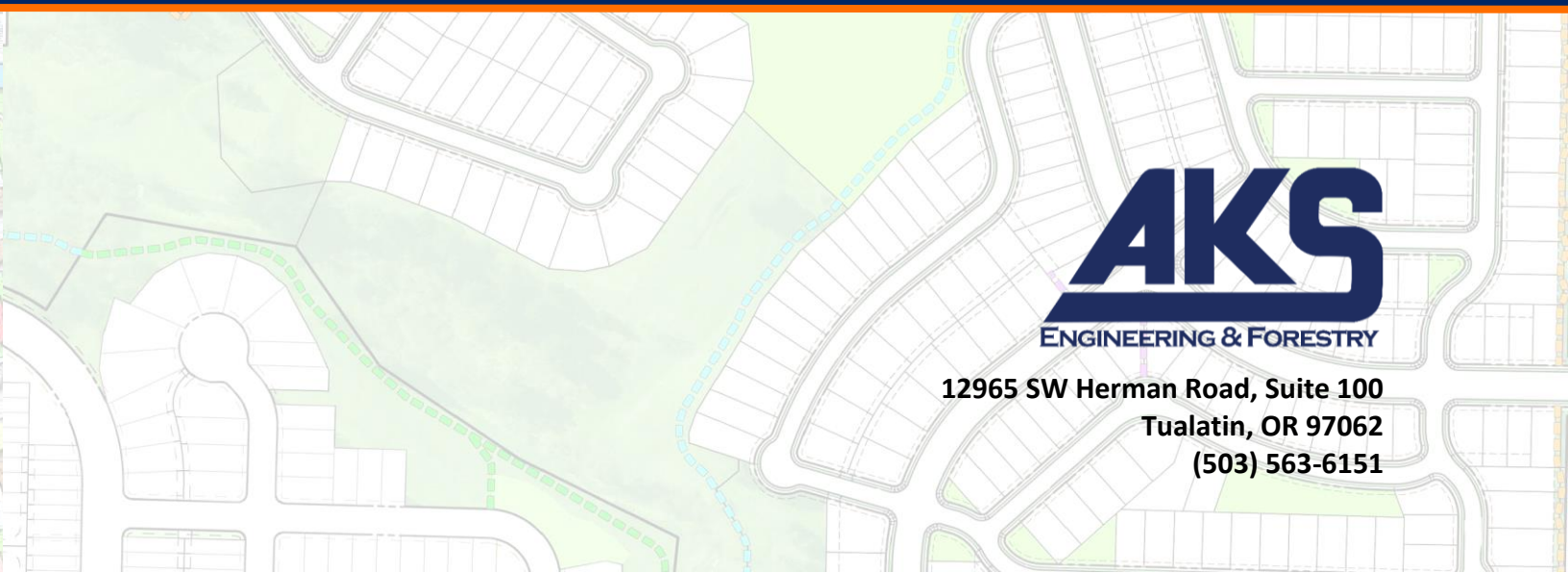
Land Use Application
For
Wheeler Farms Subdivision

Date: June 2017

Submitted to:
City of Oregon City
Planning Division
221 Molalla Avenue
Oregon City, OR 97045

Owners:
Wheeler Family Enterprises, LLC
David H. Wheeler Sr. Trust
Donald W. & Roxanne O. Wheeler

Applicant:
Rian Park Development, Inc.
PO Box 2559
Oregon City, OR 97045



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Land Use Application
For
Wheeler Farms Subdivision

Submitted to:	City of Oregon City Planning Division 221 Molalla Avenue, Suite 200 Oregon City, OR 97045
Owners:	Map 32E07C Tax Lot 1001 (Wheeler Family Enterprises, LLC) Map 32E07C Tax Lots 1100, 1180 (David H. Wheeler Sr. Trust) Map 32E07C Tax Lot 1291 (Donald W. & Roxanne O. Wheeler) Map 31E12D Tax Lots 1700, 1790 (Wheeler Family Enterprises, LLC)
Applicant:	Rian Park Development, Inc. PO Box 2559 Oregon City, OR 97045
Applicant's Consultant:	AKS Engineering & Forestry, LLC 12965 SW Herman Road, Suite 100 Tualatin, OR 97062 Contact(s): Monty Hurley (monty@aks-eng.com) Chris Goodell, (chrisg@aks-eng.com) Phone: (503) 563-6151 Fax: (503) 563-6152
Clackamas County Assessor's Information:	Tax Map: 32E07C, Tax Lots: 1001, 1100, 1180, & 1291 Tax Map: 31E12D, Tax Lots: 1700 & 1790
Site Size:	±22.56 Acres
Land Use Districts:	R-8 Single-Family Dwelling District

I. Executive Summary

On behalf of Rian Park Development, Inc. (applicant), AKS Engineering & Forestry, LLC is submitting this application for a 77-lot subdivision (Wheeler Farms) in the City of Oregon City for the future construction of single-family detached residential homes. The project includes the necessary streets, sidewalks, services, utilities, and other needed public improvements to support the project.

The essential components of this application include:

- 77 lots that meet the dimensional and density standards of the R-8 zone
- A voluntary 1.35-acre open space area
- An interconnected pedestrian and vehicular circulation system
- Creation of a cohesive neighborhood with the continuation of Orchard Grove Drive, Larence Lane, Skellenger Way, and Tolstrup Drive through the project site
- An integrated on-site stormwater management system including street side vegetated filtration swales and flow control
- An approximately ±1.3-acre remainder property to be incorporated into the abutting Wheeler property located off-site to the southeast

II. Site Description/Setting

The project includes six tax lots that comprise a total of approximately ±22.56 acres that are in process of being rezoned from R-10 to R-8 through a separate land use application to provide a community consistent with the density of surrounding residential projects. The project site is generally located south of the Ed's Orchard Subdivision, west of the Hazel Creek Farms Subdivision, east of the Highland Park Subdivision. The subject site is also north of the abutting Urban Growth Boundary. The subject properties have been historically used as a hazelnut orchard and Christmas tree farm. There are no designated or identified wetlands or perennial streams on the project site as verified through a previous Type I NROD Verification application.

III. Applicable Review Criteria

OREGON CITY MUNICIPAL CODE

Title 10 - VEHICLES AND TRAFFIC

Chapter 10.32 - TRAFFIC SIGHT OBSTRUCTIONS

10.32.020 Definitions.

"Clear vision area" means a triangular area at the intersection of two streets or a street and a railroad, the area of which is to be determined by the city engineer or his designee, using the following criteria:

1. **Type of intersection;**
2. **Site characteristics;**
3. **Types of vehicle controls;**
4. **Vehicle speed;**
5. **Traffic volume;**
6. **Suggested intersection sight distances prescribed in the Transportation and Traffic Engineering Handbook published by the Institute of Traffic Engineers, 1976 Edition, as follows:**

Corner Sight Distance Table						
Speed Limit:	20	25	30	35	40	45
Sight Distance:	200	250	300	350	400	450

Corner sight distance is measured from a point on the center line of the minor road at least fifteen feet from the edge of the major road pavement and measured from a height of eye of three and seventy-five hundredths feet on the minor road to a height of object of four and five-tenths feet on the major road. The clear vision area is in the form of a triangle, two sides of which are lot lines measured from the corner intersection of the street lines. Where the lot lines have rounded corners, the lot lines are extended in a straight line to a point of intersection. The third side of the clear vision area is a line across the corner of the lot joining the nonintersecting ends of the other two sides.

Response: Clear vision areas are planned to be maintained at intersections in accordance with the applicable standards. These criteria are met.

10.32.030 Sight line requirements

A clear vision area shall contain no vegetation or fences or other artificial obstruction exceeding three feet in height measured from the top of the curb or, where no curb exists, from the established street center line grade, except that trees exceeding this height may be located in this area provided all branches and foliage are removed to a height of eight feet above the grade.

Response: Clear vision areas will contain no vegetation, fences, or other obstructions exceeding 3 feet in height, except for allowed trees branched up to 8 feet in height. This standard is met.

Title 12 - STREETS, SIDEWALKS AND PUBLIC PLACES

Chapter 12.04 - STREETS, SIDEWALKS AND PUBLIC PLACES

12.04.003 Applicability.

A. Compliance with this chapter is required for all land divisions, site plan and design review, master plan, detailed development plan and conditional use applications and all public improvements.

B. Compliance with this chapter is also required for new construction or additions which exceed fifty percent of the existing square footage, of all single and two-family dwellings. All applicable single and two-family dwellings shall provide any necessary dedications, easements or agreements as identified in the transportation system plan and this chapter. In addition, the frontage of the site shall comply with the following prioritized standards identified in this chapter:

1. Improve street pavement, construct curbs, gutters, sidewalks and planter strips; and

2. Plant street trees.

The cost of compliance with the standards identified in 12.04.003.B.1 and 12.04.003.B.2 is limited to ten percent of the total construction costs. The value of the alterations and improvements as determined by the community development director is based on the entire project and not individual building permits. It is the responsibility of the applicant to submit to the community development director the value of the required improvements. Additional costs may be required to comply with other applicable requirements associated with the proposal such as access or landscaping requirements.

RESPONSE: The Wheeler Farms Subdivision will comply with the provisions of this chapter, as shown in the response to the approval criteria in this narrative. Street improvements and street trees will comply with the standards of the Oregon City Municipal Code, addressed later in this narrative.

12.04.005 Jurisdiction and management of the public rights-of-way.

A. The city has jurisdiction and exercises regulatory management over all public rights-of-way within the city under authority of the City Charter and state law by issuing separate public works right-of-way permits or permits as part of issued public infrastructure construction plans. No work in the public right-of-way shall be done without the proper permit. Some public rights-of-way within the city are regulated by the State of Oregon Department of Transportation (ODOT) or Clackamas County and as such, any work in these streets shall conform to their respective permitting requirements.

B. Public rights-of-way include, but are not limited to, streets, roads, highways, bridges, alleys, sidewalks, trails, paths, public easements and all other public ways or areas, including the subsurface under and air space over these areas.

C. The city has jurisdiction and exercises regulatory management over each public right-of-way whether the city has a fee, easement, or other legal interest in the right-of-way. The city has jurisdiction and regulatory management of each right-of-way whether the legal interest in the right-of-way was obtained by grant, dedication, prescription, reservation, condemnation, annexation, foreclosure or other means.

D. No person may occupy or encroach on a public right-of-way without the permission of the city. The city grants permission to use rights-of-way by franchises, licenses and permits.

E. The exercise of jurisdiction and regulatory management of a public right-of-way by the city is not official acceptance of the right-of-way, and does not obligate the city to maintain or repair any part of the right-of-way.

RESPONSE: The applicant understands that the City has jurisdictional management over the future public rights-of-way within the Wheeler Farms Subdivision.

12.04.007 Modifications.

The review body may consider modification of this standard resulting from constitutional limitations restricting the city's ability to require the dedication of property or for any other reason, based upon the criteria listed below and other criteria identified in the standard to be modified. All modifications shall be processed

through a Type II Land Use application and may require additional evidence from a transportation engineer or others to verify compliance. Compliance with the following criteria is required:

Response: This application includes two modifications to the standards of Section 12.04 Streets, Sidewalks and Public Places.

Modification 1:

Subsection 12.04.195 Spacing standards, requires that all blocks have a maximum block spacing of 530 feet between streets. A pedestrian accessway must be provided every 330 feet if a block exceeds the maximum spacing of 530 feet. The "island" block created by extending Skellenger Way and Tolstrup Drive through the project between Hazel Creek Drive, and the planned extension of Orchard Grove Drive, exceeds the maximum block length standard of 530 feet by approximately ±26 feet (±556 feet) when considered with the relevant portion of the Ed's Orchard Subdivision to the north. City staff have suggested in the updated Pre-Application Conference Summary, dated December 28, 2016, that the applicant request a waiver for the requirement for a mid-block pedestrian path. Therefore, the following modification standards are addressed.

Modification 2:

Subsection 12.04.225 Street design–Cul-de-sacs and dead-end streets, requires cul-de-sacs to be no greater than 200 feet in length measured from the right-of-way line of the nearest intersecting street to the back of the cul-de-sac curb face. The planned cul-de-sac in the southeast portion of the project will exceed the maximum 200-foot length standard by approximately ±89 feet due to the project's unique circumstances (adjacent to the Urban Growth Boundary (UGB), and the existing Portland General Electric (PGE) easement running through the southeast end of the project). The following standards are applicable to the necessary modification to exceed the maximum 200-foot length criterion of Subsection 12.04.225.

A. The modification meets the intent of the standard;

Response: **Modification 1:**

The intent of requiring a midblock pedestrian connection through blocks exceeding the maximum spacing of 530 feet is to minimize pedestrian travel times, and provide safe, and convenient access to local amenities.

As shown in the preliminary plans, the project includes a voluntary ±1.35 acre open space tract (Tract A), which is considered the primary pedestrian destination within the project. Tract A is approximately ±0.2 miles from the intersection of Hazel Creek Drive and Tolstrup Drive, the furthest point of the "island" block from Tract A. According to Industry standards, most walking trips are less than ±0.5 miles. Because the greatest distance required to travel from the "island" block to Tract A is within an acceptable limit, the small amount that the "island" block exceeds the standard (±26 feet), coupled with the small number of future residents a midblock pedestrian connection would serve, the benefits do not justify the construction and future maintenance of such a walkway. In addition, a midblock pedestrian connection between Tolstrup Drive and Skellenger Way through the "island" block would still require residents to travel a maximum distance of ±0.2 miles to the project's open space tract (Tract A).

Potential pedestrian trips from the project to the nearest collector street (South Central Point Road) are also below the ±0.5-mile acceptable walking trip distance. Because this project includes the extension of existing street patterns, future residents will have multiple travel options to South Central Point Road including, Hazeldell Drive, Tolstrup Drive, Skellenger Way, Blanchet Drive, and White Lane. A midblock pedestrian connection through the" island" block will serve no benefit to future residents accessing South Central Point Road.

Modification 2:

As mentioned previously, the modification to exceed the maximum 200-foot length standard by approximately ±89 feet is due to the project's unique circumstances (adjacent to the Urban Growth Boundary (UGB), and the existing Portland General Electric (PGE) easement running through the southeast end of the project). Other than the length, the planned cul-de-sac has been designed with sufficient radius to provide adequate turn-around for emergency vehicles, meet minimum dimensional requirements, and provide access to no more than 25 dwelling units, which meets the intent of Subsection 12.04.225.

B. The modification provides safe and efficient movement of pedestrians, motor vehicles, bicyclists and freight;

Response:

Modification 1:

This project includes fully improved streets, including 5-foot wide sidewalks behind 5-foot wide planter strips, ADA compliant curb ramps, and appropriately marked street crossings, creating an open, safe, and inviting walking environment to both the interior of the project and to South Central Point Road. Historically, midblock pedestrian connections have been areas of low visibility, high maintenance, and are disruptive to adjoining property owners. The benefits of a mid-block pedestrian connection between Tolstrup Drive and Skellenger Way through the "island" block to alleviate future residents from having to walk an extra ±26 feet does not justify the construction and maintenance of such a walkway. Therefore, it can be concluded that the planned sidewalk improvements within the project provide safe and efficient movement of pedestrians to areas of interest.

