed employment, which will provide employment opportunities that are greatly lacking in Oregon City. Because that plan has not been adopted, it is not an applicable criterion and there has been no showing that annexation of this property to the city will interfere with the timely, orderly and economic provision of public facilities and services to the area. The applicant has also proposed a Police Funding Fee to be collected at time of building permit to off-set the impacts on Police service. For the foregoing reasons, this criterion is met.

6. Consistency with other applicable criteria for the boundary change in question under state and local law.

Findings. The proposed annexation complies with all applicable state and local laws as demonstrated in these findings of fact and the AN 07-01 staff report. For the foregoing reasons, this criterion is met.

B. Oregon City Municipal Code: Section 6 of Chapter 14.

1. Adequacy of access to the site.

Findings. Access is provided from Beavercreek Road to the west and Loder Road to the north. The City-County UGMA requires the annexation to include the adjacent portions of all county streets. There is adequate frontage from public streets to access the site in a safe and efficient manner. For the foregoing reasons, this criterion is met.

2. Conformity of the proposal with the City's Comprehensive Plan.

Findings. The Comprehensive Plan identifies a need to provide an adequate supply of land for major industrial employers with family-wage jobs, ensure that land-use patterns create opportunities for citizens to live closer to their workplace and require that a majority of the lands east of Clackamas Community College, which includes this area, shall be

designated in such a manner that it encourages family-wage jobs in order to generate new jobs and move towards meeting the city's employment goals.

The Beavercreek Road Concept Plan, which includes this 122 acres, is designed to meet City and Metro requirements for the creation and protection of employment lands within the study area. The site contains approximately 20 acres of employment and 48 acres of mixed employment, which will allow citizens to live closer to employment opportunities and will provide lands that will offer family-wage jobs and move the City closer to meeting their employment goals.

The proposed annexation properties are within the Beavercreek Road Concept Planning area, but no concept plan has been adopted. Therefore, the Concept Plan is not applicable to this annexation.

3. Adequacy and availability of public facilities and services to service potential development.

Findings. as discussed below, the Facilities and Services discussion of the staff report indicate that there are adequate services to support the annexation at the zoning designation of FU-10. To the extent additional development will occur, the property will have to be re-zoned, which will not occur until the Concept Plan has been approved. The Concept Plan will have to demonstrate that public facilities and services for potential development will be accounted for once the Beavercreek Road Concept Plan is adopted. The concept plan will identify the impacts to the public facilities and services and the remedies necessary to accommodate the potential development on the annexed properties.

There are existing water lines and sanitary sewer lines in Beavercreek Road north of the subject site and in Glen Oak Road that can be extended to the site to provide service. The necessary water, sanitary, and stormwater improvements necessary to accommodate the future development of the area will be included in the city's master plans to ensure adequacy of the systems.

The Beavercreek Concept Plan will integrate a multi-modal transportation system with a mixed-use development pattern to achieve a highly efficient and sustainable design. The concept plan will identify a network of internal and external pedestrian, bicycle, transit, and street connections that serve the study area and connect it to the surrounding community and the broader region. The concept plan will ensure that the land brought into the UGB is planned in an efficient and sustainable manner that will identify compatible land uses, including industrial, office, commercial, and residential uses, thereby reducing the need for vehicle trips, improving the efficiency of public transportation, offering multi-modal transportation options, and reducing the need to expand the UGB in the future.

The Concept Plan will address traffic impacts, remedies and costs that are necessary to accommodate the additional growth in this area. The improvements will be added to the Transportation System Plan as part of the adoption of the Beavercreek Concept Plan and will meet the necessary Level of Service requirements of the city and will meet the intent of the Transportation Planning Rule. For the foregoing reasons, this criterion is met.

4. Compliance with applicable sections of Oregon Revised Statutes Chapter 222, and Metro Code 3.09.

Findings. The only criterion in ORS 222 is that annexed lands be contiguous to the City. The site is contiguous at its border with city property for about 4,200 feet along the exterior area boundary. The Metro Code criteria are discussed above. This report considers each factor and the Conclusions and Reasons in the attached Staff Report Findings and Reasons demonstrate that these criteria are satisfied. For the foregoing reasons, this criterion is met.

5. Natural hazards identified by the City, such as wetlands, floodplains, and steep slopes.

Findings. Preliminary review has identified water resource areas that will require further investigation at time of development to demonstrate compliance with existing Oregon City Municipal Code water resource protection standards. For the foregoing reasons, this criterion is met.

6. Any significant adverse effects on specially designated open space, scenic historic or natural resource areas by urbanization of the subject property at the time of annexation.

Findings. The property is in the Newell and Thimble drainage basin according to the Drainage Master Plan. There are no designated areas affected by urbanization of this property.

7. *Lack of any significant adverse effects on the economic, social and physical environment of the community by the overall impact of annexation.*

Findings. Annexation of the existing five homes will have virtually no affect on the economic, social, or physical environment of the community. The Commission interprets the "community" as including the City of Oregon City and the lands within its urban service area. The City will obtain a small increase in property tax revenues from adding additional assessed value to its tax roll as a result of annexing the territory. The City will also obtain land use jurisdiction over the territory. Finally it will have service responsibilities including fire, police, and general administration. The City delivers police service to the unincorporated area in the course of patrolling to deliver service to the incorporated area. The increases in service responsibilities to the area that result from the annexation are insignificant, though an additional five homes may impact the existing response time of the Police Department.

There are adequate public facilities and services to support annexation of this property at the FU-10 zoning. The Beavercreek Concept Plan will address any re-zoning for further urbanization. The plan will providing for a mix of employment, office, commercial and residential that will provide employment, entertainment and services within close proximity to existing and planned residential development. The ability to provide these opportunities in such close proximity to the residential development will limit the impacts on the infrastructure and services, include transportation. The addition of employment lands will have a positive effect on the economic, social and physical environment of Oregon City by providing employment opportunities in a region severely lacking those opportunities, increase the assessed value with

employment, office and commercial uses and providing a unique and urban physical environment that will be to the benefit of the residents of Oregon City.

The concept plan call for a mix of housing sizes and types, creating a truly mixed community that serves many income levels and demographics, which will improve the social environment of Oregon City. The compact urban development will also increase the opportunities for public transportation opportunities, potentially expanding the existing Tri-Met service from Clackamas Community College to the west of the site and providing an alternative to the single occupancy vehicle trip, thereby improving the economic and physical environment of Oregon City. For the foregoing reasons, this criterion is met.

III. CONCLUSION

For the reasons noted above, the City Commission has determined that the Applicant has met its burden of proof with respect to the Annexation and adopts Resolution No. 07-24 and set Proposal No. AN 07-02 for an election on November 6, 2007. The City Commission shall withdraw the territory from the County Service District for Enhanced Law Enforcement, Concur with Tri-City Service District's annexation of the subject property upon voter approval of the city annexation, will withdraw from the Clackamas County R.F.P.D #1 and Clackamas River Water District, will require all consenting property owners to sign a waiver of Measure 37 rights prior to the City Commission adopting a final ordinance accepting a positive annexation election result and shall accept the financial solution offered by the applicant to address the police funding shortcomings.

ADOPTED this 15th day of August 2007.

OREGON CITY COMMISSION

_____

Alice Norris, Mayor

Final Documents

for

Annexation to

Oregon City

CL1807

Ordinance: 07-1021

Annexation: AN 07-02

DOR: 3-1831-2008

Secretary of State: AN 2008-0068

Office of the Secretary of State

BILL BRADBURY
Secretary of State

Archives Division
MARY BETH HERKERT
Director

800 Summer St. NE
Salem, Oregon 97310
(503) 373-0701

Facsimile (503) 373-0953

March 27, 2008

Metro
Linda Martin
600 NE Grand Ave
Portland, Oregon 97232-2736

Dear Ms. Martin:

Please be advised that we have received and filed, as of March 27 2008, the following records annexing territory to the following:

Ordinance/Resolution Number(s)	Our File Number
07-1020 (Oregon City)	AN 2008-0067
07-1021 (Oregon City)	AN 2008-0068

For your records please verify the effective date through the application of ORS 199.519.

Our assigned file number(s) are included in the above information.

Sincerely,

Linda Bjornstad

Linda Bjornstad
Official Public Documents

cc: County Clerk(s)
Department of Revenue
ODOT
Population Research Center

CITY OF OREGON CITY
PUBLIC WORKS

ENGINEERING GROUP
CODE ENFORCEMENT GROUP
City Engineer/Public Works Director
P.O. Box 3040
320 Warner Milne Road
Oregon City, OR 97045
(503) 657-0891
Fax (503) 657-7892

OPERATIONS GROUP
122 S. Center Street
Oregon City, OR 97045
(503) 657-8241
Fax (503) 650-9590

www.orcity.org

March 20, 2008

Joanna Mensher
Metro/DRC
600 NE Grand Ave
Portland, OR 97232

Re: Oregon City AN07-02 (CL1807) Final Packet

Dear Ms. Mensher:

Enclosed is the final packet for the referenced City of Oregon City annexation proposal for your processing to the Secretary of State. This packet contains:

- Ordinance 07-1021
- Department of Revenue Final Approval
- Legal Description
- Findings of Fact with Conclusions and Reasons for Decision
- Annexation Map
- Certified copy of Election Results
- A check for the Metro Mapping Fee of $400.00 (to be mailed)

Your prompt processing is appreciated. If I can be of any further assistance, please call.

Sincerely,

Robert C. Cullison, E.I.T.
Development Services Manager

Encl: As stated

ORDINANCE NO. 07-1021

AN ORDINANCE ANNEXING CERTAIN PROPERTY TO THE CITY OF OREGON CITY

OREGON CITY MAKES THE FOLLOWING FINDINGS:

WHEREAS, The City of Oregon City proposed that certain properties, more fully identified in Exhibit 'A' to this Ordinance, be annexed to the City; and

WHEREAS, the City found that the proposal complied with all applicable legal requirements, as detailed in the findings attached hereto and made a part of this ordinance as Exhibit 'B'; and

WHEREAS, Chapter I, section 3 of the Oregon City Charter of 1982 requires voter approval for annexations such as the one proposed; and

WHEREAS, the annexation of the identified properties was submitted to the voters of the City of Oregon City at a special election held on November 6, 2007; and

WHEREAS, the Clackamas County Clerk has returned the official figures indicating the results of the election held on November 6, 2007; and

WHEREAS, the official figures returned by the Clackamas County Clerk indicate that a majority of the voters of the City of Oregon City voted to approve the annexation of the identified properties; and

WHEREAS, the identified properties are currently in Clackamas County Rural Fire Protection District # 1; and

WHEREAS, the identified properties are currently within the Clackamas County Service District for Enhanced Law Enforcement; and

WHEREAS, the identified properties are currently within the Clackamas River Water District; and

WHEREAS, the Tri-City Service District requires the City's concurrence to annexations into the District; and

WHEREAS, the City Commission concurs that the Tri-City Service District can annex the identified properties into their sewer district.

NOW, THEREFORE, OREGON CITY ORDAINS AS FOLLOWS:

Section 1. That the area further identified in the legal description attached hereto as Exhibit "A", is hereby annexed to and made a part of the City of Oregon City.

Section 2. That the findings attached hereto as Exhibit 'B' are hereby adopted.

Section 3. That the territory identified in Exhibit "A" is hereby withdrawn from Clackamas County Rural Fire Protection District # 1.

Section 4. That the territory identified in Exhibit "A" is hereby withdrawn from Clackamas County Service District for Enhanced Law Enforcement.

Section 5. That the territory identified in Exhibit "A" is hereby withdrawn from the Clackamas River Water District.

Section 6. The City hereby concurs with and approves the annexing of the territory identified in Exhibit "A" into the Tri-City Service District by the Clackamas County Board of Commissioners, to the extent allowed by law.

Section 7. That the effective date for this annexation is the date this ordinance is submitted to the Secretary of State, as provided in ORS 222.180.

Read for the first time at a regular meeting of the City Commission held on the 19th day of December 2007, and the foregoing ordinance was finally enacted by the City Commission this 19th day of December 2007.

ALICE NORRIS
Mayor

ATTESTED this 19th day of December 2007.

NANCY IDE
City Recorder

DOR 3-1831-2008

Notice to Taxing Districts

ORS 308.225

OREGON DEPARTMENT OF REVENUE
Cadastral Information Systems Unit
PO Box 14380
Salem, OR 97309-5075
(503) 945-8297, fax 945-8737

City of Oregon City
Robert C. Cullison
P.O. Box 3040
Oregon City, OR 97045

Description and Map Approved
March 20, 2008
As Per ORS 308.225

☒ Description ☒ Map received from: CITY
On: 3/19/2008

This is to notify you that your boundary change in Clackamas County for

ANNEX TO CITY OF OREGON CITY; WITHDRAW FROM SEVERAL DISTRICTS (CL1807)

ORD.#07-1021/AN07-02

has been: ☒ Approved 3/20/2008
☐ Disapproved

Notes:

Department of Revenue File Number: 3-1831-2008

Prepared by: Elise Bruch, 503-945-8344

Boundary: ☒ Change ☐ Proposed Change
The change is for:

☐ Formation of a new district
☒ Annexation of a territory to a district
☒ Withdrawal of a territory from a district
☐ Dissolution of a district
☐ Transfer
☐ Merge

Exhibit A

Legal Description

Part of the SE 1/4 Section 9, the South 1/2 of Section 10 and of the North 1/2 of Section 15 Township 3 South, Range 2 East of the Willamette Meridian, County of Clackamas, State of Oregon, and further described as follows:

Commencing at the northeast corner of the Andrew Hood DLC No. 44 thence North 00°30' East along the extension of the East line of said claim, a distance of 20 feet to the North right-of-way of John H. Loder Road and to the True Point of Beginning;

thence South 89°15' West along the Northerly right of way of said road 620.4 feet to the Northerly extension of the Westerly boundary of that parcel described in Clackamas County Deed Record No. 94-00722;

thence South 0°30' West a distance of 371.12 feet to the Southwest corner of that parcel described in said Deed Record No. 94-00722;

thence South 89° 15' West a distance of 784.08 feet to a stone marked " X on the North boundary of a tract of land conveyed to David F. Moehunke, et ux, in Book 157, Page 360, Deed Records;

thence North 0°30' East 371.I2 feet along the West boundary and the Northerly extension thereof of a tract of land conveyed to Charles G. Thomas, et ux, by Book 341, Page 570, Clackamas County Deed Records to a point in the Northerly right of way of said Loder Road,

thence South 89°15' West along the North boundary of said Northerly right of way of said Loder Road a distance of 465 feet more or less, to a point being the Northwesterly extension of the Northeasterly boundary of that parcel conveyed to the Hall Family Investment Co, LLC in Clackamas County Deed #98-130715;

thence South 40°45' East a distance of 485 feet more or less, to an iron pipe as recorded on P.S. 3494, Clackamas County Surveyor's Office;

thence South 49°55' West 670 feet to an iron pipe as recorded on said P.S. 3494 located on the Northeasterly right of way of the Oregon City to Highland Road, now known as Beavercreek Road;

thence South 40°37' East along the Easterly right of way of said Beavercreek Road 3135 feet, more or less, to a point being the south most southwest corner of that parcel of land conveyed to Wayne C. Hall and Helen E. Hall and recorded in Clackamas County Deed Records in Book 546, Page 288;

thence N 87°11' 21" E along the south line of said Hall tract, 445.92 feet to a 5/8" iron rod set at the south most southeast corner of said Hall tract;

thence N 0° 46' 16" E, 570.00 feet to a 5/8" iron rod;

thence N 0° 46' 16" E, 410.31 feet to 5/8" iron rod;

thence N 0° 46' 57" E, 480.44 feet to a 1/2" iron rod;

thence N 27° 12' 06" W, 533.04 feet to 5/8" iron rod;

thence N 12° 49' 21" E, 306.64 feet to 5/8" iron rod;

thence S 89° 13' 00" E, 197.71 feet to 5/8" iron rod;

thence S 89° 13' 00" E, 500.04 feet to 5/8" iron rod set in a mound of stone at the north most southeast corner of said Hall tract and also being the West line of Government Lot 2 of Section 10 of Township 3 South, Range 2 East of the Willamette Meridian;

thence North 0° 4' 45" East 932.13 feet along said Government Lot 2, the Urban Growth Boundary, and the northerly extension of said west line of Government Lot 2 to the Northerly right of way of Loder Road;

thence South 89° 15' West tracing said Northerly right of way of said Loder Road 987.36 feet to the Point of Beginning.