Modification 2:

As shown on the preliminary plans, the planned cul-de-sac has been designed with 5-foot wide sidewalks behind 5-foot wide planter strips, sufficient radius to provide adequate turn-around for emergency vehicles and other motor vehicles, and meet minimum dimensional requirements. The necessary modification to exceed the maximum allowable cul-de-sac length of 200 feet will not affect the efficient movement of pedestrians, motor vehicles, bicyclists, and freight using the planned cul-de-sac. This criterion is met.

C. The modification is consistent with an adopted plan; and

Response: **Modification 1:**

Oregon City's Transportation System Plan (TSP) addresses maximum public street spacing standards and the need for sufficiently spaced pedestrian crossings. However, the TSP does not account for infill projects that extend existing street patterns of adjoining projects that create blocks that exceed the maximum street spacing standards, which would otherwise meet the standard. Therefore, the necessary modification to exceed the maximum street spacing standards of Subsection 12.04.195 does not conflict with City's TSP. The requested modification is the least needed to alleviate the construction of unnecessary infrastructure based on the minimal distance the "island" block exceeds the standard, and the number of future residents served.

Modification 2:

Oregon City's TSP limits the use of cul-de-sacs to situations where barriers prevent full street connections. The TSP also limits cul-de-sacs to a maximum length of 200 feet. Based on the irregular shape of the project area, its location adjacent to the Urban Growth Boundary (UGB), and the Portland General Electric (PGE) easement running through the site, the modification to exceed the maximum cul-de-sac length of 200 feet is necessary to provide adequate access to planned lots within the subdivision. Allowing a modification to Title 12 – Streets, Sidewalks and Public Places, coupled with the unique circumstances of the project site, while meeting housing needs within City limits, will not violate the City's TSP. No other plans have been adopted that effect the project area. This criterion is met.

D. The modification is complementary with a surrounding street design; or, in the alternative;

Response: **Modification 1:**

The maximum street spacing standards of Subsection 12.04.195 require a midblock pedestrian connection within the project's "island" block between Tolstrup Drive and Skellenger Way. This modification compliments surrounding street design by extending sidewalks along the project's internal streets to direct pedestrian traffic along pedestrian-specific routes that have been designed to capture pedestrian traffic in a controlled, safe, and vibrant pedestrian environment that does not have a negative effect on lots within the "island" block or their future owners.

Modification 2:

The modification to exceed the maximum cul-de-sac length of 200 feet by approximately ±89 feet compliments the irregular shape of the project area, and is the minimum modification needed based on its location adjacent to the UGB, and the PGE easement running through the project area. The necessary modification will have no impact on surrounding street design.

E. If a modification is requested for constitutional reasons, the applicant shall demonstrate the constitutional provision or provisions to be avoided by the modification and propose a modification that complies with the state or federal constitution. The city shall be under no obligation to grant a modification in excess of that which is necessary to meet its constitutional obligations.

Response: Modifying the street spacing standards of Subsection 12.04.195 and maximum cul-de-sac length standards of Subsection 12.04.225 are necessary based on existing street patterns of adjacent projects, the irregular shape of the project area, its location adjacent to the UGB, and the PGE easement running through the project area. The modification is not for constitutional reasons.

> **12.04.010 Construction specifications—Improved streets.**
>
> All sidewalks hereafter constructed in the city on improved streets shall be constructed to city standards and widths required in the Oregon City Transportation System Plan. The curb shall be constructed at the same time as the construction of the sidewalk and shall be located as provided in the ordinance authorizing the improvement of said street next proceeding unless otherwise ordered by the city commission. Both sidewalks and curbs are to be constructed according to plans and specifications provided by the city engineer.

Response: All future sidewalks within the Wheeler Farms Subdivision will comply with City construction specifications. This standard will be met.

> **12.04.020 Construction specifications—Unimproved streets.**
>
> Sidewalks constructed on unimproved streets shall be constructed of concrete according to lines and grades established by the city engineer and approved by the city commission. On unimproved streets curbs do not have to be constructed at the same time as the sidewalk.

Response: The project includes the extension and improvement of Orchard Grove Drive, which is currently unimproved on the street's south side. Planned improvements to Orchard Grove Drive include additional dedication of right-of-way and a half-street improvement, which includes sidewalks. Additional right-of-way is to be dedicated at the southwest boundary of the project for the future extension of White Lane. However, a fee-in-lieu of constructing any improvements has been found to be acceptable by City staff. Therefore, this standard has been met.

> **12.04.025 Street design—Driveway curb cuts.**
>
> **A.** One driveway shall be allowed per frontage. In no case shall more than two driveways be allowed on any single or two-family residential property with multiple frontages.
>
> **B.** With the exception of the limitations identified in 12.04.025.C, all driveway curb cuts shall be limited to the following dimensions.

Property Use	Minimum Driveway Width at sidewalk or property line	Maximum Driveway Width at sidewalk or property line
Single or two-family dwelling with one car garage/parking space	10 feet	12 feet
Single or two-family dwelling with two car garage/parking space	12 feet	24 feet
Single or two-family dwelling with three or more car garages/parking space	18 feet	30 feet

The driveway width abutting the street pavement may be extended three feet on either side of the driveway to accommodate turn movements. Driveways may be widened onsite in locations other than where the driveway meets sidewalk or property line (for example between the property line and the entrance to a garage).

(***)

E. Exceptions. The public works director reserves the right to waive this standard, if it is determined through a Type II decision including written findings that it is in the best interest of the public to do so.

Response: All future homes within the project are planned to be constructed with no more than one driveway per home. Driveway widths will comply with the above-listed requirements in relation to the sizes of garages or parking spaces. This standard is met.

12.04.030 Maintenance and repair.
The owner of land abutting the street where a sidewalk has been constructed shall be responsible for maintaining said sidewalk and abutting curb, if any, in good repair.

Response: All future home owners within the project are to be responsible for maintaining sidewalks and abutting curbs along their frontage. This standard is understood.

12.04.031 Liability for sidewalk injuries.

A. The owner or occupant of real property responsible for maintaining the adjacent sidewalk shall be liable to any person injured because of negligence of such owner or occupant in failing to maintain the sidewalk in good condition.

B. If the city is required to pay damages for an injury to persons or property caused by the failure of a person to perform the duty that this ordinance imposes, the person shall compensate the city for the amount of the damages paid. The city may maintain an action in a court of competent jurisdiction to enforce this section.

Response: All future home owners within the project are to be responsible for maintaining sidewalks and abutting curbs along their frontage. This standard is understood.

12.04.032 Required sidewalk repair.

A. When the public works director determines that repair of a sidewalk is necessary he or she shall Issue a notice to the owner of property adjacent to the sidewalk.

B. The notice shall require the owner of the property adjacent to the defective sidewalk to complete the repair of the sidewalk within ninety days after the service of notice. The notice shall also state that if the repair is not made by the owner, the city may do the work and the cost of the work shall be assessed against the property adjacent to the sidewalk.

C. The public works director shall cause a copy of the notice to be served personally upon the owner of the property adjacent to the defective sidewalk, or the notice may be served by registered or certified mail, return receipt requested. If after diligent search the owner is not discovered, the public works director shall cause a copy of the notice to be posted in a conspicuous place on the property, and such posting shall have the same effect as service of notice by mail or by personal service upon the owner of the property.

D. The person serving the notice shall file with the city recorder a statement stating the time, place and manner of service or notice.

Response: It is understood that all future home owners within the project are to be responsible for maintaining sidewalks along their frontage. This standard is understood.

12.04.033 City may do work.

If repair of the sidewalk is not completed within ninety days after the service of notice, the public works director shall carry out the needed work on the sidewalk. Upon completion of the work, the public works director shall submit an itemized statement of the cost of the work to the finance director. The city may, at its discretion, construct, repair or maintain sidewalks deemed to be in disrepair by the public works director for the health, safety and general welfare of the residents of the city.

Response: As mentioned above, it is understood that all future home owners within the project are to be responsible for maintaining sidewalks and abutting curbs along their frontage. It is also understood that if repairs are not completed within 90 days of a "Service of Notice," the Public Works Director shall carry out the needed work and bill the property owner.

12.04.034 Assessment of costs.

Upon receipt of the report, the finance director shall assess the cost of the sidewalk work against the property adjacent to the sidewalk. The assessment shall be a lien against the property and may be collected in the same manner as is provided for in the collection of street improvement assessment.

Response: It is understood that a lien against any property may be collected for any necessary repairs to sidewalks by the City.

12.04.040 Streets – Enforcement.

Any person whose duty it is to maintain and repair any sidewalk, as provided by this chapter, and who fails to do so shall be subject to

the enforcement procedures of Chapters 1.16, 1.20 and 1.24. Failure to comply with the provisions of this chapter shall be deemed a nuisance. Violation of any provision of this chapter is subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24.

Response: It is understood that failure of future home owners to comply with a request to maintain sidewalks will be subject to code enforcement procedures.

12.04.050 Retaining walls— Required.

Every owner of a lot within the city, abutting upon an improved street, where the surface of the lot or tract of land is above the surface of the improved street and where the soil or earth from the lot, or tract of land is liable to, or does slide or fall into the street or upon the sidewalk, or both, shall build a retaining wall, the outer side of which shall be on the line separating the lot, or tract of land from the improved street, and the wall shall be so constructed as to prevent the soil or earth from the lot or tract of land from falling or sliding into the street or upon the sidewalk, or both, and the owner of any such property shall keep the wall in good repair.

Response: All future retaining walls associated with the project are planned to be constructed outside of any future right-of-way, and will not be located such that soil or earth will slide onto the street or sidewalk. This standard is satisfied.

12.04.060 Retaining walls— Maintenance.

When a retaining wall is necessary to keep the earth from falling or sliding onto the sidewalk or into a public street and the property owner or person in charge of that property fails or refuses to build such a wall, such shall be deemed a nuisance. The violation of any provision of this chapter is subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24.

Response: All future retaining walls associated with the project are planned to be maintained by property owners. If, for any reason, retaining walls should fail, they are to be repaired to their original state. This standard is met.

12.04.070 Removal of sliding dirt.

It shall be the duty of the owner of any property as mentioned in Section 12.04.050, and in case the owner is a nonresident, then the agent or other person in charge of the same, to remove from the street or sidewalk or both as the case may be, any and all earth or dirt falling on or sliding into or upon the same from the property, and to build and maintain in order at all times, the retaining wall as herein required; and upon the failure, neglect or refusal of the land owner, the agent or person in charge of the same to clean away such earth or dirt, falling or sliding from the property into the street or upon the sidewalk, or both, or to build the retaining wall, shall be deemed guilty of a misdemeanor.

Response: The project is not planned to cause the sliding of dirt onto the future internal streets or sidewalks of the subdivision. Property owners within the project are to be responsible for compliance with City codes and subject to enforcement action by the City for such codes, including the removal of dirt falling on or sliding into streets or sidewalks. This standard is understood.

12.04.080 Excavations – Permit required.

It shall be unlawful for any person to dig up, break, excavate, disturb, dig under or undermine any public street or alley, or any part thereof or any macadam, gravel, or other street pavement or improvement without first applying for and obtaining from the engineer a written permit so to do.

Response: All appropriate permits are planned to be obtained prior to any excavation activities within the boundaries of the subdivision. This standard will be satisfied.

12.04.090 Excavations – Permit restrictions.

The permit shall designate the portion of the street to be so taken up or disturbed, together with the purpose for making the excavation, the number of days in which the work shall be done, and the trench or excavation to be refilled and such other restrictions as may be deemed of public necessity or benefit.

Response: All work specified within issued permits to be performed within the public right-of-way are planned to be conducted within the approved timelines indicated in the permit. If a violation of this standard occurs, the appropriate party may be cited in accordance with the penalties carried by said permit. This standard is met.

12.04.100 Excavations – Restoration of Pavement.

Whenever any excavation shall have been made in any pavement or other street improvement on any street or alley in the city for any purpose whatsoever under the permit granted by the engineer, it shall be the duty of the person making the excavation to restore the pavement in accordance with the City of Oregon City Public Works Pavement Cut Standard in effect at the time a right-of-way permit application is filed. The city commission may adopt and modify the City of Oregon City Public Works Pavement Cut Standards by resolution as necessary to implement the requirements of this chapter.

Response: It is understood that any street or alley on which excavation activities are performed are to be repaired to their original condition. This standard is met.

12.04.110 Excavations – Nuisance – Penalty.

Any excavation in violation of this chapter shall be deemed a nuisance. Violation of any provision of this chapter is subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24.

Response: Excavations that violate this Chapter are not planned. It is understood that any party in violation of any provision of this Chapter are to be subject to the enforcement procedures of Chapters 1.16, 1.20, and 1.24 of the Oregon City Municipal Code. This standard is met.

12.04.120 Obstructions – Permit required.

A. Permanent Obstructions. It is unlawful for any person to place, put or maintain any obstruction, other than a temporary obstruction, as defined in subsection B. of this section, in any public street or alley in the city, without obtaining approval for a right-of-way permit from the commission by passage of a resolution.

B. Temporary Obstructions.

C. Fees. The fee for obtaining a right-of-way permit for either a permanent obstruction or a temporary obstruction shall be set by resolution of the commission.

Response: No permanent obstructions are planned with this application. If a temporary obstruction is required as part of the construction of the subdivision, a right-of-way permit application and appropriate fee are to be submitted to the City for review and approval. These standards can be satisfied, if applicable.

12.04.130 Obstructions – Sidewalk sales.

A. It is unlawful for any person to use the public sidewalks of the city for the purpose of packing, unpacking or storage of goods or merchandise or for the display of goods or merchandise for sale. It is permissible to use the public sidewalks for the process of expeditiously loading and unloading goods and merchandise.

B. The city commission may, in its discretion, designate certain areas of the city to permit the display and sale of goods or merchandise on the public sidewalks under such conditions as may be provided.

Response: Sidewalk sales are not associated with this subdivision application. Therefore, this standard does not apply.

12.04.140 Obstructions – Nuisance – Penalty.

Any act or omission in violation of this chapter shall be deemed a nuisance. Violation of any provision of this chapter is subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24.

Response: Violating acts or omissions are not associated with this subdivision application. This standard does not apply.

12.04.150 Street and alley vacations – Cost.

At the time of filing a petition for vacation of a street, alley or any part thereof, a fee as established by city commission resolution shall be paid to the city.

Response: No street or alley vacations are associated with this subdivision application. Therefore, this standard does not apply.

12.04.160 Street vacations – Restrictions.

The commission, upon hearing such petition, may grant the same in whole or in part, or may deny the same in whole or in part, or may grant the same with such reservations as would appear to be for the public interest, including reservations pertaining to the maintenance and use of underground public utilities in the portion vacated.

Response: No street or alley vacations are associated with the application. Therefore, this standard does not apply.

12.04.170 Street design – Purpose and general provisions.

All development shall be in conformance with the policies and design standards established by this chapter and with applicable standards in the city's public facility master plan and city design standards and specifications. In reviewing applications for development, the city

engineer shall take into consideration any approved development and the remaining development potential of adjacent properties. All street, water, sanitary sewer, storm drainage and utility plans associated with any development must be reviewed and approved by the city engineer prior to construction. All streets, driveways or storm drainage connections to another jurisdiction's facility or right-of-way must be reviewed by the appropriate jurisdiction as a condition of the preliminary plat and when required by law or intergovernmental agreement shall be approved by the appropriate jurisdiction.