Exhibit B

BEFORE THE OREGON CITY
CITY COMMISSION

In the Matter of Resolution No. 07-24 to set the election date of November 6, 2007 for the annexation of 122 acres located east of Beavercreek Road and South of Loder Road into Oregon City.	FINDINGS OF FACT, CONCLUSIONS OF LAW AND FINAL ORDER IN OREGON CITY FILE No. AN 07-02.

I. INTRODUCTION

Northwest Development Solutions (the "Applicant") submitted application for the annexation of 12 properties totaling 122 acres into the city limits of Oregon City. The Planning Commission held evidentiary hearings on July 16th and July 23rd, 2007, after which the Planning Commission deliberated and unanimously recommended approval of the request to the City Commission for their consideration. On August 1st, 2007, the City Commission held a public hearing and after hearing all of the testimony and considering all of the evidence, tentatively voted to approve the annexation and recommend that the issue be sent to the citizens for a vote on November 6th, 2007. The Commission's reasons for approving the application are set forth in these findings of fact, conclusions of law, and final order.

II. FINDINGS

Annexation 07-02 was initiated by consent petition of a 100% of the property owners and voters. The territory contains approximately 122 acres, has 5 single-family residences, 7 commercial structures, a population of 9 and is valued at $1,566,711. The properties have a comprehensive plan designation of Future Urban Holding, which is a holding designation until a Concept Plan for the Beavercreek Road area is completed. The zoning designation will remain Future Urban 10-acre minimum until adoption of the Beavercreek Road Concept Plan and the appropriate Comprehensive Plan and Zoning designation can be applied to the individual properties. A majority of the public testimony addressed the draft Beavercreek Road Concept Plan design and process and was not applicable to the annexation request before the commission.

A. Metro Boundary Change Criteria.

1. Consistency with directly applicable provisions in ORS 195 agreements or ORS 195 annexation plans.

Findings. There are no adopted 195 annexation plans or agreements applicable to this area. For the foregoing reasons, this criterion is met.

2. Consistency with directly applicable provisions of urban planning area agreements between the annexing entity and a necessary party.

Findings. A necessary party is defined as any county, city or district whose jurisdictional boundary or adopted urban serve area includes any part of the affected territory or who provides any urban service to any portion of the affected territory, Metro, and any other unit of local government, as defined in ORS 190.003, that is a party to any agreement for provisions of an urban service to the affected territory. Proper notice was given to all necessary parties and the only comments received where from the Public Safety Director of Oregon City, which were addressed to the satisfaction of the Director by the applicant.

A citizen contended that the County Commissioner's have not been briefed on the annexation, thus it is not possible to know if the necessary party has contested the annexation.

The County Commissioner's office was mailed notice of the annexation request on June 12th, 2007, indicating the time and location of the Planning and City Commission public hearings and requesting comments, either in writing or during testimony at the hearings. No comments were received from the County.

The City and County have an Urban Growth Management Agreement (UGMA), which is part of their Comprehensive Plans. The territory to be annexed falls within the Urban Growth Management Boundary (UGMB) identified for Oregon City and is subject to the agreement. The County agreed to adopt the City's Comprehensive Plan designation for the area, which currently is Future Urban 10 and the agreement presumes that all the urban lands within the UGMB will ultimately annex to the City and that the responsibility for the public facilities shall fall the City.

The City agrees to concur with the Tri-City Service District's annexation of the subject properties upon voter approval of the city annexation. This territory is currently within the Clackamas River Water District, with which the city does not have an urban service agreement, however; ORS 222.120 allows the city to specify that the territory by automatically withdrawn from the water district upon annexation, which will occur upon voter approval of the city annexation. The City shall also withdraw the territory from the County Service District for Law Enforcement and Clackamas County R.F.P.D #1. For the foregoing reasons, this criterion is met.

3. Consistency with directly applicable standards for boundary changes contained in comprehensive land use plans and public facility plans.

Findings. The AN 07-02 staff report demonstrates consistency with the existing comprehensive land use plans and public facility plans. The annexation of the 122 acres and 5 single-family homes will have minimal impact on the existing services and infrastructure and the properties are contiguous to the existing City limits. The properties will be zoned Future Urban 10 until the Beavercreek Concept Plan and implementing ordinances are adopted. Approval of the Beavercreek Road Concept Plan will comply with all applicable Comprehensive Plan requirements and the public facility plans will be updated to account for the future impacts of the full build out of the 122 acres. The FU-10 zoning designation is a holding zone that prevents the property from being developed at urban standards until such time as the Concept Plan and implementing ordinances are adopted, having demonstrated compliance with the Comprehensive Plan, including updates to the city master plans and capital improvements plans. For the foregoing reasons, this criterion is met. At the public hearing before the city commission, several parties raised the issue of consistency with the Beavercreek Concept Plan. As discussed below, that plan had not yet been adopted and is not a criterion for this annexation.

4. Consistency with directly applicable standards for boundary changes contained in the Regional framework or any functional plans.

Findings. The law that requires Metro to adopt criteria for boundary changes specifically states that those criteria shall include "...compliance with adopted regional urban growth goals and objectives, functional plans....and the regional framework plan of the district

(Metro)." The Growth Management Functional Plan was reviewed and found not to contain any criteria directly applicable to boundary changes. In addition, the Regional Framework Plan was reviewed and found not to contain specific criteria applicable to boundary changes. For the foregoing reasons, this criterion is met.

5. Whether the proposed boundary change will promote or not interfere with the timely, orderly and economic provision of public facilities and services.

Findings. Annexation of the existing five homes will have virtually no affect on the timely, orderly and economic provision of public facilities and services. The City will obtain a small increase in property tax revenues from adding additional assessed value to its tax roll as a result of annexing the territory and there is adequate public facilities and services to provide for the additional 5 homes and 7 commercial buildings. The City will also obtain land use jurisdiction over the territory. The Beavercreek Concept Plan will address the overall impact to the city of a much larger swath of land, which includes this piece, but that plan has not yet been completed. The territory to be annexed under that plan will include approximately 20 acres of employment and 48 acres of mixed employment, which will provide employment opportunities that are greatly lacking in Oregon City. Because that plan has not been adopted, it is not an applicable criterion and there has been no showing that annexation of this property to the city will interfere with the timely, orderly and economic provision of public facilities and services to the area. The applicant has also proposed a Police Funding Fee to be collected at time of building permit to off-set the impacts on Police service. For the foregoing reasons, this criterion is met.

6. Consistency with other applicable criteria for the boundary change in question under state and local law.

Findings. The proposed annexation complies with all applicable state and local laws as demonstrated in these findings of fact and the AN 07-01 staff report. For the foregoing reasons, this criterion is met.

B. Oregon City Municipal Code: Section 6 of Chapter 14.

1. Adequacy of access to the site.

Findings. Access is provided from Beavercreek Road to the west and Loder Road to the north. The City-County UGMA requires the annexation to include the adjacent portions of all county streets. There is adequate frontage from public streets to access the site in a safe and efficient manner. For the foregoing reasons, this criterion is met.

2. Conformity of the proposal with the City's Comprehensive Plan.

Findings. The Comprehensive Plan identifies a need to provide an adequate supply of land for major industrial employers with family-wage jobs, ensure that land-use patterns create opportunities for citizens to live closer to their workplace and require that a majority of the lands east of Clackamas Community College, which includes this area, shall be

designated in such a manner that it encourages family-wage jobs in order to generate new jobs and move towards meeting the city's employment goals.

The Beavercreek Road Concept Plan, which includes this 122 acres, is designed to meet City and Metro requirements for the creation and protection of employment lands within the study area. The site contains approximately 20 acres of employment and 48 acres of mixed employment, which will allow citizens to live closer to employment opportunities and will provide lands that will offer family-wage jobs and move the City closer to meeting their employment goals.

The proposed annexation properties are within the Beavercreek Road Concept Planning area, but no concept plan has been adopted. Therefore, the Concept Plan is not applicable to this annexation.