Response: Street and utility stubs to adjoining properties to the southwest of the project are planned to accommodate future development. In addition, a 20-foot access and utility easement is planned to extend to the abutting property southeast of the project. However, this property is located outside of the UGB. There are no other opportunities to extend services to adjoining properties. This standard is met.

12.04.175 Street design—Generally.

The location, width and grade of street shall be considered in relation to: existing and planned streets, topographical conditions, public convenience and safety for all modes of travel, existing and identified future transit routes and pedestrian/bicycle accessways, overlay districts, and the proposed use of land to be served by the streets. The street system shall assure an adequate traffic circulation system with intersection angles, grades, tangents and curves appropriate for the traffic to be carried considering the terrain. To the extent possible, proposed streets shall connect to all existing or approved stub streets that abut the development site. The arrangement of streets shall either:

A. Provide for the continuation or appropriate projection of existing principal streets in the surrounding area and on adjacent parcels or conform to a plan for the area approved or adopted by the city to meet a particular situation where topographical or other conditions make continuance or conformance to existing streets impractical;

B. Where necessary to give access to or permit a satisfactory future development of adjoining land, streets shall be extended to the boundary of the development and the resulting dead-end street (stub) may be approved with a temporary turnaround as approved by the city engineer. Notification that the street is planned for future extension shall be posted on the stub street until the street is extended and shall inform the public that the dead-end street may be extended in the future. Access control in accordance with [Chapter] 12.04 shall be required to preserve the objectives of street extensions.

Response: Public streets are planned in the subdivision to provide access to lots/future homes and provide for neighborhood connectivity/circulation. The preliminary plans show the locations and arrangement of these improvements. The project will extend Orchard Grove Drive, Larence Lane, Skellenger Way, and Tolstrup Drive. This project includes dedicating property along the project's southwest property line for the future extension of White Lane, which will allow future development of adjoining underdeveloped property. This standard is met.

12.04.180 Street design.

All development regulated by this chapter shall provide street improvements in compliance with the standards in Figure 12.04.180 depending on the street classification set forth in the Transportation System Plan and the Comprehensive Plan designation of the adjacent property, unless an alternative plan has been adopted. The standards provided below are maximum design standards and may be reduced with an alternative street design which may be approved based on the modification criteria in [Section] 12.04.007. The steps for reducing the maximum design below are found in the Transportation System Plan.

Table 12.04.180 Street Design										
Road Classification	Comprehensive Plan Designation	Right-of-Way Width	Pavement Width	Public Access	Sidewalk	Landscape Strip	Bike Lane	Street Parking	Travel Lanes	Median
Local	Residential	54 ft.	32 ft.	0.5 ft.	5 ft.	5.5 ft.	(2) 16 ft Shared Space			N/A

1. Pavement width includes, bike lane, street parking, travel lanes and median.
2. Public access, sidewalks, landscape strips, bike lanes and on-street parking are required on both sides of the street in all designations. The right-of-way width and pavement widths identified above include the total street section.
3. A 0.5 foot curb is included in landscape strip or sidewalk width.
4. Travel lanes may be through lanes or turn lanes.
5. The 0.5 foot public access provides access to adjacent public improvements.
6. Alleys shall have a minimum right-of-way width of twenty feet and a minimum pavement width of sixteen feet. If alleys are provided, garage access shall be provided from the alley.

Response: As shown on the preliminary plans, the planned extension of adjoining residential streets and new internal streets have been designed to meet the minimum requirements outlined in the above table. The planned design is consistent with the guidance provided by City staff at the pre-application conference and in the City Pre-Application Conference Summary (PA 16-54) dated 12/28/16. This standard is met.

12.04.185 Street design—Access control.

A. A street which is dedicated to end at the boundary of the development or in the case of half-streets dedicated along a boundary shall have an access control granted to the city as a city controlled plat restriction for the purposes of controlling ingress and egress to the property adjacent to the end of the dedicated street. The access control restriction shall exist until such time as a public street is created, by dedication and accepted, extending the street to the adjacent property.

B. The city may grant a permit for the adjoining owner to access through the access control.

C. The plat shall contain the following access control language or similar on the face of the map at the end of each street for which access control is required: "Access Control (See plat restrictions)."

D. Said plats shall also contain the following plat restriction note(s): "Access to (name of street or tract) from adjoining tracts (name of deed document number[s]) shall be controlled by the City of Oregon City by the recording of this plat, as shown. These access controls shall be automatically terminated upon the acceptance of a public road dedication or the recording of a plat extending the street to adjacent property that would access through those Access Controls."

Response: The area planned to be dedicated for the future extension of White Lane at the project's southwest property line includes appropriate plat restrictions allowing access to underdeveloped property to the southwest, which are planned to be placed on the final plat prior to recording. This standard is met.

12.04.190 Street design—Alignment.

The centerline of streets shall be:

A. Aligned with existing streets by continuation of the centerlines; or

B. Offset from the centerline by no more than five (5) feet, provided appropriate mitigation, in the judgment of the city engineer, is provided to ensure that the offset intersection will not pose a safety hazard.

Response: The extension of adjoining streets through the project will either align or be offset no more than 5 feet with centerlines of other streets in or abutting the project. This standard is met.

12.04.194 Traffic sight obstructions.

All new streets shall comply with the Traffic Sight Obstructions in Chapter 10.32.

Response: Traffic sight obstructions detailed in Chapter 10.32 have been addressed previously in this narrative. This standard is met.

12.04.195 Spacing standards.

A. All new streets shall be designed as local streets unless otherwise designated as arterials and collectors in Figure 8 in the transportation system plan. The maximum block spacing between streets is five hundred thirty feet and the minimum block spacing between streets is one hundred fifty feet as measured between the right-of-way centerlines. If the maximum block size is exceeded, pedestrian accessways must be provided every three hundred thirty feet. The spacing standards within this section do not apply to alleys.

Response: Planned streets within the subdivision have been designed as local streets. With the exception of the "island" block created by the extension of the adjoining Skellenger Way and Tolstrup Drive, no blocks in the project exceed the maximum block length spacing standard of 530 feet requiring a midblock pedestrian accessway. This application includes

a modification to the midblock pedestrian connection required for the "island" block as addressed previously under Subsection 12.04.007 Modifications.

B. **All new development and redevelopment shall meet the minimum driveway spacing standards identified in Table 12.04.195.B.**

Table 12.04.195.B Minimum Driveway Spacing Standards		
Street Functional Classification	**Minimum Driveway Spacing Standards**	**Distance**
Local Streets	Minimum distance from a street corner to a driveway for all uses and Minimum distance between driveways for uses other than single and two-family dwellings	25 ft.

The distance from a street corner to a driveway is measured along the right-of-way from the edge of the intersection right-of-way to the nearest portion of the driveway and the distance between driveways is measured at the nearest portions of the driveway at the right-of-way.

Response: Driveways for the future homes accessing the new local streets within the project are planned to be a minimum of 25 feet from the right-of-way line of all intersections. This standard is met.

12.04.199 **Pedestrian and bicycle accessways.**

Pedestrian/bicycle accessways are intended to provide direct, safe and convenient connections between residential areas, retail and office areas, institutional facilities, industrial parks, transit streets, neighborhood activity centers, rights-of-way, and pedestrian/bicycle accessways which minimize out-of-direction travel, and transit-orientated developments where public street connections for automobiles, bicycles and pedestrians are unavailable. Pedestrian/bicycle accessways are appropriate in areas where public street options are unavailable, impractical or inappropriate. Pedestrian and bicycle accessways are required through private property or as right-of-way connecting development to the right-of-way at intervals not exceeding three hundred thirty feet of frontage; or where the lack of street continuity creates inconvenient or out of direction travel patterns for local pedestrian or bicycle trips.

Response: As demonstrated on the preliminary plans, the planned street system includes public sidewalks on both sides of the project's interior streets. The sidewalks provide convenient pedestrian and bicycle access and connectivity for residents in the area. The planned street system also meets the intent of the "Proposed Metro Regional Trail," as indicated on the Oregon City Conceptual Trails Map and shown on the preliminary plans.

This application includes modifying the midblock pedestrian connection required for the "island" block, that exceeds the maximum block spacing standard of Section 12.04.195, addressed previously in this narrative. No additional pedestrian and/or bicycle accessways are required or planned as part of this application.

12.04.205 **Mobility standards.**

Development shall demonstrate compliance with intersection mobility standards. When evaluating the performance of the

transportation system, the City of Oregon City requires all intersections, except for the facilities identified in subsection D below, to be maintained at or below the following mobility standards during the two-hour peak operating conditions. The first hour has the highest weekday traffic volumes and the second hour is the next highest hour before or after the first hour. Except as provided otherwise below, this may require the installation of mobility improvements as set forth in the transportation system plan or as otherwise identified by the city transportation engineer.

Response: Findings within the project's Transportation Impact Study (TIS) prepared by Lancaster Engineering, demonstrate that all Level of Service (LOS) requirements are satisfied. Please refer to the TIS for further information regarding LOS. This standard is met.

12.04.210 Street design—Intersection angles.

Except where topography requires a lesser angle, streets shall be laid out to intersect at angles as near as possible to right angles. In no case shall the acute angles be less than eighty degrees unless there is a special intersection design. An arterial or collector street intersecting with another street shall have at least one hundred feet of tangent adjacent to the intersection unless topography requires a lesser distance. Other streets, except alleys, shall have at least fifty feet of tangent adjacent to the intersection unless topography requires a lesser distance. All street intersections shall be provided with a minimum curb return radius of twenty-five feet for local streets. Larger radii shall be required for higher street classifications as determined by the city engineer. Additional right-of-way shall be required to accommodate curb returns and sidewalks at intersections. Ordinarily, intersections should not have more than two streets at any one point.

Response: As shown on the preliminary plans, all intersection angles are laid out at right angles, including at least 50 feet of tangent adjacent to the intersection, and have curb return radii of 25 feet. Necessary rights-of-way are planned to accommodate these street improvements. The application complies with the above listed requirements.

12.04.215 Street design—Off-site street improvements.

During consideration of the preliminary plan for a development, the decision maker shall determine whether existing streets impacted by, adjacent to, or abutting the development meet the city's applicable planned minimum design or dimensional requirements. Where such streets fail to meet these requirements, the decision-maker shall require the applicant to make proportional improvements sufficient to achieve conformance with minimum applicable design standards required to serve the proposed development.

Response: Appropriate street improvements are planned along the project's frontage on Orchard Grove Drive and at connection points of other abutting streets planned to be extended through the project. This requirement is met.

12.04.220 Street design—Half street.

Half streets, while generally not acceptable, may be approved where essential to the development, when in conformance with all other applicable requirements, and where it will not create a safety hazard.

When approving half streets, the decision maker must first determine that it will be practical to require the dedication of the other half of the street when the adjoining property is divided or developed. Where the decision maker approves a half street, the applicant must construct an additional ten feet of pavement width so as to make the half street safe and usable until such time as the other half is constructed. Whenever a half street is adjacent to property capable of being divided or developed, the other half of the street shall be provided and improved when that adjacent property divides or develops. Access control may be required to preserve the objectives of half streets.

When the remainder of an existing half-street improvement is made it shall include the following items: dedication of required right-of-way, construction of the remaining portion of the street including pavement, curb and gutter, landscape strip, sidewalk, street trees, lighting and other improvements as required for that particular street. It shall also include at a minimum the pavement replacement to the centerline of the street. Any damage to the existing street shall be repaired in accordance with the city's "Moratorium Pavement Cut Standard" or as approved by the city engineer.

Response: As shown on the preliminary plans, street improvements are planned along the project's frontage on Orchard Grove Drive, where it abuts the project. Planned improvements along Orchard Grove Drive include ±12 to ±37 feet of right-of-way dedication, additional pavement, curb and gutter, 5-foot wide planter strip, and 5-foot wide sidewalk. The future extension of internal street improvements includes a 54-foot right-of-way, 32 feet of asphalt pavement, curb and gutter, 5-foot wide planter strip, and 5-foot wide sidewalk. This standard is met.

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

The city discourages the use of cul-de-sacs and permanent dead-end streets except where construction of a through street is found by the decision maker to be impracticable due to topography or some significant physical constraint such as geologic hazards, wetland, natural or historic resource areas, dedicated open space, existing development patterns, arterial access restrictions or similar situation as determined by the community development director. When permitted, access from new cul-de-sacs and permanent dead-end streets shall be limited to a maximum of twenty-five dwelling units and a maximum street length of two hundred feet, as measured from the right-of-way line of the nearest intersecting street to the back of the cul-de-sac curb face. In addition, cul-de-sacs and dead end roads shall include pedestrian/bicycle accessways as required in this chapter. This section is not intended to preclude the use of curvilinear eyebrow widening of a street where needed.

Where approved, cul-de-sacs shall have sufficient radius to provide adequate turn-around for emergency vehicles in accordance with fire district and city adopted street standards. Permanent dead-end streets other than cul-de-sacs shall provide public street right-of-way/easements sufficient to provide turn-around space with appropriate no-parking signs or markings for waste disposal, sweepers, and other long vehicles in the form of a hammerhead or other design to be approved by the decision maker. Driveways shall

be encouraged off the turnaround to provide for additional on-street parking space.

Response: As shown on the preliminary plans, a cul-de-sac is planned in the southeast portion of the project due to the irregular shape of the subject site, abutting property to the south being outside the UGB, and a large PGE easement running through the property. The planned cul-de-sac has been designed with sufficient radius to provide adequate turn-around for emergency vehicles, and does not provide access to no more than 25 dwelling units. No-parking signs are planned to be installed within the cul-de-sac to accommodate future waste disposal and street sweeper vehicles. The planned cul-de-sac does however exceed the maximum street length of 200 feet, which has been addressed previously under Subsection 12.04.007 Modifications. This standard is met.

12.04.230 Street design—Street names.

Except for extensions of existing streets, no street name shall be used which will duplicate or be confused with the name of an existing street. Street names shall conform to the established standards in the city and shall be subject to the approval of the city.

Response: The majority of the project's internal street system include extensions of existing streets with established street names from adjoining residential projects. All other streets within the project are planned to be named in accordance to this subsection and submitted to the City and Clackamas County for approval. This standard is met.

12.04.235 Street design—Grades and curves.

Grades and center line radii shall conform to the standards in the city's street design standards and specifications.

Response: As shown on the preliminary plans, all grade lines and center line radii comply with the City's street design standards and specifications. This standard is met.

12.04.245 Street design—Pedestrian and bicycle safety.

Where deemed necessary to ensure public safety, reduce traffic hazards and promote the welfare of pedestrians, bicyclists and residents of the subject area, the decision maker may require that local streets be so designed as to discourage their use by nonlocal automobile traffic.

All crosswalks shall include a large vegetative or sidewalk area which extends into the street pavement as far as practicable to provide safer pedestrian crossing opportunities. These curb extensions can increase the visibility of pedestrians and provide a shorter crosswalk distance as well as encourage motorists to drive slower. The decision maker may approve an alternative design that achieves the same standard for constrained sites or where deemed unnecessary by the city engineer.

Response: The project's internal street system has been designed to City standards. The overall street pattern discourages non-local through traffic. This standard is met.