3. Adequacy and availability of public facilities and services to service potential development.

Findings. as discussed below, the Facilities and Services discussion of the staff report indicate that there are adequate services to support the annexation at the zoning designation of FU-10. To the extent additional development will occur, the property will have to be re-zoned, which will not occur until the Concept Plan has been approved. The Concept Plan will have to demonstrate that public facilities and services for potential development will be accounted for once the Beavercreek Road Concept Plan is adopted. The concept plan will identify the impacts to the public facilities and services and the remedies necessary to accommodate the potential development on the annexed properties.

There are existing water lines and sanitary sewer lines in Beavercreek Road north of the subject site and in Glen Oak Road that can be extended to the site to provide service. The necessary water, sanitary, and stormwater improvements necessary to accommodate the future development of the area will be included in the city's master plans to ensure adequacy of the systems.

The Beavercreek Concept Plan will integrate a multi-modal transportation system with a mixed-use development pattern to achieve a highly efficient and sustainable design. The concept plan will identify a network of internal and external pedestrian, bicycle, transit, and street connections that serve the study area and connect it to the surrounding community and the broader region. The concept plan will ensure that the land brought into the UGB is planned in an efficient and sustainable manner that will identify compatible land uses, including industrial, office, commercial, and residential uses, thereby reducing the need for vehicle trips, improving the efficiency of public transportation, offering multi-modal transportation options, and reducing the need to expand the UGB in the future.

The Concept Plan will address traffic impacts, remedies and costs that are necessary to accommodate the additional growth in this area. The improvements will be added to the Transportation System Plan as part of the adoption of the Beavercreek Concept Plan and will meet the necessary Level of Service requirements of the city and will meet the intent of the Transportation Planning Rule. For the foregoing reasons, this criterion is met.

4. Compliance with applicable sections of Oregon Revised Statutes Chapter 222, and Metro Code 3.09.

Findings. The only criterion in ORS 222 is that annexed lands be contiguous to the City. The site is contiguous at its border with city property for about 4,200 feet along the exterior area boundary. The Metro Code criteria are discussed above. This report considers each factor and the Conclusions and Reasons in the attached Staff Report Findings and Reasons demonstrate that these criteria are satisfied. For the foregoing reasons, this criterion is met.

5. Natural hazards identified by the City, such as wetlands, floodplains, and steep slopes.

Findings. Preliminary review has identified water resource areas that will require further investigation at time of development to demonstrate compliance with existing Oregon City Municipal Code water resource protection standards. For the foregoing reasons, this criterion is met.

6. Any significant adverse effects on specially designated open space, scenic historic or natural resource areas by urbanization of the subject property at the time of annexation.

Findings. The property is in the Newell and Thimble drainage basin according to the Drainage Master Plan. There are no designated areas affected by urbanization of this property.

7. *Lack of any significant adverse effects on the economic, social and physical environment of the community by the overall impact of annexation.*

Findings. Annexation of the existing five homes will have virtually no affect on the economic, social, or physical environment of the community. The Commission interprets the "community" as including the City of Oregon City and the lands within its urban service area. The City will obtain a small increase in property tax revenues from adding additional assessed value to its tax roll as a result of annexing the territory. The City will also obtain land use jurisdiction over the territory. Finally it will have service responsibilities including fire, police, and general administration. The City delivers police service to the unincorporated area in the course of patrolling to deliver service to the incorporated area. The increases in service responsibilities to the area that result from the annexation are insignificant, though an additional five homes may impact the existing response time of the Police Department.

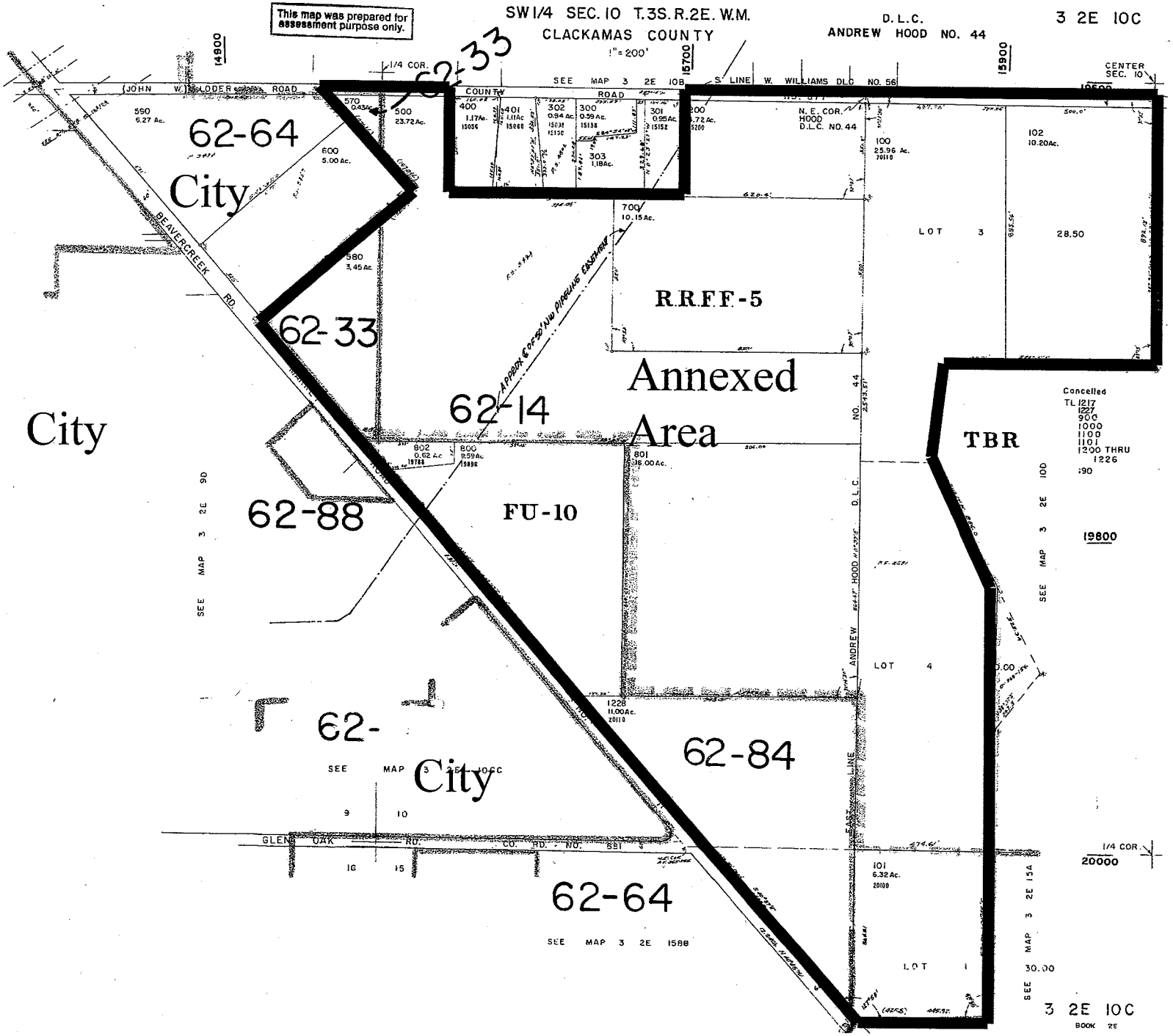
There are adequate public facilities and services to support annexation of this property at the FU-10 zoning. The Beavercreek Concept Plan will address any re-zoning for further urbanization. The plan will providing for a mix of employment, office, commercial and residential that will provide employment, entertainment and services within close proximity to existing and planned residential development. The ability to provide these opportunities in such close proximity to the residential development will limit the impacts on the infrastructure and services, include transportation. The addition of employment lands will have a positive effect on the economic, social and physical environment of Oregon City by providing employment opportunities in a region severely lacking those opportunities, increase the assessed value with

employment, office and commercial uses and providing a unique and urban physical environment that will be to the benefit of the residents of Oregon City.

The concept plan call for a mix of housing sizes and types, creating a truly mixed community that serves many income levels and demographics, which will improve the social environment of Oregon City. The compact urban development will also increase the opportunities for public transportation opportunities, potentially expanding the existing Tri-Met service from Clackamas Community College to the west of the site and providing an alternative to the single occupancy vehicle trip, thereby improving the economic and physical environment of Oregon City. For the foregoing reasons, this criterion is met.