12.04.255 Street design—Alleys.

Public alleys shall be provided in the following districts R-5, R-3.5, R-2, MUC-1, MUC-2 and NC zones unless other permanent

provisions for private access to off-street parking and loading facilities are approved by the decision maker. The corners of alley intersections shall have a radius of not less than ten feet.

Response: This project is not within any of the zoning districts listed in this standard. Therefore, Public alleys are not required or included in this application. This standard is not relevant to the application.

12.04.260 Street design—Transit.

Streets shall be designed and laid out in a manner that promotes pedestrian and bicycle circulation. The applicant shall coordinate with transit agencies where the application impacts transit streets as identified in [Section] 17.04.1310. Pedestrian/bicycle access ways shall be provided as necessary in Chapter 12.04 to minimize the travel distance to transit streets and stops and neighborhood activity centers. The decision maker may require provisions, including easements, for transit facilities along transit streets where a need for bus stops, bus pullouts or other transit facilities within or adjacent to the development has been identified.

Response: Public streets and sidewalks are planned to provide access to the project's future homes and for neighborhood connectivity/circulation. The preliminary plans show the location and arrangement of planned improvements, which promote pedestrian and bicycle circulation. Planned streets and sidewalks, together with off-site connections, minimize the travel distance to transit streets (South Central Point Road) and other off-site destinations. The need for additional transit facilities and bus stops have not been identified and are not warranted. This standard is met.

12.04.265 Street design—Planter strips.

All development shall include vegetative planter strips that are five feet in width or larger and located adjacent to the curb. This requirement may be waived or modified if the decision maker finds it is not practicable. The decision maker may permit constrained sites to place street trees on the abutting private property within ten feet of the public right-of-way if a covenant is recorded on the title of the property identifying the tree as a city street tree which is maintained by the property owner. Development proposed along a collector, minor arterial, or major arterial street may use tree wells with root barriers located near the curb within a wider sidewalk in lieu of a planter strip, in which case each tree shall have a protected area to ensure proper root growth and reduce potential damage to sidewalks, curbs and gutters.

To promote and maintain the community tree canopy adjacent to public streets, trees shall be selected and planted in planter strips in accordance with Chapter 12.08, Street Trees. Individual abutting lot owners shall be legally responsible for maintaining healthy and attractive trees and vegetation in the planter strip. If a homeowners' association is created as part of the development, the association may assume the maintenance obligation through a legally binding mechanism, e.g., deed restrictions, maintenance agreement, etc., which shall be reviewed and approved by the city attorney. Failure to properly maintain trees and vegetation in a planter strip shall be a violation of this code and enforceable as a civil infraction.

Response: As shown on the preliminary plans, planter strips constructed to City standards are shown along all public streets within and/or adjacent to the project. These areas are planned to be improved and planted with street trees when new homes are built. This standard is met.

12.04.270 Standard construction specifications.

The workmanship and materials for any work performed under permits issued per this chapter shall be in accordance with the edition of the "Oregon Standard Specifications for Construction" as prepared by the Oregon Department of Transportation (ODOT) and the Oregon Chapter of American Public Works Association (APWA) and as modified and adopted by the city in accordance with this ordinance, in effect at the time of application. The exception to this requirement is where this chapter and the Public Works Street Design Drawings provide other design details, in which case the requirements of this chapter and the Public Works Street Design Drawings shall be complied with. In the case of work within ODOT or Clackamas County rights-of-way, work shall be in conformance with their respective construction standards.

Response: All public improvements have been designed by a professional engineer licensed in the State of Oregon. The plans for these improvements are planned to be submitted to the City and reviewed for consistency with all City requirements. After the appropriate City construction permits are obtained, the improvements are planned to be constructed by a licensed General Contractor, in accordance with the approved plans. Finally, the improvements are to be inspected for consistency with the approved final plans prior to City acceptance. This standard is met.

12.04.280 Violation—Penalty.

Any act or omission in violation of this chapter shall be deemed a nuisance. Violation of any provision of this chapter is subject to the code enforcement procedures of Chapters 1.16, 1.20 and 1.24.

Response: It is understood that any act in violation of this Chapter is to be deemed a nuisance and be subject to code enforcement procedures.

Chapter 12.08 - PUBLIC AND STREET TREES

12.08.015 Street tree planting and maintenance requirements.

All new construction or major redevelopment shall provide street trees adjacent to all street frontages. Species of trees shall be selected based upon vision clearance requirements, but shall in all cases be selected from the Oregon City Street Tree List or be approved by a certified arborist. If a setback sidewalk has already been constructed or the Development Services determines that the forthcoming street design shall include a setback sidewalk, then all street trees shall be installed with a planting strip. If existing street design includes a curb-tight sidewalk, then all street trees shall be placed within the front yard setback, exclusive of any utility easement.

A. One street tree shall be planted for every thirty-five feet of property frontage. The tree spacing shall be evenly distributed throughout the total development frontage. The community development director may approve an alternative street tree plan if site or other constraints

prevent meeting the placement of one street tree per thirty-five feet of property frontage.

B. The following clearance distances shall be maintained when planting trees:

1. Fifteen feet from streetlights;

2. Five feet from fire hydrants;

3. Twenty feet from intersections;

4. A minimum of five feet (at mature height) below power lines.

C. All trees shall be a minimum of two inches in caliper at six inches above the root crown and installed to city specifications.

D. All established trees shall be pruned tight to the trunk to a height that provides adequate clearance for street cleaning equipment and ensures ADA complaint clearance for pedestrians.

Response: As shown on the preliminary plans, the total street frontage for the project is approximately ±7,315 linear feet. If one street tree is required for every 35 feet of property frontage, then ±209 street trees from the Oregon City Street Tree List (or approved by a certified arborist) are to be planted in conformance with this Section. Precise street tree placement is planned to be addressed at the time building permits are reviewed. These standards are met.

12.08.020 Street tree species selection.

The community development director may specify the species of street trees required to be planted if there is an established planting scheme adjacent to a lot frontage, if there are obstructions in the planting strip, or if overhead power lines are present.

Response: Street trees from the Oregon City Street Tree List (or approved by a certified arborist) are planned to be planted in conformance with this Section, as shown on the preliminary plans. Precise street tree placement is to be addressed at the time building permits are reviewed. This standard is met.

12.08.025 General tree maintenance.

Abutting property owners shall be responsible for the maintenance of street trees and planting strips. Topping of trees is permitted only under recommendation of a certified arborist, or other qualified professional, if required by city staff. Trees shall be trimmed appropriately. Maintenance shall include trimming to remove dead branches, dangerous limbs and to maintain a minimum seven-foot clearance above all sidewalks and ten-foot clearance above the street. Planter strips shall be kept clear of weeds, obstructing vegetation and trash.

Response: General tree and planter strip maintenance is planned to be the responsibility of future home owners, as indicated in this standard. This standard does not apply at this time.

12.08.030 Public property tree maintenance

The city shall have the right to plant, prune, maintain and remove trees, plants and shrubs in all public rights-of-way and public grounds, as may be necessary to ensure public safety or to preserve

and enhance the symmetry or other desirable characteristics of such public areas. The natural resources committee may recommend to the community development director the removal of any tree or part thereof which is in an unsafe condition, or which by reason of its nature is injurious to above or below-ground public utilities or other public improvements.

Response: It is understood that the City has the right to maintain trees in the public right-of-way as mentioned in this standard. This standard is met.

12.08.035 Public tree removal.

Existing street trees shall be retained and protected during construction unless removal is specified as part of a land use approval or in conjunction with a public facilities construction project, as approved by the community development director. A diseased or hazardous street tree, as determined by a registered arborist and verified by the City, may be removed if replaced. A non-diseased, non-hazardous street tree that is removed shall be replaced in accordance with the Table 12.08.035.

All new street trees will have a minimum two-inch caliper trunk measured six inches above the root crown. The community development director may approve off-site installation of replacement trees where necessary due to planting constraints. The community development director may additionally allow a fee in-lieu of planting the tree(s) to be placed into a city fund dedicated to planting trees in Oregon City in accordance with Oregon City Municipal Code 12.08.

Replacement Schedule for Trees Determined to be Dead, Diseased or Hazardous by a Certified Arborist		Replacement Schedule for Trees Not Determined to be Dead, Diseased or Hazardous by a Certified Arborist	
Diameter of tree to be Removed (inches of diameter at 4-ft. height)	Number of Replacement Trees to be Planted	Diameter of tree to be Removed (inches of diameter at 4-ft. height)	Number of Replacement Trees to be Planted
Any diameter	1 tree	Less than 6”	1 Tree
		6” to 12”	2 Trees
		13” to 18”	3 Trees
		19” to 24”	4 Trees
		25” to 30”	5 Trees
		31” and over	8 Trees

Response: There are no existing street trees associated with the parent properties. Existing street trees on abutting properties are planned to be retained and protected during future construction. This standard is met.

Title 13 - PUBLIC SERVICES

Chapter 13.12 - STORMWATER MANAGEMENT

13.12.050 Applicability and exemptions.

This chapter establishes performance standards for stormwater conveyance, quantity and quality. Additional performance standards

for erosion prevention and sediment control are established in OCMC 17.47.

A. Stormwater Conveyance. The stormwater conveyance requirements of this chapter shall apply to all stormwater systems constructed with any development activity, except as follows:

1. The conveyance facilities are located entirely on one privately owned parcel;

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.

Response: The project is subject to applicable City stormwater conveyance requirements. Refer to the Preliminary Stormwater Report included in the application materials for additional information regarding the project's planned stormwater conveyance system.

B. Water Quality and Flow Control. The water quality and flow control requirements of this chapter shall apply to the following proposed uses or developments, unless exempted under subsection C:

1. Activities located wholly or partially within water quality resource areas pursuant to Chapter 17.49 that will result in the creation of more than five hundred square feet of impervious surface within the WQRA or will disturb more than one thousand square feet of existing impervious surface within the WQRA as part of a commercial or industrial redevelopment project. These square footage measurements will be considered cumulative for any given five-year period; or

2. Activities that create or replace more than five thousand square feet of impervious surface per parcel or lot, cumulated over any given five-year period.

Response: This project is subject to applicable City stormwater quantity control requirements. Refer to the Preliminary Stormwater Report included in the application materials for additional information regarding the project's planned stormwater system. This standard is met.

13.12.080 Submittal requirements.

A. Applications subject to stormwater conveyance, water quality, and/or flow control requirements of this chapter shall prepare engineered drainage plans, drainage reports, and design flow calculation reports in compliance with the submittal requirements of the Public Works Stormwater and Grading Design Standards.

B. Each project site, which may be composed of one or more contiguous parcels of land, shall have a separate valid city approved plan and report before proceeding with construction.

Response: A Preliminary Stormwater Report is included in the application materials, in accordance with the Oregon City Municipal Code (OCMC). The Preliminary Stormwater Report includes additional details. These standards are met.

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 facilities will accomplish the purpose statements of this chapter.**

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, and similar goals. These purpose criteria are reflected in the approval criteria found in this Section. As shown on the preliminary plans, the project's stormwater is planned to be collected and conveyed to Tract B, which is planned to be a public stormwater facility. Stormwater detained and treated in the stormwater facility is planned to be discharged to an existing drainage channel to the south of the project site. For additional information, please refer to the preliminary plans and Preliminary Stormwater Report included in the application materials.

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.**

Response: The Preliminary Stormwater Report and preliminary plans included in the application materials meet the requirements of the Public Works Stormwater and Grading Design Standards adopted under Section 13.12.020. This criterion is met.

C. **The storm drainage design within the proposed development includes provisions to adequately control runoff from all public and private streets and roof, footing, and area drains and ensures future extension of the current drainage system.**

Response: The Preliminary Stormwater Report included in the application materials demonstrates that the planned stormwater system has adequate capacity to receive runoff from all public and private streets, roof, footing, and area drains within the project. Please refer to the Preliminary Stormwater Report for additional information. This criterion is met.

D. **Streambank erosion protection is provided where stormwater, directly or indirectly, discharges to open channels or streams.**

Response: The Preliminary Stormwater Report included in the application materials demonstrates that the potential for streambank erosion is not increased as a result of this project through stormwater detention and protection of outfall locations. This criterion is met.

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

Response: Specific operation and maintenance measures are planned to be provided to ensure that the stormwater facility is properly operated and maintained. For further information, please refer to the Preliminary Stormwater Report included in the application materials. This criterion is satisfied.

Title 16 - LAND DIVISIONS

Chapter 16.08 - SUBDIVISIONS—PROCESS AND STANDARDS

16.08.015 Preapplication conference required.

Before the city will accept a subdivision application, the applicant must schedule and attend a preapplication conference in accordance with Section 17.50.050. At a minimum, an applicant should bring to the preapplication conference a tax map of the subject tax lot(s) and surrounding tax lots, scale drawings of the proposed subdivision lotting pattern, streets, utilities and important site features and improvements, and a topographic map of the property.

Response: A pre-application conference was held for this project on December 6, 2016. A copy of the Pre-Application Conference Summary is included in the application materials. This standard is met.

16.08.020 Preliminary subdivision plat application.

Within six months of the preapplication conference, an applicant may apply for preliminary subdivision plat approval. The applicant's submittal must provide a complete description of existing conditions, the proposed subdivision and an explanation of how the application meets all applicable approval standards. The following sections describe the specific submittal requirements for a preliminary subdivision plat, which include plan drawings, a narrative statement and certain tabular information. Once the application is deemed to be complete, the community development director shall provide notice of the application and an invitation to comment for a minimum of fourteen days to surrounding property owners in accordance with Section 17.50.090(A). At the conclusion of the comment period, the community development director will evaluate the application, taking into consideration all relevant, timely filed comments, and render a written decision in accordance with Chapter 17.50. The community development director's decision may be appealed to the city commission with notification to the planning commission.

Response: A pre-application conference was held for this project on December 6, 2016. This application contains all necessary submittal requirements. This requirement is met.

16.08.025 Preliminary subdivision plat—Required plans.

The preliminary subdivision plat shall specifically and clearly show the following features and information on the maps, drawings, application form or attachments. All maps and site drawings shall be at a minimum scale of one inch to fifty feet.

A. Site Plan. A detailed site development plan showing the location and dimensions of lots, streets, pedestrian ways, transit stops, common areas, building envelopes and setbacks, all existing and proposed utilities and improvements including sanitary sewer, stormwater and

water facilities, total impervious surface created (including streets, sidewalks, etc.) and an indication of existing and proposed land uses for the site. If required by staff at the pre-application conference, a subdivision connectivity analysis shall be prepared by a transportation engineer licensed by the state of Oregon that describes the existing and future vehicular, bicycle and pedestrian connections between the proposed subdivision and existing or planned land uses on adjacent properties. The subdivision connectivity analysis shall include shadow plats of adjacent properties demonstrating how lot and street patterns within the proposed subdivision will extend to and/or from such adjacent properties and can be developed meeting the existing Oregon City Municipal Code design standards and adopted Transportation System Plan, street design standards, and adopted concept plans, corridor and access management studies, engineering standards and infrastructure analyses.

Response: The preliminary plans include the above listed information, as applicable. This submittal requirement is met.

B. Traffic/Transportation Plan. The applicant's traffic/transportation information shall include two elements: (1) A detailed site circulation plan showing proposed vehicular, bicycle, transit and pedestrian access points and connections to the existing system, circulation patterns and connectivity to existing rights-of-way or adjacent tracts, parking and loading areas and any other transportation facilities in relation to the features illustrated on the site plan; and (2) a traffic impact study prepared by a qualified professional transportation engineer, licensed in the state of Oregon, that assesses the traffic impacts of the proposed development on the existing transportation system and analyzes the adequacy of the proposed internal transportation network to handle the anticipated traffic and the adequacy of the existing system to accommodate the traffic from the proposed development. In the preparation of the Traffic/Transportation Plan, the applicant shall reference the adopted Transportation System Plan. The city engineer may waive any of the foregoing requirements if determined that the requirement is unnecessary in the particular case.

Response: The preliminary plans included in the application materials include a Preliminary Conceptual Connectivity Analysis, Traffic/Transportation, Circulation, and Conceptual Redevelopment Plan, which shows the planned connections between the project and adjacent residential projects. A Transportation Impact Study, prepared in accordance with City requirements, is also included in the submittal materials. This requirement is met.

C. Natural Features Plan and Topography, Preliminary Grading and Drainage Plan. The applicant shall submit a map illustrating all of the natural features and hazards on the subject property and, where practicable, within two hundred fifty feet of the property's boundary. The map shall also illustrate the approximate grade of the site before and after development. Illustrated features must include all proposed streets and cul-de-sacs, the location and estimated volume of all cuts and fills, and all stormwater management features. This plan shall identify the location of drainage patterns and courses on the site and within two hundred fifty feet of the property boundaries where practicable. Features that must be illustrated shall include the following:

1. Proposed and existing street rights-of-way and all other transportation facilities;

2. All proposed lots and tracts;

3. All trees proposed to be removed prior to final plat with a diameter six inches or greater diameter at breast height (d.b.h);

4. All natural resource areas pursuant to Chapter 17.49, including all jurisdictional wetlands shown in a delineation according to the Corps of Engineers Wetlands Delineation Manual, January 1987 edition, and approved by the Division of State Lands and wetlands identified in the city of Oregon [City] Local Wetlands Inventory, adopted by reference in the city of Oregon City comprehensive plan;

5. All known geologic and flood hazards, landslides or faults, areas with a water table within one foot of the surface and all flood management areas pursuant to Chapter 17.42;

6. The location of any known state or federal threatened or endangered species;

7. All historic areas or cultural features acknowledged as such on any federal, state or city inventory;

8. All wildlife habitat or other natural features listed on any of the city's official inventories.

Response: The preliminary plans illustrate that no natural features exist on the project site or within 250 feet of the project's boundary. This has been confirmed by the project's Natural Resource Assessment, included in the application materials, and accepted by the City through the approval of a previous Type I NROD Verification application. The preliminary plans also illustrate planned grading associated with the project. This standard is met.

D. Archeological Monitoring Recommendation. For all projects that will involve ground disturbance, the applicant shall provide,

1. A letter or email from the Oregon State Historic Preservation Office Archaeological Division indicating the level of recommended archeological monitoring on-site, or demonstrate that the applicant had notified the Oregon State Historic Preservation Office and that the Oregon State Historic Preservation Office had not commented within forty-five days of notification by the applicant; and

2. A letter or email from the applicable tribal cultural resource representative of the Confederated Tribes of the Grand Ronde, Confederated Tribes of the Siletz, Confederated Tribes of the Umatilla, Confederated Tribes of the Warm Springs and the Confederated Tribes of the Yakama Nation indicating the level of recommended archeological monitoring on-site, or demonstrate that the applicant had notified the applicable tribal cultural resource representative and that the applicable tribal cultural resource representative had not commented within forty-five days of notification by the applicant.

If, after forty-five days notice from the applicant, the Oregon State Historic Preservation Office or the applicable tribal cultural resource representative fails to provide comment, the city will not require the letter or email as part of the completeness review. For the purpose of this section, ground disturbance is defined as the movement of native soils.

The community development director may waive any of the foregoing requirements if the community development director determines that the requirement is unnecessary in the particular case and that the intent of this chapter has been met.

Response: City staff provided notice to the Oregon State Historic Preservation Office (OSHPO) of the project following the December 6, 2016 pre-application conference. OSHPO has not commented to the best of the applicant's knowledge. This submittal requirement is met.

16.08.030 Preliminary subdivision plat—Narrative statement.

In addition to the plans required in the previous section, the applicant shall also prepare and submit a narrative statement that addresses the following issues:

A. Subdivision Description. A detailed description of the proposed development, including a description of proposed uses, number and type of residential units, allocation and ownership of all lots, tracts, streets, and public improvements, the structure of any homeowner's association, and each instance where the proposed subdivision will vary from some dimensional or other requirement of the underlying zoning district. For each such variance, a separate application will be required pursuant to Chapter 17.60, Variances;

Response: A detailed description of the project, including the above listed information, as applicable, is included in Sections I and II of this written statement. No variances are requested. This submittal requirement is met.

B. Timely Provision of Public Services and Facilities. The applicant shall explain in detail how and when each of the following public services or facilities is, or will be, adequate to serve the proposed development by the time construction begins:

1. Water,

Response: This application includes the extension of an existing 8-inch water main located in Orchard Grove Drive through the project and connect to existing water mains located in Larence Lane, Skellenger Way, and Tolstrup Drive to create a looped water system. Each lot is planned to be provided with an individual meter and service lateral from the extended 8-inch water main. This criterion is met.

2. Sanitary sewer,

Response: This application includes the extension of the existing 8-inch sanitary sewer main located in Orchard Grove Drive through the project. Each lot within the project is planned to be provided an individual service lateral from the extended 8-inch sanitary sewer main. This criterion is met.

3. Storm sewer and stormwater drainage,

Response: On-site stormwater is planned to be collected and conveyed to a stormwater facility located in Tract B adjacent to the planned Open Space Tract (Tract A). Stormwater is to be detained and treated in the stormwater facility and discharged into an existing drainage channel south of the project. For additional information, please refer to the Preliminary Stormwater Report and preliminary plans included in the application materials. This criterion is met.

4. Parks and recreation,

Response: An Open Space Tract is planned to be provided in the southeast portion of the project (Tract A). Any additional Park System Development Charges are to be assessed and paid at the time building permits are issued for future park development in the area. This ensures required funding for parks and satisfies this requirement.

5. Traffic and transportation,

Response: Site access is planned to be provided through the extension of abutting street stubs from adjoining residential projects. Future extensions of abutting street stubs include 54 feet of right-of-way, 32 feet of paved width, curb and gutters, 5-foot wide planter strips, and 5-foot wide sidewalks on both sides.

The application materials include a Transportation Impact Study for this project, prepared by Lancaster Engineering. Appropriate street improvements, connecting to existing transportation facilities, are shown in the preliminary plans. The TIS found that the existing streets, along with those planned, adequately accommodate the amount of additional traffic created by this project. Transportation Systems Development Charges are planned to be paid for each new home prior to issuance of a building permit. These fees fund future City and County public works street improvement projects. Please refer to the TIS for additional information. This standard is met.

6. Schools,

Response: The Oregon City School District will provide school services for the children of future residents. School funding is provided through a variety of sources, including construction excise taxes that are to be assessed with issuance of future building permits for the homes and future property taxes. This standard is met.

7. Fire and police services;

Response: Clackamas Fire District No. 1 will provide fire services. Property taxes are to be paid by future property owners to fund fire protection services, thereby ensuring funding for fire protection services.

The City of Oregon City Police Department provides police services. Property taxes are to be paid by future property owners to fund police protection services, thereby ensuring funding for police protection services. This standard is met.

Where adequate capacity for any of these public facilities and services is not demonstrated to be currently available, the applicant shall describe how adequate capacity in these services and facilities will be financed and constructed before recording of the plat;

Response: All public facilities and services are or are planned to be available to accommodate this project. Therefore, no additional description of financing and construction of adequate capacity is required.

> **C. Approval Criteria and Justification for Variances. The applicant shall explain how the proposed subdivision is consistent with the standards set forth in Chapter 16.12, 12.04 and any other applicable approval standards identified in the municipal code. For each instance where the applicant proposes a variance from some applicable dimensional or other numeric requirement, the applicant shall address the approval criteria from Chapter 17.60.**

Response: This application does not include any requests for variances. This standard does not apply.

> **D. Drafts of the proposed covenants, conditions and restrictions (CC&Rs), maintenance agreements, homeowner association agreements, dedications, deeds easements, or reservations of public open spaces not dedicated to the city, and related documents for the subdivision;**

Response: Draft CC&R's are included in the application materials. This standard is met.

> **E. A description of any proposed phasing, including for each phase the time, acreage, number of residential units, amount of area for nonresidential use, open space, development of utilities and public facilities;**

Response: Phasing is not planned. This standard does not apply to this application.

> **F. Overall density of the subdivision and the density by dwelling type for each.**

Response: Combined, the Wheeler Family properties total approximately ±22.56 acres of land. As stated previously, the site is subject to a separate application that, upon approval, will designate the site with R-8 zoning. The Wheeler Farms Subdivision is planned to include 77 lots for the future construction of single-family detached homes spread over the majority of the subject site (±21.26 acres). The remaining ±1.3 acres is planned to be retained by Don and Roxanne Wheeler where it is adjacent to their existing home (located off-site to the southeast). If the remainder property (to be retained by Don and Roxanne Wheeler) was to be subdivided at some point in the future, it could support ±7 dwelling units consistent with R-8 zoning.

On a gross acreage basis, the 77-lot subdivision (on ±21.26 acres) equates to ±3.7 dwelling units per acre. Based on the site's net developable area (±14.39 acres – after deduction of steeply sloped areas, open space, and public facilities/right-of-way), the density included in the subdivision is equal to ±5.35 dwelling units per acre. In this case, the applicant is voluntarily preserving a ±1.35-acre open space area within the subdivision. This area is not required to be dedicated as open space and if it was not set aside as open space (and thus included in the net developable area) then the density of the 77-lot subdivision would be lower still (±4.90 dwelling units per acre.)

Lot sizes in new subdivisions are permitted to be as small as 80% of the minimum size required in the underlying zone provided the average lot size (for the entire subdivision)

is as large or larger than the minimum required lot size in the underlying zone. In the R-8 zone, the minimum average lot size is 8,000 square feet. Based on the site's net developable area (±14.39 or ± 626,649 square feet), the maximum number of lots that can be included in the subdivision is 78. Based on the site's net developable area, the minimum number of lots that are required is 63.

As described above, the applicant is voluntarily preserving ±1.35 acres (±58,911 square feet) of open space within the subdivision. If this area was not planned to be preserved as open space, in would have been permitted to be developed as lots for additional homes. However, it will be preserved as open space, thus the number of lots and future homes in the subdivision is less than could have been created.

Based upon the above, the 77-lot subdivision does not exceed the maximum number of lots permitted and provides in excess of the minimum number of required lots. Thus, density requirements for the project are satisfied.

16.08.035 Notice and invitation to comment.

Upon the city's determination that an application for a preliminary subdivision plat is complete, pursuant to Chapter 17.50, the city shall provide notice of the application in accordance with requirements of Chapter 17.50 applicable to Type II decisions.

Response: Upon the City's review and completeness determination for this application, the City will provide notice in accordance with Section 17.50 of the OCMC. This standard is met.

16.08.040 Preliminary subdivision plat—Approval standards and decision.

The minimum approval standards that must be met by all preliminary subdivision plats are set forth in Chapter 16.12, and in the dimensional and use requirements set forth in the chapter of this code that corresponds to the underlying zone. The community development director shall evaluate the application to determine that the proposal does, or can through the imposition of conditions of approval, meet these approval standards. The community development director's decision shall be issued in accordance with the requirements of Section 17.50.

Response: This narrative includes responses demonstrating how this application complies with the applicable approval criteria. This narrative is supported by substantial evidence, including preliminary plans, a TIS, and other written documentation. This information, which is included in the application package, provides the basis for the City to approve the application. Therefore, this standard is met.

16.08.045 Building site—Frontage width requirement.

Each lot in a subdivision shall abut upon a cul-de-sac or street other than an alley for a width of at least twenty feet.

Response: As shown on the preliminary plans, each planned lot has more than 20 feet of frontage on a public street. This standard is met.

16.08.050 Flag lots in subdivisions.

Flag lots shall not be permitted within subdivisions except as approved by the community development director and in compliance with the following standards.

Response: Flag lots are not part of this application. These standards have been omitted from this written response.

16.08.055 Final subdivision plat—Application requirements and approval standards.

The applicant shall apply for final subdivision plat approval within twenty-four months following approval of a preliminary subdivision plat. The applicant shall apply for final plat approval to the city and shall pay the applicable fees as set forth on the city's adopted fee schedule. The final subdivision plat is processed as an administrative decision by the city so long as the final subdivision plat is consistent with the approved preliminary subdivision plat as conditioned by the decision-maker.

A. If the community development director determines that the final subdivision plat submitted by the applicant is not consistent with the approved preliminary subdivision plat, the modified subdivision shall be subject to the same Type II process and review standards as were applicable to the preliminary subdivision plat. However, if such a review is necessary, the review shall be limited only to those aspects of the final subdivision plat that deviate from the approved preliminary subdivision plat. The decision-maker's original approval of all other aspects of the subdivision may be relied upon as a conclusive determination of compliance with the applicable standards.

B. The community development director shall approve a final subdivision plat that is consistent with the approved preliminary subdivision plat, including any conditions attached thereto and required permits for access to facilities owned by another jurisdiction.

Response: A final subdivision plat, consistent with the approved preliminary plat, is planned to be submitted to the City prior to recordation. This standard is met.

Chapter 16.12 - MINIMUM IMPROVEMENTS AND DESIGN STANDARDS FOR LAND DIVISIONS

16.12.015 Street design—Generally.

Development shall demonstrate compliance with Chapter 12.04—Streets, Sidewalks and Public Places.

Response: Please refer to the written response provided to Chapter 12.04 for appropriate findings demonstrating compliance with the street design standards. This standard is met.

16.12.020 Blocks—Generally.

The length, width and shape of blocks shall take into account the need for adequate building site size, convenient motor vehicle, pedestrian, bicycle and transit access, control of traffic circulation, and limitations imposed by topography and other natural features.

Response: The planned lengths, widths, and shapes of blocks are largely determined by the continuation of existing streets, the development pattern abutting the subject property, and the zoning and configuration of the subject property itself. Public streets with sidewalks are planned to extend through the project to provide access to lots and future homes, and enhance neighborhood connectivity and circulation. As mentioned in the Pre-Application Summary, and addressed previously under Subsection 12.04.195 Spacing Standards, the project's "island" block created by the extension of the adjoining Skellenger Way and Tolstrup Drive, exceeds the maximum block length standard of 530 feet by approximately ±26 feet (±556 feet) requiring a midblock pedestrian connection between Skellenger Way and Tolstrup Drive. City staff have suggested in the Pre-Application Summary to include a modification to Subsection 12.04.195 to waive the required midblock pedestrian connection, which has been addressed previously in this narrative under Subsection 12.04.007 Modifications.

16.12.030 Blocks—Width.

The width of blocks shall ordinarily be sufficient to allow for two tiers of lots with depths consistent with the type of land use proposed.

Response: The widths of the planned blocks within the project will generally allow for two tiers of lots. New lots within the subdivision will average at a minimum, 8,000 square feet in area, pursuant to the requirements of the R-8 zone, and are planned to be suitable for single-family homes. This standard is met.