III. CONCLUSION

For the reasons noted above, the City Commission has determined that the Applicant has met its burden of proof with respect to the Annexation and adopts Resolution No. 07-24 and set Proposal No. AN 07-02 for an election on November 6, 2007. The City Commission shall withdraw the territory from the County Service District for Enhanced Law Enforcement, Concur with Tri-City Service District's annexation of the subject property upon voter approval of the city annexation, will withdraw from the Clackamas County R.F.P.D #1 and Clackamas River Water District, will require all consenting property owners to sign a waiver of Measure 37 rights prior to the City Commission adopting a final ordinance accepting a positive annexation election result and shall accept the financial solution offered by the applicant to address the police funding shortcomings.


This map was prepared for assessment purpose only.
SW1/4 SEC. 10 T.3S. R.2E. W.M.
CLACKAMAS COUNTY
1"=200'
3 2E 10C
D.L.C.
ANDREW HOOD NO. 44
62-33
14900
15700
15900
19500
1/4 COR.
CENTER SEC. 10
(JOHN W.) LODER ROAD
COUNTY ROAD
S. LINE W. WILLIAMS DLC NO. 56
N. E. COR. HOOD D.L.C. NO. 44
62-64
City
BEAVERCREEK RD.
APPROX. 6 OF 50' NW PIPELINE EASEMENT
RRFF-5
Annexed Area
62-14
City
62-88
FU-10
TBR
Cancelled
TL 1217
1227
900
1000
1100
1101
1200 THRU 1226
:90
19800
SEE MAP 3 2E 90
SEE MAP 3 2E 10D
D.L.C.
ANDREW HOOD
LOT 4
LOT 3
LOT 1
28.50
30.00
62-
SEE MAP 3 2E 10CC
City
62-84
EAST LINE
GLEN OAK RD. CO. RD. NO. 881
62-64
SEE MAP 3 2E 15BB
1/4 COR.
20000
SEE MAP 3 2E 15A
3 2E 10C
BOOK 2E

3-276 CITY OF OREGON CITY: ANNEXATION OF 122 ACRES INTO CITY

VOTE FOR 1

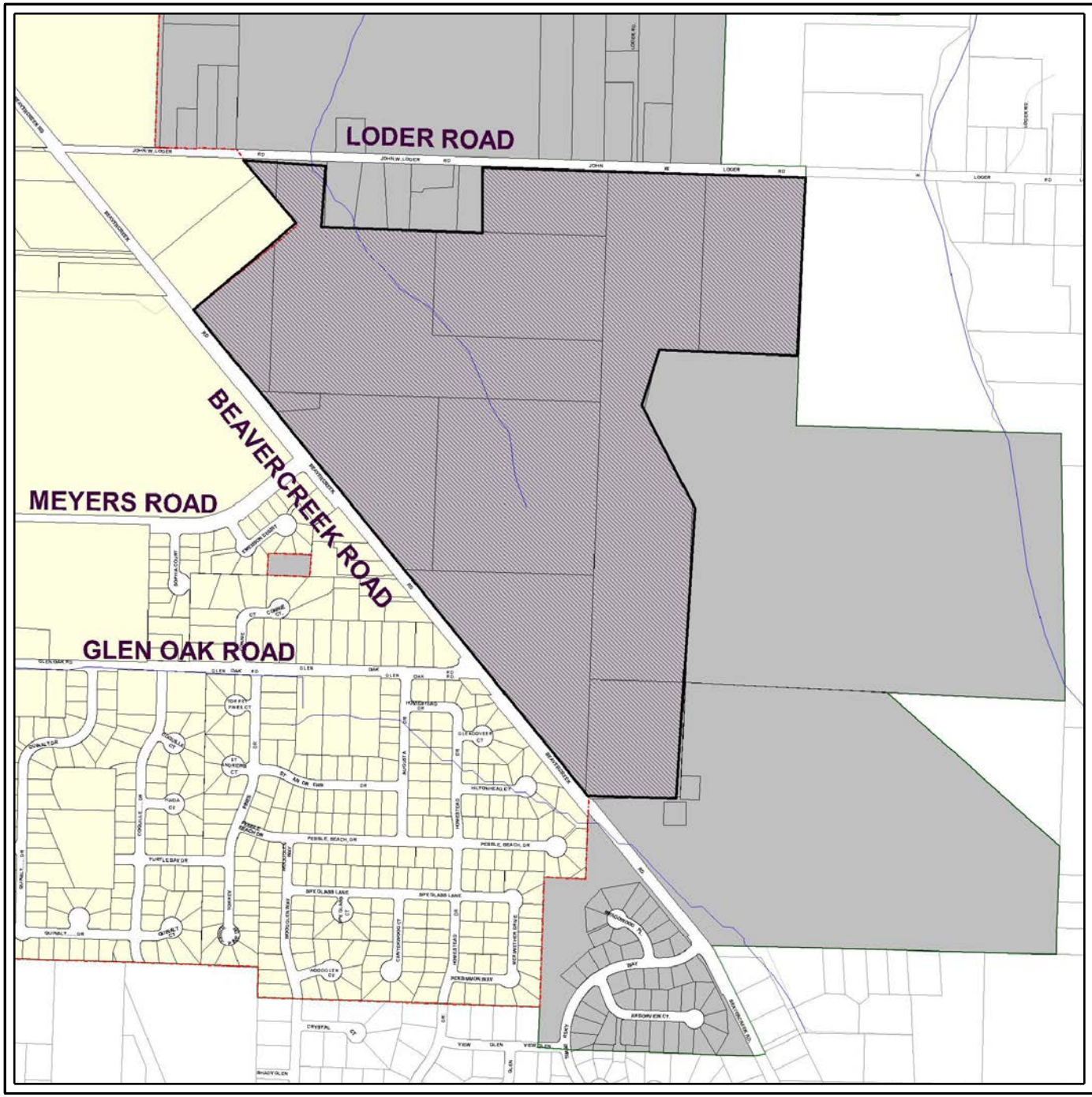
	VOTES	PERCENT		VOTES	PERCENT
01 = Yes	4,116	50.26	03 = OVER VOTES	0	
02 = No	4,073	49.74	04 = UNDER VOTES	620	

	01	02	03	04
0001 1	315	312	0	61
0002 2	324	343	0	67
0003 3	277	233	0	41
0005 5	263	233	0	50
0006 6	323	309	0	41
0007 7	642	677	0	100
0008 8	1207	1162	0	159
0009 9	359	350	0	48
0011 11	406	454	0	53

RECEIVED
NOV 26 2007
CITY RECORDER
CITY OF OREGON CITY, OR

CERTIFIED COPY OF THE ORIGINAL
SHERRY HALL, COUNTY CLERK
BY:
NOV 20 2007

AN 07-02



4

City of Oregon City
P.O. Box 3040
320 Warner Milne Rd
Oregon City, OR 97045
(503) 657-0891
www.orcity.org

Map created with OCMap 2006

05/29/2007

NOTICE OF HEARINGS

NOTICE IS HEREBY GIVEN THAT AT 7:00 PM ON MONDAY, JULY 16**,** 2007, IN THE CITY HALL COMMISSION CHAMBERS FOR OREGON CITY, 320 WARNER-MILNE ROAD, OREGON CITY, OREGON; THERE SHALL BE A PUBLIC HEARING BY AND BEFORE THE OREGON CITY **PLANNING COMMISSION** ON THE BOUNDARY CHANGE PROPOSAL LISTED BELOW.

NOTICE IS HEREBY ALSO GIVEN THAT AT 7:00 PM ON WEDNESDAY, AUGUST 1**,** 2007, IN THE CITY HALL COMMISSION CHAMBERS FOR OREGON CITY, 320 WARNER-MILNE ROAD, OREGON CITY, OREGON; THERE SHALL BE A PUBLIC HEARING BY AND BEFORE THE OREGON CITY **CITY COMMISSION** ON THE BOUNDARY CHANGE PROPOSAL LISTED BELOW.

INTERESTED PERSONS MAY APPEAR AT THESE HEARINGS AND WILL BE GIVEN REASONABLE OPPORTUNITY TO BE HEARD. INTERESTED PERSONS MAY ALSO SUBMIT WRITTEN COMMENTS ON THE PROPOSAL AT OR BEFORE THE HEARINGS.

PROPOSAL NO. AN 07-02 - ANNEXATION TO CITY OF OREGON CITY of territory located generally in the south east side of the City on the east side of Beavercreek Road, more particularly: Tax Lots 100, 101, 102, 200, 500, 570, 580, 700, 800, 801, 802, and 1228, in the SW 1/4 of Section 10 (10C); W.M., Clackamas County, Oregon.

The applicant desires to provide the properties with city services to eventually rezone some tax lots to accommodate a mixed use master planned community.

The decision on annexation to the City does not authorize or prevent any specific use of land. Current county zoning and planning designations will remain on the property until the City takes action to rezone the property.

Criteria for processing the annexations by the Planning and City Commission are found in Metro Code 3.09, Oregon City Municipal Code Title 14 (Ordinance 99-1030), the Land Use chapter of the Clackamas County Comprehensive Plan, the City / County Urban Growth Management Agreement, and Sections 11 and 14 of the Oregon City Comprehensive Plan. The Planning Commission will forward their recommendation for annexation to the City Commission who then decides whether to send it to the City voters for the final decision.

Any interested party may testify at the hearing or submit written comments on the proposals at or before the hearing. Staff reports will be available 15 days before the hearing. Any issue, which is intended to provide a basis for an appeal, 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 an opportunity to respond to the issue.

The applications and all supporting materials and evidence submitted in support of the applications may be inspected at no charge and copies may be obtained at reasonable cost.

General information and/or a copy of the staff reports may be obtained by calling Bob Cullison at 503 496-1561 or email at bcullison@ci.oregon-city.or.us.

JUNE 7, 2007 NANCY IDE, CITY RECORDER

ORDINANCE NO. 10-1012

AN ORDINANCE AMENDING A PORTION OF THE CITY'S COMPREHENSIVE PLAN MAP FROM COUNTY FU – FUTURE URBAN TO MUC - MIXED USE CORRIDOR AND TITLE 17: ZONING, CHAPTER 17.06.030: A PORTION OF THE OFFICIAL ZONING MAP, OF THE OREGON CITY MUNICIPAL CODE, FROM COUNTY - FU-10 TO MUC-1 – MIXED USE CORRIDOR DISTRICT FOR THE PROPERTY IDENTIFIED AS CLACKAMAS COUNTY MAP 3-2E-10C, TAX LOT 800.

WHEREAS, the City of Oregon City has adopted Comprehensive Plan and Zoning Maps to implement the Comprehensive Plan in conformance with statutory requirements and the requirements of the Statewide Land Use goals; and

WHEREAS, the City of Oregon City Comprehensive Plan and Zoning Maps may be amended and updated as necessary upon findings of facts that satisfy approval criteria in the City of Oregon City Municipal Code Section 17.68.020; and

WHEREAS, the owner of the subject site, identified as Clackamas County Map 3-2E-10-C, Tax Lot 800, has requested the approval of a Comprehensive Plan Amendment from Future Urban designation to MUC – Mixed Use Corridor designation, and a Zone Change from "County – FU-10" to "MUC-1" Mixed Use Corridor district, for a 9.6 acre parcel of land; and

WHEREAS, the proposed comprehensive plan designation of the site as MUC supports the Mixed Use Corridor District zoning designation, and

WHEREAS, the zone change from FU-10 District to MUC-1 is for a property that is has been located within the City's Urban Growth Boundary since 1979;

WHEREAS, the MUC-1 Zone meets the intent of the Comprehensive Plan Policies for mixed-use development, housing choices and increased density near activity centers and along the Beavercreek Road corridor;

WHEREAS, the subject property is not within the Metro Urban Growth Functional Management Plan Title 4 (Industrial and Employment Land) area that has been slated for redesignation out of Title 4 land on Metro's Urban Design Type Map; and therefore the City need not wait for the Title 4 map change before proceeding with the rezoning; and

WHEREAS, based on the demonstrated significant effect to the intersection at Highway 213/Meyers Road, before receiving building permits the applicant shall contribute a proportional share of funding for the construction of the westbound right turn lane at the OR 213/Meyers Rd intersection. The amount of the proportional share shall be determined based on a revised traffic impact analysis that will be submitted at the time a development application is submitted when the proposed uses are known; and

WHEREAS, the city considers the construction of the Meyers Road Extension between High School Ave and OR-213 by 2027 a reasonably likely improvement that will be demonstrate compliance with the Transportation Planning Rule (OAR 660-12-0060), and the project is identified in the City's capital improvement program and the city collects SDCs for this project's cost; and

WHEREAS, the projected transportation and public infrastructure impacts resulting from a zone change from FU-10 to MUC-1 Mixed Use Corridor District shall be required to comply with the specific Conditions of Approval and all applicable city regulations at the time a development is proposed on the property, and the applicant has demonstrated compliance with the Transportation System Plan, Public Infrastructure Master Plans and Oregon City Municipal Code; and

WHEREAS, notice of the proposed comprehensive plan map amendment and zone change was mailed to residents within 300 feet of the subject site and the Beavercreek Hamlet; and, in addition, signs were posted on the property, notice was published in a local newspaper and the City held public hearings where the objectives and concepts of the proposal were presented and discussed; and

WHEREAS, on August 30th, 2010, the Planning Commission held a public hearing and, after considering all the public testimony and reviewing all the evidence in the record, recommended approval of the requested comprehensive plan amendment and zone change (with conditions) to the City Commission by a 4 – 0 vote; and

WHEREAS, on October 6th, 2010, the City Commission held a public hearing and took testimony from the Hamlet of Beavercreek and subsequently extended the written comment period for 7 days to consider additional arguments; and

WHEREAS, on October 20th, 2010, the City Commission allowed additional testimony from the Hamlet of Beavercreek and voted not to consider a portion of the additional information submitted by the Hamlet concerning the finding that the construction of Meyers Road was reasonably likely to be constructed ; and

WHEREAS, on November 3rd, 2010, the City Commission, after considering all of the public testimony and written arguments, found that the application, as conditioned, met all of the applicable approval criteria for a comprehensive plan amendment and zone change; and

WHEREAS, approving the comprehensive plan amendment and zone change is in compliance with the Goals and Policies of the Oregon City Comprehensive Plan and as proposed and conditioned is in compliance with all applicable city requirements.

NOW, THEREFORE, OREGON CITY ORDAINS AS FOLLOWS:

Section 1. The requested comprehensive plan map amendment Comprehensive Plan Amendment from Future Urban designation to MUC – Mixed Use Corridor designation (PZ 10-1), and a Zone Change from "County – FU-10" to "MUC-1" Mixed Use Corridor district (ZC 10-1) are hereby approved as proposed by the applicant with conditions for the property identified as Clackamas County Map 3-2E-10C, Tax Lot 800 and the Comprehensive Plan Map and Zoning Map are hereby changed accordingly.

Section 2. The comprehensive plan amendment and zone change are approved as proposed by the applicant with the conditions of approval attached to this Ordinance as Attachment A, Exhibit 1.

Section 3. The Commission adopts the findings and conclusions from the August 30, 2010 Planning Commission staff report, included as Attachment A, Exhibit 2, and the

Supplemental Findings, dated October 26, 2010, included as Attachment A, Exhibit 3 and incorporated herein to support the City's approval to amend the comprehensive plan map and zoning map.

Read for the first time at a regular meeting of the City Commission held on the 3rd day of November 2010, and the City Commission finally enacted the foregoing ordinance this 3rd day of November 2010.

ALICE NORRIS, Mayor

Attested to this 3rd day of November 2010

Nancy Ide, City Recorder

Approved as to legal sufficiency:

City Attorney

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

11/16/2010

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 002-10

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: Tuesday, November 30, 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: Pete Walter, City of Oregon City
Gloria Gardiner, DLCD Urban Planning Specialist
Jennifer Donnelly, DLCD Regional Representative
Bill Holmstrom, DLCD Transportation Planner

<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

DATE STAMP
☐ In person ☐ electronic ☐ mailed
DEPT OF
NOV 10 2010
LAND CONSERVATION AND DEVELOPMENT
For Office Use Only

Jurisdiction: **CITY OF OREGON CITY** Local file number: **PZ 10-01 / ZC 10-01**

Date of Adoption: **11/3/2010** Date Mailed: **11/9/2010**

Was a Notice of Proposed Amendment (Form 1) mailed to DLCD? ☐ Yes ☐ No Date:

☐ Comprehensive Plan Text Amendment ☐ Comprehensive Plan Map Amendment

☐ Land Use Regulation Amendment ☐ Zoning Map Amendment

☐ New Land Use Regulation ☐ Other:

Summarize the adopted amendment. Do not use technical terms. Do not write "See Attached".