16.12.040 Building sites.

The size, width, shape and orientation of building sites shall be appropriate for the primary use of the land division, and shall be consistent with the residential lot size provisions of the zoning ordinance with the following exceptions:

Response: The size, width, depth, shape, and orientation of the planned lots comply with the requirements for the R-8 zoning district, and the resulting building sites are illustrated on the preliminary plans. This standard is met.

16.12.045 Building sites – Minimum density.

All subdivision layouts shall achieve at least eighty percent of the maximum density of the base zone for the net developable area as defined in Chapter 17.04.

Response: Density has been addressed previously in response to Section 16.08.030.F. This standard has been met.

16.12.050 Calculations of lot area.

A subdivision in the R-10, R-8, R-6, R-5, or R-3.5 dwelling district may include lots that are up to twenty percent less than the required minimum lot area of the applicable zoning designation provided the entire subdivision on average meets the minimum site area requirement of the underlying zone. The average lot area is determined by calculating the total site area devoted to dwelling units and dividing that figure by the proposed number of dwelling lots.

Accessory dwelling units are not included in this determination nor are tracts created for non-dwelling unit purposes such as open space, stormwater tracts, or access ways.

A lot that was created pursuant to this section may not be further divided unless the average lot size requirements are still met for the entire subdivision.

When a lot abuts a public alley, an area equal to the length of the alley frontage along the lot times the width of the alley right-of-way measured from the alley centerline may be added to the area of the abutting lot in order to satisfy the lot area requirement for the abutting lot. It may also be used in calculating the average lot area.

Response: The project includes 77 lots for the future construction of single-family detached homes in the R-8 zoning district. As permitted above, a number of the planned lots are less than 8,000 square feet. The smallest of the future lots is approximately ±6,406 square feet, which is within the maximum 20% reduction allowed by this standard. A number of the planned lots are also larger than 8,000 square feet with the largest lot being ±26,814 square feet. The average lot area is ±8,279 square feet, which exceeds the minimum square footage requirement of the R-8 zone. This standard is met.

16.12.055 Building site—Through lots.

Through lots and parcels shall be avoided except where they are essential to provide separation of residential development from major arterials or to overcome specific disadvantages of topography of existing development patterns. A reserve strip may be required. A planting screen restrictive covenant may be required to separate residential development from major arterial streets, adjacent nonresidential development, or other incompatible use, where practicable. Where practicable, alleys or shared driveways shall be used for access for lots that have frontage on a collector or minor arterial street, eliminating through lots.

Response: No through lots are planned within the project. This standard does not apply.

16.12.060 Building site—Lot and parcel side lines.

The lines of lots and parcels, as far as is practicable, shall run at right angles to the street upon which they face, except that on curved streets they shall be radial to the curve.

Response: Lot lines, as far as is practicable, run at right angles to the street upon which they face. Please see the preliminary plans for additional information. This standard is met.

16.12.065 Building site—Grading.

Grading of building sites shall conform to the State of Oregon Structural Specialty Code, Chapter 18, any approved grading plan and any approved residential lot grading plan in accordance with the requirements of Chapter 15.48, 16.12 and the Public Works Stormwater and Grading Design Standards, and the erosion control requirements of Chapter 17.47.

Response: The preliminary plans show project grading, including building site grading (where appropriate). The preliminary plans demonstrate that Chapter 15.48, Chapter 16.12, the Public Works Stormwater and Grading Design Standards, and the erosion control

requirements of Chapter 17.47 are met. Please refer to the preliminary plans for additional information.

16.12.070 Building site—Setbacks and building location.

This standard ensures that lots are configured in a way that development can be oriented toward streets to provide a safe, convenient and aesthetically pleasing environment for pedestrians and bicyclists. The objective is for lots located on a neighborhood collector, collector or minor arterial street locate the front yard setback on and design the most architecturally significant elevation of the primary structure to face the neighborhood collector, collector or minor arterial street.

A. The front setback of all lots located on a neighborhood collector, collector or minor arterial shall be orientated toward the neighborhood collector, collector or minor arterial street.

Response: This project does not include neighborhood collector, collector, or minor arterial streets. This criterion does not apply.

B. The most architecturally significant elevation of the house shall face the neighborhood collector, collector or minor arterial street.

Response: This project does not include neighborhood collector, collector, or minor arterial streets. This criterion does not apply.

C. On corner lots located on the corner of two local streets, the main façade of the dwelling may be oriented towards either street.

Response: Future homes on corner lots will have their main façades oriented toward one of the abutting streets. This criterion is met.

D. All lots proposed with a driveway and lot orientation on a collector or minor arterial shall combine driveways into one joint access per two or more lots unless the city engineer determines that:

1. No driveway access may be allowed since the driveway(s) would cause a significant traffic safety hazard; or

2. Allowing a single driveway access per lot will not cause a significant traffic safety hazard.

Response: This project does not include collector or minor arterial streets. This criterion does not apply.

E. The community development director may approve an alternative design, consistent with the intent of this section, where the applicant can show that existing development patterns preclude the ability to practically meet this standard.

Response: All future homes in this project are planned to be oriented toward and take access from interior local streets. An alternative design is not necessary.

16.12.075 Building site—Division of lots.

Where a tract of land is to be divided into lots or parcels capable of redivision in accordance with this chapter, the community development director shall require an arrangement of lots, parcels

and streets which facilitates future redivision. In such a case, building setback lines may be required in order to preserve future right-of-way or building sites.

Response: As shown on the preliminary plans, a small number of the planned lots are large enough to be re-divided. However, the existing PGE easement running through the southeast portion of the project limit future building placement to those areas outside of the easement. Therefore, no additional lots created for the construction of single-family dwellings is possible. This standard is satisfied.

16.12.080 Protection of trees.

Protection of trees shall comply with the provisions of Chapter 17.41—Tree Protection.

Response: Please refer to responses to individual criteria of Chapter 17.41 later in this narrative.

16.12.085 Easements.

The following shall govern the location, improvement and layout of easements:

A. Utilities. Utility easements shall be required where necessary as determined by the city engineer. Insofar as practicable, easements shall be continuous and aligned from block-to-block within the land division and with adjoining subdivisions or partitions. Specific utility easements for water, sanitary or storm drainage shall be provided based on approved final engineering plans.

B. Unusual Facilities. Easements for unusual facilities such as high voltage electric transmission lines, drainage channels and stormwater detention facilities shall be adequately sized for their intended purpose, including any necessary maintenance roads. These easements shall be shown to scale on the preliminary and final plats or maps. If the easement is for drainage channels, stormwater detention facilities or related purposes, the easement shall comply with the requirements of the Public Works Stormwater and Grading Design Standards.

C. Watercourses. Where a land division is traversed or bounded by a watercourse, drainageway, channel or stream, a stormwater easement or drainage right-of-way shall be provided which conforms substantially to the line of such watercourse, drainageway, channel or stream and is of a sufficient width to allow construction, maintenance and control for the purpose as required by the responsible agency. For those subdivisions or partitions which are bounded by a stream of established recreational value, setbacks or easements may be required to prevent impacts to the water resource or to accommodate pedestrian or bicycle paths.

D. Access. When easements are used to provide vehicular access to lots within a land division, the construction standards, but not necessarily width standards, for the easement shall meet city specifications. The minimum width of the easement shall be twenty feet. The easements shall be improved and recorded by the applicant and inspected by the city engineer. Access easements may also provide for utility placement.

E. Resource Protection. Easements or other protective measures may also be required as the community development director deems

necessary to ensure compliance with applicable review criteria protecting any unusual significant natural feature or features of historic significance.

Response: All appropriate utility easements are planned to be provided on the final subdivision plat. This standard is satisfied.

16.12.090 Minimum improvements—Procedures.

In addition to other requirements, improvements installed by the applicant either as a requirement of these or other regulations, or at the applicant's option, shall conform to the requirements of this title and be designed to city specifications and standards as set out in the city's facility master plan and Public Works Stormwater and Grading Design Standards. The improvements shall be installed in accordance with the following procedure:

A. Improvement work shall not commence until construction plans have been reviewed and approved by the city engineer and to the extent that improvements are in county or state right-of-way, they shall be approved by the responsible authority. To the extent necessary for evaluation of the proposal, the plans may be required before approval of the preliminary plat of a subdivision or partition. Expenses incurred thereby shall be borne by the applicant and paid for prior to final plan review.

B. Improvements shall be constructed under the inspection and approval of the city engineer. Expenses incurred thereby shall be borne by the applicant and paid prior to final approval. Where required by the city engineer or other city decision-maker, the applicant's project engineer also shall inspect construction.

C. Erosion control or resource protection facilities or measures are required to be installed in accordance with the requirements of Chapter 17.49 and the Public Works Erosion and Sediment Control Standards. Underground utilities, waterlines, sanitary sewers and storm drains installed in streets shall be constructed prior to the surfacing of the streets. Stubs for service connections for underground utilities and sanitary sewers shall be placed beyond the public utility easement behind to the lot lines.

D. As-built construction plans and digital copies of as-built drawings shall be filed with the city engineer upon completion of the improvements.

E. The city engineer may regulate the hours of construction and access routes for construction equipment to minimize impacts on adjoining residences or neighborhoods.

Response: The preliminary plans show the public improvements for this project. Work is planned to commence when construction plans have been reviewed and approved by the City Engineer. Inspections of the planned improvements, including erosion control measures are required. Upon completion of the improvements, as-built drawings are planned to be filed with the City Engineer.

16.12.095 Minimum improvements—Public facilities and services.

The following minimum improvements shall be required of all applicants for a land division under Title 16, unless the decision-

maker determines that any such improvement is not proportional to the impact imposed on the city's public systems and facilities:

A. Transportation System. Applicants and all subsequent lot owners shall be responsible for improving the city's planned level of service on all public streets, including alleys within the land division and those portions of public streets adjacent to but only partially within the land division. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for street improvements that benefit the applicant's property. Applicants are responsible for designing and providing adequate vehicular, bicycle and pedestrian access to their developments and for accommodating future access to neighboring undeveloped properties that are suitably zoned for future development. Storm drainage facilities shall be installed and connected to off-site natural or man-made drainageways. Upon completion of the street improvement survey, the applicant shall reestablish and protect monuments of the type required by ORS 92.060 in monument boxes with covers at every public street intersection and all points or curvature and points of tangency of their center line, and at such other points as directed by the city engineer.

Response: Public streets with sidewalks are planned within the project to provide access to the lots/future homes of the project and provide for neighborhood connectivity/circulation. As shown on the preliminary plans, this project will result in fully-improved streets extending from adjoining residential projects to accommodate all modes of travel. Monument boxes at street centerline intersections and other required locations are planned to be installed and/or protected. This standard is met.

B. Stormwater Drainage System. Applicants shall design and install drainage facilities within land divisions and shall connect the development's drainage system to the appropriate downstream storm drainage system as a minimum requirement for providing services to the applicant's development. The applicant shall obtain county or state approval when appropriate. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for stormwater drainage improvements that benefit the applicant's property. Applicants are responsible for extending the appropriate storm drainage system to the development site and for providing for the connection of upgradient properties to that system. The applicant shall design the drainage facilities in accordance with city drainage master plan requirements, Chapter 13.12 and the Public Works Stormwater and Grading Design Standards.

Response: The preliminary plans and the Preliminary Stormwater Report illustrate how on-site stormwater is planned to be collected and conveyed to Tract B, which is to be developed as a public stormwater facility. Stormwater is planned to be detained and treated in the stormwater facility and discharged to an existing drainage channel to the south of the project site. For additional information, please refer to the preliminary plans and Preliminary Stormwater Report included in the application materials. This standard is met.

C. Sanitary Sewer System. The applicant shall design and install a sanitary sewer system to serve all lots or parcels within a land division in accordance with the city's sanitary sewer design

standards, and shall connect those lots or parcels to the city's sanitary sewer system, except where connection is required to the county sanitary sewer system as approved by the county. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for sanitary sewer improvements that benefit the applicant's property. Applicants are responsible for extending the city's sanitary sewer system to the development site and through the applicant's property to allow for the future connection of neighboring undeveloped properties that are suitably zoned for future development. The applicant shall obtain all required permits and approvals from all affected jurisdictions prior to final approval and prior to commencement of construction. Design shall be approved by the city engineer before construction begins.

Response: This application includes the extension of the existing 8-inch sanitary sewer main located in Orchard Grove Drive through the project. Each lot within the project is planned to be provided an individual service lateral from the extended 8-inch sanitary sewer main. Planned sanitary sewer improvements will be available for the future connection of neighboring undeveloped properties suitable for future development. This standard is met.

D. Water System. The applicant shall design and install a water system to serve all lots or parcels within a land division in accordance with the city public works water system design standards, and shall connect those lots or parcels to the city's water system. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for water improvements that benefit the applicant's property. Applicants are responsible for extending the city's water system to the development site and through the applicant's property to allow for the future connection of neighboring undeveloped properties that are suitably zoned for future development.

Response: This application plans to extend the existing 8-inch water main located in Orchard Grove Drive through the project and connect to existing water mains located in Larence Lane, Skellenger Way, and Tolstrup Drive to create a looped water system. Each lot is planned to be provided with an individual meter and water lateral from the extended 8-inch water main. The extension of the planned water system will allow for the future connection of undeveloped abutting properties. This standard is met.

E. Sidewalks. The applicant shall provide for sidewalks on both sides of all public streets, on any private street if so required by the decision-maker, and in any special pedestrian way within the land division. Exceptions to this requirement may be allowed in order to accommodate topography, trees or some similar site constraint. In the case of major or minor arterials, the decision-maker may approve a land division without sidewalks where sidewalks are found to be dangerous or otherwise impractical to construct or are not reasonably related to the applicant's development. The decision-maker may require the applicant to provide sidewalks concurrent with the issuance of the initial building permit within the area that is the subject of the land division application. Applicants for partitions may be allowed to meet this requirement by executing a binding

agreement to not remonstrate against the formation of a local improvement district for sidewalk improvements that benefit the applicant's property.

Response: As shown on the preliminary plans, the planned street system includes public sidewalks on both sides of the project's interior streets. This will provide convenient pedestrian and bicycle access and connectivity between neighborhoods and other pedestrian destinations in the area for existing and future residents, which meets the intent of the "Proposed Metro Regional Trail," indicated on the Oregon City Conceptual Trails Map and shown on the preliminary plans.

F. Bicycle Routes. If appropriate to the extension of a system of bicycle routes, existing or planned, the decision-maker may require the installation of separate bicycle lanes within streets and separate bicycle paths.

Response: The planned street system, which includes public sidewalks, provides convenient pedestrian and bicycle access and connectivity. Pedestrian/bicycle specific connections, other than as shown, are not necessary. This standard is met.

G. Street Name Signs and Traffic Control Devices. The applicant shall install street signs and traffic control devices as directed by the city engineer. Street name signs and traffic control devices shall be in conformance with all applicable city regulations and standards.

Response: Street name signs and stop signs are planned to be installed for new and continued streets, as required by City Engineering staff in compliance with applicable regulations and standards. This standard is met.

H. Street Lights. The applicant shall install street lights which shall be served from an underground source of supply. Street lights shall be in conformance with all city regulations.