AMENDED THE CITY'S COMPREHENSIVE PLAN MAP FROM COUNTY FU – FUTURE URBAN TO MUC - MIXED USE CORRIDOR AND CHANGED THE CITY ZONING MAP FROM COUNTY - FU-10 TO MUC-1 – MIXED USE CORRIDOR DISTRICT FOR THE PROPERTY IDENTIFIED AS CLACKAMAS COUNTY MAP 3-2E-10C, TAX LOT 800. NO DEVELOPMENT IS PROPOSED AT THIS TIME.

Does the Adoption differ from proposal?

No, No explanation is neccessary

Plan Map Changed from: **COUNTY FU - FUTURE URBAN** to: **MUC - MIXED USE CORRIDOR**

Zone Map Changed from: **COUNTY – FU-10** to: **MUC-1 – MIXED USE CORRIDOR**

Location: **19896 Beavercreek Road, Oregon City, OR 97045** Acres Involved: **9.59**

Specify Density: Previous: **1 DWELLING** New: **NA – NO DEV. PROPOSED**

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. 002-10 (18401) [16405]

Please list all affected State or Federal Agencies, Local Governments or Special Districts:

OREGON DEPT OF TRANSPORTATION REGION #1, METRO, CLACKAMAS COUNTY, CLACKAMAS FIRE DISTRICT #1, CLACKAMAS RIVER WATER (CRW), OREGON CITY SCHOOL DISTRICT 62, TRI-COUNTY SERVICE DISTRICT (SEWER)

Local Contact: **PETE WALTER, AICP** Phone: **(503) 496-1568** Extension:

Address: **221 Molalla Ave, Suite 200** Fax Number: **503-722-3880**

City: **OREGON CITY, OR** Zip: **97045** E-mail Address: **pwalter@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.

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

November 9, 2010

FILE NO.: PZ 10-01: Comprehensive Plan Map Amendment
ZC 10-01: Zone Change

FILE TYPE: Type IV – Quasi-Judicial Land Use Decision

OWNER: Marylwood, LLC
Att: Phil Gentemann
7128 SW Gonzaga St
Portland, OR 97223

APPLICANT: Theta, LLC, Attn. Bruce Goldson
PO Box 1345
Lake Oswego, OR 97035

REQUEST: Approval of a Comprehensive Plan Map Amendment from County FU – Future Urban to MUC - Mixed Use Corridor and a Zoning Map Change from County - FU-10 To MUC-1 – Mixed Use Corridor District for the Property identified as Clackamas County Map 3-2E-10C, Tax Lot 800.

LOCATION: 19896 Beavercreek Road
Clackamas County Map 3-2E-10C, Tax Lot 800

IN-HOUSE DISTRIBUTION	MAIL-OUT DISTRIBUTION
☑ Building Official	☑ Citizen Involvement Council (CIC)
☑ Development Services Manager	☑ County CPOs Beavercreek Hamlet
☑ Public Works	☑ Neighborhood Association Chair
☑ City Engineer/Public Works Director	☑ Neighborhood Association land Use Chair
☑ Geotechnical Services (GIS)	☑ Fire Marshal
☑ Parks Manager	☑ Clackamas County – Joe Marek
☐ Addressing	☑ Clackamas County – Ken Kent
	☑ School District# 62
	☑ Tri-Met
	☑ Oregon Dept. of Transportation - ~~Sonya Kazen~~ Div. Review
	☐ ~~Oregon Dept. of Transportation – Loretta Kiefer~~
	☑ DLCD
	☑ Metro
	☐ Other:

Public Testimony:
Christine Kosinski
Elisabeth Graser-Lindsay

Tom O'Brien

CONDITIONS OF APPROVAL

Planning Files: PZ 10-01 / ZC 10-01

1. The Applicant is responsible for this project's compliance with Engineering Policy 00-01. The policy pertains to any land use decision requiring the Applicant to provide any public improvements.
2. Public facilities/infrastructure locations shall be provided as determined by the future development's conditions of approval.
3. Future developments shall obtain the appropriate Erosion Prevention and Sedimentation Control permit(s) at the time of construction plan submittal.
4. Based on the demonstrated significant effect to the intersection at Highway 213/Meyers Road, before receiving building permits the applicant shall contribute a proportional share of funding for the construction of the westbound right turn lane at the OR 213/Meyers Rd intersection. The amount of the proportional share shall be determined based on a revised traffic impact analysis that will be submitted at the time a development application is submitted when the proposed uses are known.
5. If the Beavercreek Road Concept Plan (BRCP) is formally adopted subsequent to approval of the proposed rezoning, as part of any subsequent site plan design review approval, master plan, phased development review, or other appropriate review, the development shall comply with the BCRP, and any design and performance standards adopted thereto.
6. If the Beavercreek Road Concept Plan is not yet adopted at the time the applicant seeks development approval, the applicant's proposal shall be consistent with the intent and purpose of the Mixed Employment Village, which is to provide retail, office, civic and residential uses in an urban, pedestrian friendly and mixed use setting that is transit supportive in its use, density and design. Development shall create an active urban environment that incorporates pedestrian-friendly amenities, urban building design consistent with the Beavercreek Road Concept Plan and cost effective green development practices. At a minimum, the overall development site shall achieve an average minimum floor area ratio (FAR) of 0.25 and a minimum building height of thirty-four feet except for accessory structures or buildings under one thousand square feet. The applicant may seek to modify these standards through the master plan adjustment or variance process with city approval.
7. In accordance with OCMC 17.29.070, the 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. An individual phase of a project approved through the Master Plan process OCMC 17.65 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, including phased development, that the required density for the project will be achieved at project build-out.

ORDINANCE NO. 10-1012

AN ORDINANCE AMENDING A PORTION OF THE CITY'S COMPREHENSIVE PLAN MAP FROM COUNTY FU – FUTURE URBAN TO MUC - MIXED USE CORRIDOR AND TITLE 17: ZONING, CHAPTER 17.06.030: A PORTION OF THE OFFICIAL ZONING MAP, OF THE OREGON CITY MUNICIPAL CODE, FROM COUNTY - FU-10 TO MUC-1 – MIXED USE CORRIDOR DISTRICT FOR THE PROPERTY IDENTIFIED AS CLACKAMAS COUNTY MAP 3-2E-10C, TAX LOT 800.

WHEREAS, the City of Oregon City has adopted Comprehensive Plan and Zoning Maps to implement the Comprehensive Plan in conformance with statutory requirements and the requirements of the Statewide Land Use goals; and

WHEREAS, the City of Oregon City Comprehensive Plan and Zoning Maps may be amended and updated as necessary upon findings of facts that satisfy approval criteria in the City of Oregon City Municipal Code Section 17.68.020; and

WHEREAS, the owner of the subject site, identified as Clackamas County Map 3-2E-10-C, Tax Lot 800, has requested the approval of a Comprehensive Plan Amendment from Future Urban designation to MUC – Mixed Use Corridor designation, and a Zone Change from "County – FU-10" to "MUC-1" Mixed Use Corridor district, for a 9.6 acre parcel of land; and

WHEREAS, the proposed comprehensive plan designation of the site as MUC supports the Mixed Use Corridor District zoning designation, and

WHEREAS, the zone change from FU-10 District to MUC-1 is for a property that is has been located within the City's Urban Growth Boundary since 1979;

WHEREAS, the MUC-1 Zone meets the intent of the Comprehensive Plan Policies for mixed-use development, housing choices and increased density near activity centers and along the Beavercreek Road corridor;

WHEREAS, the subject property is not within the Metro Urban Growth Functional Management Plan Title 4 (Industrial and Employment Land) area that has been slated for redesignation out of Title 4 land on Metro's Urban Design Type Map; and therefore the City need not wait for the Title 4 map change before proceeding with the rezoning; and

WHEREAS, based on the demonstrated significant effect to the intersection at Highway 213/Meyers Road, before receiving building permits the applicant shall contribute a proportional share of funding for the construction of the westbound right turn lane at the OR 213/Meyers Rd intersection. The amount of the proportional share shall be determined based on a revised traffic impact analysis that will be submitted at the time a development application is submitted when the proposed uses are known; and

WHEREAS, the city considers the construction of the Meyers Road Extension between High School Ave and OR-213 by 2027 a reasonably likely improvement that will be demonstrate compliance with the Transportation Planning Rule (OAR 660-12-0060), and the project is identified in the City's capital improvement program and the city collects SDCs for this project's cost; and

WHEREAS, the projected transportation and public infrastructure impacts resulting from a zone change from FU-10 to MUC-1 Mixed Use Corridor District shall be required to comply with the specific Conditions of Approval and all applicable city regulations at the time a development is proposed on the property, and the applicant has demonstrated compliance with the Transportation System Plan, Public Infrastructure Master Plans and Oregon City Municipal Code; and

WHEREAS, notice of the proposed comprehensive plan map amendment and zone change was mailed to residents within 300 feet of the subject site and the Beavercreek Hamlet; and, in addition, signs were posted on the property, notice was published in a local newspaper and the City held public hearings where the objectives and concepts of the proposal were presented and discussed; and

WHEREAS, on August 30th, 2010, the Planning Commission held a public hearing and, after considering all the public testimony and reviewing all the evidence in the record, recommended approval of the requested comprehensive plan amendment and zone change (with conditions) to the City Commission by a 4 – 0 vote; and

WHEREAS, on October 6th, 2010, the City Commission held a public hearing and took testimony from the Hamlet of Beavercreek and subsequently extended the written comment period for 7 days to consider additional arguments; and

WHEREAS, on October 20th, 2010, the City Commission allowed additional testimony from the Hamlet of Beavercreek and voted not to consider a portion of the additional information submitted by the Hamlet concerning the finding that the construction of Meyers Road was reasonably likely to be constructed ; and

WHEREAS, on November 3rd, 2010, the City Commission, after considering all of the public testimony and written arguments, found that the application, as conditioned, met all of the applicable approval criteria for a comprehensive plan amendment and zone change; and

WHEREAS, approving the comprehensive plan amendment and zone change is in compliance with the Goals and Policies of the Oregon City Comprehensive Plan and as proposed and conditioned is in compliance with all applicable city requirements.

NOW, THEREFORE, OREGON CITY ORDAINS AS FOLLOWS:

Section 1. The requested comprehensive plan map amendment Comprehensive Plan Amendment from Future Urban designation to MUC – Mixed Use Corridor designation (PZ 10-1), and a Zone Change from "County – FU-10" to "MUC-1" Mixed Use Corridor district (ZC 10-1) are hereby approved as proposed by the applicant with conditions for the property identified as Clackamas County Map 3-2E-10C, Tax Lot 800 and the Comprehensive Plan Map and Zoning Map are hereby changed accordingly.

Section 2. The comprehensive plan amendment and zone change are approved as proposed by the applicant with the conditions of approval attached to this Ordinance as Attachment A, Exhibit 1.

Section 3. The Commission adopts the findings and conclusions from the August 30, 2010 Planning Commission staff report, included as Attachment A, Exhibit 2, and the

Supplemental Findings, dated October 26, 2010, included as Attachment A, Exhibit 3 and incorporated herein to support the City's approval to amend the comprehensive plan map and zoning map.

Read for the first time at a regular meeting of the City Commission held on the 3rd day of November 2010, and the City Commission finally enacted the foregoing ordinance this 3rd day of November 2010.

ALICE NORRIS, Mayor

Attested to this 3rd day of November 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 LAND USE DECISION

PZ 10-01, ZC 10-01

DATE OF MAILING OF NOTICE OF DECISION: November 9th, 2010

OWNERS: Marylwood, LLC
Att: Phil Gentemann
7128 SW Gonzaga St
Portland, OR 97223

APPLICANT: Theta, LLC
PO Box 1345
Lake Oswego, OR 97035

REQUEST: Approval of a Comprehensive Plan Map Amendment from County FU – Future Urban to MUC - Mixed Use Corridor and a Zoning Map Change from County - FU-10 To MUC-1 – Mixed Use Corridor District for the Property identified as Clackamas County Map 3-2E-10C, Tax Lot 800.

LOCATION: 19896 Beavercreek Road
Clackamas County Map 3-2E-10C, Tax Lot 800

CONTACT: Pete Walter, AICP, Associate Planner

DECISION: On November 3rd, 2010, after reviewing all of the evidence in the record and considering all of the arguments made by the applicant, opposing and interested parties, the City Commission voted 5-0 to approve with conditions the requested Comprehensive Plan Map amendment and Zone Change. Accordingly, the City Commission adopted as its own the Staff Report, Supplementary Findings and Conditions of Approval for File Numbers PZ 10-01 and ZC 10-01 and approved Ordinance Number 10-1012.

PROCESS: 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. 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) 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.

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.

CONDITIONS OF APPROVAL

Planning Files: PZ 10-01 / ZC 10-01

1. The Applicant is responsible for this project's compliance with Engineering Policy 00-01. The policy pertains to any land use decision requiring the Applicant to provide any public improvements.
2. Public facilities/infrastructure locations shall be provided as determined by the future development's conditions of approval.
3. Future developments shall obtain the appropriate Erosion Prevention and Sedimentation Control permit(s) at the time of construction plan submittal.
4. Based on the demonstrated significant effect to the intersection at Highway 213/Meyers Road, before receiving building permits the applicant shall contribute a proportional share of funding for the construction of the westbound right turn lane at the OR 213/Meyers Rd intersection. The amount of the proportional share shall be determined based on a revised traffic impact analysis that will be submitted at the time a development application is submitted when the proposed uses are known.
5. If the Beavercreek Road Concept Plan (BRCP) is formally adopted subsequent to approval of the proposed rezoning, as part of any subsequent site plan design review approval, master plan, phased development review, or other appropriate review, the development shall comply with the BCRP, and any design and performance standards adopted thereto.
6. If the Beavercreek Road Concept Plan is not yet adopted at the time the applicant seeks development approval, the applicant's proposal shall be consistent with the intent and purpose of the Mixed Employment Village, which is to provide retail, office, civic and residential uses in an urban, pedestrian friendly and mixed use setting that is transit supportive in its use, density and design. Development shall create an active urban environment that incorporates pedestrian-friendly amenities, urban building design consistent with the Beavercreek Road Concept Plan and cost effective green development practices. At a minimum, the overall development site shall achieve an average minimum floor area ratio (FAR) of 0.25 and a minimum building height of thirty-four feet except for accessory structures or buildings under one thousand square feet. The applicant may seek to modify these standards through the master plan adjustment or variance process with city approval.
7. In accordance with OCMC 17.29.070, the 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. An individual phase of a project approved through the Master Plan process OCMC 17.65 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, including phased development, that the required density for the project will be achieved at project build-out.

From: Andrew Brand
To: Pete Walter
Subject: Re: Status Update on SP 14-01? 120-day Deadline
Date: Wednesday, September 10, 2014 4:03:24 PM
Attachments: image001.png

Pete,

Yes, I would like to ask for an extension to February 4th. Thank you.

Sincerely,

Andrew Brand
Director of Development
Evergreen Housing Development Group, LLC
600 University St, Suite 1708
Seattle, WA 98101
206-535-6248 x 101
andrew@evergreenhd.com

From: Pete Walter <pwalter@ci.oregon-city.or.us>
Date: Wednesday, September 10, 2014 3:54 PM
To: Andrew Brand <andrew@evergreenhd.com>
Subject: RE: Status Update on SP 14-01? 120-day Deadline

Andrew,

You will need to grant an extension of the 120-day deadline to February 4 if you want us to do that, since that is the date of the City Commission meeting. Right now we are maxed out at Jan 7.

Pete

From: Andrew Brand [mailto:andrew@evergreenhd.com]
Sent: Wednesday, September 10, 2014 10:53 AM
To: Pete Walter
Subject: Re: Status Update on SP 14-01? 120-day Deadline

Pete,

I'd like to move the Notice for additional comment back to October 17th. Please let me know if this e-mail is enough to do that or if I need to submit another type of request.

Sincerely,

Andrew Brand