Response: Street lights are planned to be installed along new and continued streets in conformance with applicable regulations as required. This standard is met.

I. Street Trees. Refer to Chapter 12.08, Street Trees.

Response: Street trees are addressed in the responses to Section 12.08, above. This standard is met.

J. Bench Marks. At least one bench mark shall be located within the subdivision boundaries using datum plane specified by the city engineer.

Response: The final subdivision plat will reference a benchmark utilizing the datum plane specified by the City Engineer, if required. This standard is met.

K. Other. The applicant shall make all necessary arrangements with utility companies or other affected parties for the installation of underground lines and facilities. Electrical lines and other wires, including but not limited to communication, street lighting and cable television, shall be placed underground.

Response: All appropriate easements are planned to be provided for public and private utility providers. Arrangements with utility providers for the installation of these facilities is planned. This standard is met.

L. Oversizing of Facilities. All facilities and improvements shall be designed to city standards as set out in the city's facility master plan, public works design standards, or other city ordinances or regulations. Compliance with facility design standards shall be addressed during final engineering. The city may require oversizing of facilities to meet standards in the city's facility master plan or to allow for orderly and efficient development. Where oversizing is required, the applicant may request reimbursement from the city for oversizing based on the city's reimbursement policy and funds available, or provide for recovery of costs from intervening properties as they develop.

Response: Properly sized public facilities are planned to be provided throughout the project to serve future homes. All public improvements have been designed by a registered professional engineer which are planned to be reviewed and approved by City Engineering staff. This standard is met.

M. Erosion Control Plan—Mitigation. The applicant shall be responsible for complying with all applicable provisions of Chapter 17.47 with regard to erosion control.

Response: Erosion control is addressed in the response to Chapter 17.47. This standard is met.

Title 17 – ZONING

Chapter 17.10 - R-8 SINGLE-FAMILY DWELLING DISTRICT

17.10.020 Permitted uses.

Permitted uses in the R-8 district are:

A. Single-family detached residential units;

Response: This subdivision application includes 77 lots located in the R-8 zoning district for the future construction of single-family detached homes. This is recognized as a permitted use in the zone. This standard is met.

17.10.040 Dimensional standards.

Dimensional Standards in the R-8 District are:

A. Minimum lot areas, eight thousand square feet;

Response: The preliminary plans show that the average lot area in this project is approximately ±8,279 square feet. In the responses to Section 16.12.050, several of the planned lots are shown to be less than 8,000 square feet, but the average lot area across the project is approximately ±8,279 square feet. This standard is met.

B. Minimum lot width, sixty feet;

Response: As shown on the preliminary plans, all lots are planned to be at least 60 feet in width. This standard is met.

C. Minimum lot depth, seventy-five feet;

Response: As shown on the preliminary plans, all lots are planned to be at least 75 feet in depth. This standard is met.

D. Maximum building height, two and one-half stories, not to exceed thirty-five feet;

E. Minimum Required Setbacks:

1. Front yard fifteen feet minimum setback;

2. Front porch, ten feet minimum setback;

3. Attached and detached garage, twenty feet minimum setback from the public right-of-way where access is taken, except for alleys. Detached garages on an alley shall be setback a minimum of five feet in residential areas;

4. Interior side yard, nine feet minimum setback for at least one side yard, seven feet minimum setback for the other side yard;

5. Corner side yard, fifteen feet minimum setback;

6. Rear yard, twenty feet minimum setback;

7. Rear porch, fifteen feet minimum setback.

F. Garage Standards: See Chapter 17.20—Residential Design and Landscaping Standards.

G. Maximum Lot Coverage: The footprint of all structures two hundred square feet or greater shall cover a maximum of forty percent of the lot area.

Response: Future homes within the project are planned to comply with the above-listed maximum height, setback, and lot coverage requirements. The preliminary plans show required setbacks for future dwellings, which are planned to be reviewed for compliance at the time of building permit issuance. These standards are met.

Chapter 17.20 - RESIDENTIAL DESIGN AND LANDSCAPING STANDARDS

17.20.015 Street trees.

All new single or two-family dwellings or additions of twenty-five percent or more of the existing square footage of the home (including the living space and garage(s)) shall install a street tree along the frontage of the site, within the abutting developed right-of-way. Existing trees may be used to meet this requirement. A picture of the planted tree shall be submitted to the planning division prior to issuance of occupancy. Upon approval by the community development director, when a planter strip is not present, a tree may be placed within an easement on the abutting private property within ten feet of the public right-of-way if a covenant is recorded for the property with the Clackamas County Recorders Office identifying the tree as a city street tree, subject to the standards in Chapter 12.08 of the Oregon City Municipal Code. The street tree shall be a minimum of two-inches in caliper and either selected from the Oregon City Street Tree List or approved by a certified arborist for the planting location.

Response: As discussed previously, and as shown on the preliminary plans, street trees are planned to be planted along all streets within the project at such time as a building permit is issued and a home is approved for final inspection and occupancy. This standard is met.

17.20.020 Applicability.

The standards in Sections 17.20.030 through 17.20.050 apply to the street-facing facades of all single and two-family dwellings. New dwellings, new garages or expansions of an existing garage require compliance with one of the residential design options in [Section] 17.20.030 or Chapter 17.21.

For the purpose of this chapter, garages are defined as structures, or portions thereof used or designed to be used for the parking of vehicles, including carports. The garage width shall be measured based on the foremost interior garage walls or carport cover. The community development director may approve an alternative measurement location if the exterior facade screens a section of the garage or better accomplishes the goals of this chapter.

Response: This application is for approval of 77 residential lots for the future construction of detached single-family homes. Therefore, the standards of Sections 17.20.030 through 17.20.050 are addressed below.

17.20.030 Residential design options.

A. A dwelling with no garage or a detached garage shall comply with five of the residential design elements in [Section] 17.20.040.A on the front facade of the structure.

Response: Attached garages are planned for each of the future homes constructed on the lots within the project. This standard does not apply.

B. A dwelling without a garage on the primary street-facing facade may be permitted if shall include five of the residential design elements in [Section] 17.20.040A. on the front facade of the structure.

Response: All garages for future homes are planned to be provided on the primary street-facing façade of each home. This standard does not apply.

C. A dwelling with a front garage where the building is less than twenty-four feet wide may be permitted if:

1. The garage is no more than twelve feet wide and;

2. The garage does not extend closer to the street than the furthest forward living space on the street-facing facade; and

3. Six of the residential design elements in [Section] 17.20.040A. are included on the front facade of the structure; and

4. One of the following is provided:

a. Interior living area above the garage is provided. The living area must be set back no more than four feet from the street-facing garage wall; or

b. A covered balcony above the garage is provided. The covered balcony must be at least the same length as the street-facing garage wall, at least six feet deep and accessible from the interior living area of the dwelling unit; or

c. The garage is rear loaded.

Response: No future home associated with this project is planned to be less than 24 feet wide. This standard does not apply.

> **D.** A dwelling with a garage that extends up to fifty percent of the length of the street-facing facade and is not closer to the street than the furthest forward living space on the street-facing facade may be permitted if:
>
> Six of the residential design elements in [Section] 17.20.040A. are included on the front facade of the structure.
>
> (***)

Response: Individual single-family home designs have not been identified for individual lots. These standards are planned to be satisfied at the time building permits are issued.

> **17.20.035** Corner lots and through lots.
>
> **A.** Homes on corner lots and through lots shall comply with one of the options in [Section] 17.20.030 for the front of the home.
>
> **B.** The other street-facing side of the home shall include the following:
>
> **1.** Windows and doors for a minimum of fifteen percent of the lineal length of the ground floor facade; and
>
> **2.** Minimum four-inch window trim; and
>
> **3.** Three additional residential design elements selected from [Section] 17.20.040A.

Response: Individual single-family home designs have not been identified for individual lots within the project. These standards can be satisfied at the time building permits are issued.

> **17.20.040** Residential design elements.

Response: Individual single-family home designs have not been identified for individual lots within the project. The design elements indicated in this standard can be satisfied at the time building permits are issued.

> **17.20.050** Main entrances.
>
> The main entrance for each structure shall:
>
> **A.** Face the street; or
>
> **B.** Be at an angle up to forty-five degrees from the street;
>
> **C.** Open onto a covered porch that is at least sixty square feet with a minimum depth of five feet on the front or, in the case of a corner lot, the side of the home.

Response: Individual single-family home designs have not been identified for individual lots within the project. The design elements indicated in this standard can be satisfied at the time building permits are issued.

> **17.20.060** Residential yard landscaping.
>
> The intent of this section is to ensure that residential lots are landscaped and to encourage the retention of trees, minimize the impact of tree loss during development and ensure a sustainable tree

canopy in Oregon City. Though not required, the use of native species and low water use vegetation is recommended, but in no case may materials identified on the Oregon City Nuisance Plant list be used.

A. Tree Requirement. This requirement may be met using one or any combination of the three options below (Tree Preservation, Tree Planting, or Tree Fund). Table 17.20.060(A) identifies the minimum number of inches of tree diameter per lot that shall be preserved, planted or paid into the Tree Fund. Adjustments from this section are prohibited. The applicant shall submit a residential yard landscaping plan for Options (1) and (2) demonstrating compliance with the requirements of this section.

TABLE 17.20.060(A) - Tree Requirements	
Lot Size (square feet)	Tree Diameter Inches Required to be Protected, Planted or Paid into Tree Fund
0—4,999	4"
5,000—7,999	6"
8,000—9,999	8"
10,000—14,999	10"
15,000 +	12"

1. Tree preservation. The size of existing trees to be preserved shall be measured as Diameter at Breast Height (DBH).

   a. This standard shall be met using trees that are located on the lot and trees that are located within public and private right-of-way shall not be used to meet this standard. When this option is used, a tree preservation plan is required.

   b. Trees to be preserved may be located anywhere on the lot, and shall be a minimum of two inches caliper DBH.

   c. Large Native or Heritage Tree Incentive. If a tree is preserved that is selected from the list in Table 17.20.060(A)(2)(c), the diameter of the tree may be doubled when demonstrating compliance with the minimum tree requirements indicated in Table 17.20.060(A) above. For example, an Oregon White Oak with a two-inch caliper at DBH may count as a tree diameter of four inches.

Response: It is not possible to save all the existing trees for the use of residential yard landscaping based on the location of existing trees on the project site, and the planned layout of the project. This option will not be used to meet this Subsection.

2. Tree planting. All planted trees shall measure a minimum two-inch caliper at six inches above the root crown. When this option is used, a tree planting plan is required.

a. Trees planted pursuant to this section on R-6, R-8 and R-10 zoned lots shall include at least one tree in the front yard setback, unless it is demonstrated that it is not feasible due to site constraints.

b. Trees planted pursuant to this section on R-5 and R-3.5 zoned lots may be planted anywhere on the lot as space permits.

c. Large Native or Heritage Tree Incentive. If a tree is planted that is selected from the list in Table 17.20.060(A)(2)(c), the diameter of the tree may be doubled when demonstrating compliance with the minimum tree requirements indicated in Table 17.20.060(A) above. For example, an Oregon White Oak with a two-inch caliper at six inches above the root crown may count as a tree diameter of four inches.

TABLE 17.20.060(A)(2)(c) - Large Native and Heritage Tree List	
Common Name	**Scientific Name**
Oregon White Oak	*Quercus garryana*
Pacific willow	*Salix lucida spp. lasiandra*
Western red cedar	*Thuja plicata*
Western hemlock	*Tsuga heterophylla*
Northern Red Oak	*Quercus rubra*
Bur Oak	*Quercus macrocarpa*
Bigleaf Maple	*Acer macrophyllum*
Grand Fir	*Abies grandis*
Douglas Fir	*Pseudotsuga menziesii*
American Elm hybrids (disease resistant)	*Ulmus spp.*
Western yew	*Taxus brevifolia*

3. Tree Fund. This option may be used where site characteristics or construction preferences do not support the preservation or planting options identified above. The community development director may approve this option in-lieu-of or in addition to requirements 1. and/or 2. above. In this case, the community development director may approve the payment of cash-in-lieu into a dedicated fund for the remainder of trees that cannot be replanted in the manner described above. The large native or heritage tree incentive does not apply when using this option to calculate the number of required inches.

a. The cash-in-lieu payment per tree shall utilize the adopted fee schedule when calculating the total tree fund payment.

b. The amount to be paid to the tree fund shall be calculated by subtracting the total inches of trees preserved and planted per subsection 2. and 3. above from the minimum tree diameter inches required in Table 17.20.060(A), dividing the sum by two inches and multiplying the remainder by the adopted fee from the Oregon City fee schedule. For example:

Lot Size	a. Tree Requirement per Table 17.20.060(A) (inches)	b. Trees Preserved (inches)	c. Trees Planted (inches)	d. To be mitigated (inches) a.—b.—c.	Number of trees owed to tree fund. d./2" minimum caliper tree
10,000—14,999	10"	2"	4"	4"	2

Response: The applicant plans to use a combination of the "Tree Planting" option and the "Tree Fund" option to meet the residential yard landscaping requirement. Individual home designs for the planned lots have not been identified at this time. A residential yard landscaping plan is planned to be developed based off future home design and placement, and submitted prior to building permit applications.

B. Residential front yard landscaping requirements. The following minimum landscaping standards shall apply to residential uses in residential zones:

1. At a minimum, a three-gallon shrub or three-gallon accent plant shall be planted between the front property line and the front building line for every four linear feet of foundation.

2. On lots zoned R-5, R-6, R-8 and R-10, fifty percent of the area between the front lot line and the front building line shall be landscaped.

3. On lots zoned R-3.5, at least forty percent of the area between the front lot line and the front building line shall be landscaped.

4. At a minimum, the required landscaped area shall be planted with ground cover. Up to one-third of the required landscaped area may be for recreational use or for use by pedestrians, such as walkways, play areas or patios.

5. A landscaping plan is required.

Response: Individual home designs for the planned lots have not been identified at this time. A residential yard landscaping plan is planned to be developed based off future home design and placement, and submitted prior to building permit applications.

Chapter 17.41 - TREE PROTECTION STANDARDS

17.41.040 Same—Exemptions.

These regulations are not intended to regulate normal cutting, pruning and maintenance of trees on private property except where

trees are located on lots that are undergoing development review or are otherwise protected within the Natural Resource Overlay District (NROD) of section 17.49. These standards are not intended to regulate farm and forest practices as those practices are defined under ORS 30.930. Farm or forest resources. An applicant for development may claim exemption from compliance with these standards if the development site containing the regulated grove or trees was a designated farm or forest use, tree farm, Christmas tree plantation, or other approved timber use within one year prior to development application. "Forest practices" and "forestlands" as used in this subsection shall have the meaning as set out in ORS 30.930. The community development director has the authority to modify or waive compliance in this case.

Response: The project site has historically been used as a farm, as evidenced by the Farm Deferral tax status shown on the 2016 Property Tax Statements for Tax Lots 1001, 1100, and 1700 included in the application materials. More specifically, the property has been used as a hazelnut and Christmas tree farm, and is currently occupied with both hazelnut and Christmas trees. A number of stands of the larger trees located on the property were originally planted as Christmas trees that were never harvested. The hazelnut trees have been overcome with Eastern Filbert Blight, a common disease among hazelnut orchards that is spread during wet weather. The existing hazelnut trees have been deemed "diseased" by a certified arborist, as addressed in the project's Arborist Report. Based on the project site's farm use status within one year of this application, the trees mentioned in this response are considered exempt from Chapter 17.41 and are not included in the project's mitigation calculation.

17.41.050 Same—Compliance options.

Applicants for review shall comply with these requirements through one or a combination of the following procedures:

A. Option 1—Mitigation. Retention and removal of trees, with subsequent mitigation by replanting pursuant to Sections 17.41.060 or 17.41.070. All replanted and saved trees shall be protected by a permanent restrictive covenant or easement approved in form by the city.

D. Option 4—Cash-in-lieu of planting pursuant to Section 17.41.130.

A regulated tree that has been designated for protection pursuant to this section must be retained or permanently protected unless it has been determined by a certified arborist to be diseased or hazardous, pursuant to the following applicable provisions.

The community development director, pursuant to a Type II procedure, may allow a property owner to cut a specific number of trees within a regulated grove if preserving those trees would:

1. Preclude achieving eighty percent of minimum density with reduction of lot size; or

2. Preclude meeting minimum connectivity requirements for subdivisions.

Response: Based on the health of the trees, as detailed in the "Detailed Tree Inventory" Located in the preliminary plans, 9 trees are subject to mitigation. Using Table 17.41.060-1 (Tree Replacement Requirements) to calculate the number of trees required for mitigation, 36

mitigation trees are required. This application chooses to use a combination of Option 1 and Option 4 to satisfy this requirement. A final tree mitigation plan is planned to be submitted based on the City's final decision.

17.41.060 Tree removal and replanting—Mitigation (Option 1).

A. Applicants for development who select this option shall ensure that all healthy trees shall be preserved outside the construction area as defined in Chapter 17.04 to the extent practicable. Compliance with these standards shall be demonstrated in a tree mitigation plan report prepared by a certified arborist, horticulturalist or forester or other environmental professional with experience and academic credentials in forestry or arborculture. At the applicant's expense, the city may require the report to be reviewed by a consulting arborist. The number of replacement trees required on a development site shall be calculated separately from, and in addition to, any public or street trees in the public right-of-way required under section 12.08—Community Forest and Street Trees.

B. The applicant shall determine the number of trees to be mitigated on the site by counting all of the trees six inch DBH (minimum four and one-half feet from the ground) or larger on the entire site and either:

1. Trees that are removed outside of the construction area, shall be replanted with the number of trees specified in Column 1 of Table 17.41.060-1. Trees that are removed within the construction area shall be replanted with the number of replacement trees required in Column 2; or

2. Diseased or hazardous trees, when the condition is verified by a certified arborist to be consistent with the definition in Section 17.04.1360, may be removed from the tree replacement calculation. Regulated healthy trees that are removed outside of the construction area, shall be replanted with the number of trees specified in Column 1 of Table 17.41.060-1. Regulated healthy trees that are removed within the construction area shall be replanted with the number of replacement trees required in Column 2.

Response: Of the trees to be removed, a total of 5 are located inside the construction area for project improvements. A total of 4 trees are located outside of the construction area.

Table 17.41.060-1 Tree Replacement Requirements All replacement trees shall be either: Two-inch caliper deciduous, or Six-foot high conifer		
Size of tree removed (DBH)	Column 1 Number of trees to be planted. (If removed Outside of construction area)	Column 2 Number of trees to be planted. (If removed Within the construction area)
6 to 12"	3	1
13 to 18"	6	2
19 to 24"	9	3
25 to 30"	12	4
31 and over"	15	5

Steps for calculating the number of replacement trees:

1. Count all trees measuring six inches DBH (minimum four and one-half feet from the ground) or larger on the entire development site.
2. Designate (in certified arborists report) the condition and size (DBH) of all trees pursuant to accepted industry standards.
3. Document any trees that are currently diseased or hazardous.
4. Subtract the number of diseased or hazardous trees in step 3. from the total number of trees on the development site in step 1. The remaining number is the number of healthy trees on the site. Use this number to determine the number of replacement trees in steps 5. through 8.
5. Define the construction area (as defined in Chapter 17.04).
6. Determine the number and diameter of trees to be removed within the construction area. Based on the size of each tree, use Column 2 to determine the number of replacement trees required.
7. Determine the number and diameter of trees to be removed outside of the construction area. Based on the size of each tree, use Column 1 to determine the number of replacement trees required.
8. Determine the total number of replacement trees from steps 6. and 7.

Response: Trees located on the project site were inventoried and evaluated by a professional certified arborist. Many of the trees on-site are either hazardous or diseased and need to be removed. Nine (9) trees to be removed are subject to mitigation, (4 trees located "outside of construction area" and 5 trees are located "inside of construction area"). Based on the size of the trees to be removed and their location relative to the "construction area," a total of 36 mitigation trees are planned to be planted per Option 1 or cash-in-lieu of planting paid per Option 4. This standard is met.

17.41.070 Planting area priority for mitigation (Option 1).

Development applications which opt for removal of trees with subsequent replanting pursuant to section 17.41.050A. shall be required to mitigate for tree cutting by complying with the following priority for replanting standards below:

A. First Priority. Replanting on the development site.

B. Second Priority. Off-site replacement tree planting locations. If the community development director determines that it is not practicable to plant the total number of replacement trees on-site, a suitable off-site planting location for the remainder of the trees may be approved that will reasonably satisfy the objectives of this section. Such locations may include either publicly owned or private land and must be approved by the community development director.

Response: Mitigation trees are planned to be planted on or off-site and/or cash-in-lieu of planting in accordance with this chapter. This standard is met.

17.41.125 Cash-in-lieu of planting (tree bank/fund) (Option 4).

The applicant may choose this option in-lieu-of or in addition to Compliance Options 1 through 3. In this case, the community development director may approve the payment of cash-in-lieu into a dedicated fund for the remainder of trees that cannot be replanted in the manner described above.

A. The cash-in-lieu payment per tree shall be as listed on the adopted fee schedule and shall be adjusted annually based on the Consumer Price Index (Index). The price shall include the cost of materials, transportation and planting.

B. The amount of the cash-in-lieu payment into the tree bank shall be calculated as the difference between the value of the total number of trees an applicant is required to plant, including cost of installation and adjusted for Consumer Price Index, minus the value of the trees actually planted. The value of the trees shall be based on the adopted fee schedule.

Response: Mitigation trees are planned to be planted on or off-site and/or cash-in-lieu of planting is to be paid in accordance with this Chapter. This standard is met.

17.41.130 Regulated tree protection procedures during construction.

A. No permit for any grading or construction of public or private improvements may be released prior to verification by the community development director that regulated trees designated for protection or conservation have been protected according to the following standards. No trees designated for removal shall be removed without prior written approval from the community development director.

Response: Tree protection in accordance with this standard is planned to be installed prior to any grading or construction associated with the project. This standard is met.

B. Tree protection shall be as recommended by a qualified arborist or, as a minimum, to include the following protective measures: …

Response: Tree protection measures for those trees to remain on the project site have been outlined in the project's Arborist Report and shown on the preliminary plans in accordance with the criteria of this standard. Grading and/or construction activity will not commence prior to the installation of planned tree protection. This standard is met.

C. Changes in soil hydrology due to soil compaction and site drainage within tree protection areas shall be avoided. Drainage and grading plans shall include provision to ensure that drainage of the site does not conflict with the standards of this section. Excessive site run-off shall be directed to appropriate storm drainage facilities and away from trees designated for conservation or protection.

Response: As shown on the preliminary plans and addressed in the Preliminary Stormwater Report, site drainage is not planned to conflict with those trees to be protected on the project site. All stormwater is planned to be directed to the project's storm drainage facility and away from trees designated for conservation and/or protection. This standard is met.

Chapter 17.44 - US—GEOLOGIC HAZARDS

17.44.025 When required; regulated activities; permit and approval requirements.

No person shall engage in any of the following regulated activities within the adopted Oregon City Geologic Hazards Overlay Zone as defined in section 17.04.515 of the Oregon City Municipal Code without first obtaining permits or approvals as required by this chapter:

A. Installation or construction of an accessory structure greater than 500 square feet in area;

B. Development of land, construction, reconstruction, structural alteration, relocation or enlargement of any building or structure for which permission is required pursuant to the Oregon City Municipal Code;

C. Tree removal on slopes greater than 25 percent where canopy area removal exceeds 25 percent of the lot.

D. Excavation which exceeds two feet in depth, or which involves twenty-five or more cubic yards of volume;

The requirements of this chapter are in addition to other provisions of the Oregon City Municipal Code. Where the provisions of this chapter conflict with other provisions of the Oregon City Municipal Code, the provisions that are the more restrictive of regulated development activity shall govern.

Response: The southeastern portion of the project site is within the adopted Oregon City Geologic Hazards Overlay Zone as defined in Section 17.04.515 of the OCMC. Activity in this area will not occur prior to first obtaining appropriate permits and/or approval as required by this standard. This standard is met.

17.44.030 Procedures.

No building or site development permit or other authorization for development shall be issued until the plans and other documents required by this chapter have been reviewed and found by the review authority to comply with the requirements of this chapter.

A. Where the development is part of a land use permit application, review shall occur in the manner established in Chapter 17.50 for review of land use decisions.

B. Where the development is part of a limited land use permit application, review shall occur in the manner established in Chapter 17.50 for review of limited land use decisions.

C. Where the development is solely part of a grading permit or building permit, the city engineer may allow review to occur in the manner established in Title 15, Chapters 15.04 and 15.48 if the application meets Section 17.44.060 development standards.

D. For any other proposed development not otherwise subject to review as a land use or limited land use permit application, review shall occur in the manner established in Chapter 17.50 for limited land use decisions.

Response: Activity within the portion of the project located in the Geologic Hazards Overlay Zone will not commence until appropriate approval is issued. This standard is met.

17.44.035 Exemptions.

The following activities, and persons engaging in same, are EXEMPT from the provisions of this chapter.

A. An excavation which is less than two feet in depth, or which involves less than twenty-five cubic yards of volume;

B. A fill which does not exceed two feet in depth or twenty-five cubic yards of volume;

C. Structural alteration of any structure of less than five hundred square feet that does not involve grading as defined in this chapter;

D. Installation, construction, reconstruction, or replacement of utility lines in city right-of-way, or public easement, not including electric substations;

E. The removal or control of noxious vegetation;

F. Emergency actions which must be undertaken immediately to prevent an imminent threat to public health or safety, or prevent imminent danger to public or private property. The person undertaking emergency action shall notify the building official on all regulated activities associated with any building permit or city engineer/public works director on all others within one working day following the commencement of the emergency activity. If the city engineer/public works director or building official determine that the action or part of the action taken is beyond the scope of allowed emergency action, enforcement action may be taken.

Response: This standard is understood.

17.44.050 Development—Application requirements and review procedures and approvals.

Except as provided by subsection B. of this section, the following requirements apply to all development proposals subject to this chapter:

A. A geological assessment and geotechnical report that specifically includes, but is not limited to: ….

Response: A Geotechnical Engineering Report and Preliminary Stormwater Report that include the information listed in this standard have been included in the application materials. This standard is met.

17.44.060 Development standards.

Notwithstanding any contrary dimensional or density requirements of the underlying zone, the following standards shall apply to the review of any development proposal subject to this chapter. Requirements of this chapter are in addition to other provision of the Oregon City Municipal Code. Where provision of this chapter conflict with other provision of the Oregon City Municipal Code, the provisions that are more restrictive of regulated development activity shall govern.

A. All developments shall be designed to avoid unnecessary disturbance of natural topography, vegetation and soils. To the maximum extent practicable as determined by the review authority, tree and ground cover removal and fill and grading for residential development on individual lots shall be confined to building footprints and driveways, to areas required for utility easements and for slope easements for road construction, and to areas of geotechnical remediation.

Response: The project has been designed to avoid unnecessary disturbance of natural topography, vegetation and soils. Grading as necessary to provide proper drainage, gravity sewer, future building footprints, their driveway areas, and areas required for placement of utilities. The preliminary layout of the project area has been based on recommendations

from the project's Geotechnical Engineering Report and Preliminary Stormwater Report. This standard is met.

> **B.** All grading, drainage improvements, or other land disturbances shall only occur from May 1 to October 31. Erosion control measures shall be installed and functional prior to any disturbances. The city engineer may allow grading, drainage improvements or other land disturbances to begin before May 1 (but no earlier than March 16) and end after October 31 (but no later than November 30), based upon weather conditions and in consultation with the project geotechnical engineer. The modification of dates shall be the minimum necessary, based upon the evidence provided by the applicant, to accomplish the necessary project goals. Temporary protective fencing shall be established around all trees and vegetation designed for protection prior to the commencement of grading or other soil disturbance.

Response: All construction activities associated with this project will occur between May 1st and October 31st. Prior to any land disturbance activities, appropriate erosion control measures and tree protection fencing is planned to be installed and approved by City staff. This standard is met.

> **C.** Designs shall minimize the number and size of cuts and fills.

Response: The number and size of cuts and fills associated with the project are planned to be minimized to the greatest extent possible. This standard is met.

> **D.** Cut and fill slopes, such as those for a street, driveway accesses, or yard area, greater than seven feet in height (as measured vertically) shall be terraced. Faces on a terraced section shall not exceed five feet. Terrace widths shall be a minimum of three feet and shall be vegetated. Total cut and fill slopes shall not exceed a vertical height of fifteen feet. Except in connection with geotechnical remediation plans approved in accordance with the chapter, cuts shall not remove the toe of any slope that contains a known landslide or is greater than twenty-five percent slope. The top of cut or fill slopes not utilizing structural retaining walls shall be located a minimum of one-half the height of the cut slope from the nearest property line.

Response: Cut and fill slopes are not planned to exceed 7 feet in height. This standard does not apply.

> **E.** Any structural fill shall be designed by a suitably qualified and experienced civil or geotechnical engineer licensed in Oregon in accordance with standard engineering practice. The applicant's engineer shall certify that the fill has been constructed as designed in accordance with the provisions of this chapter.

Response: This standard is understood. Structural fill is planned to be designed, inspected, and certified by the project's Civil Engineer. This standard is met.

> **F.** Retaining walls shall be constructed in accordance with the Oregon Structural Specialty Code adopted by the State of Oregon.

Response: This standard is understood. Any future retaining walls associated with the project are planned to be constructed in accordance with the Oregon Structural Specialty Code. This standard is met.

G. Roads shall be the minimum width necessary to provide safe vehicle and emergency access, minimize cut and fill and provide positive drainage control. The review authority may grant a variance from the city's required road standards upon findings that the variance would provide safe vehicle and emergency access and is necessary to comply with the purpose and policy of this chapter.

Response: As shown on the preliminary plans, all internal streets within the project have been designed to meet the minimum width requirements necessary to provide safe vehicle and emergency access. Cut and fill activities are minimized to the greatest extent possible and a Preliminary Stormwater Report has been included in the application materials that addresses drainage control. No variances are included in this application. This standard is met.

H. Density shall be determined as follows:

1. For those areas with slopes less than twenty-five percent between grade breaks, the allowed density shall be that permitted by the underlying zoning district;

2. For those areas with slopes of twenty-five to thirty-five percent between grade breaks, the density shall not exceed two dwelling units per acre except as otherwise provided in subsection I of this section;

3. For those areas with slopes over thirty-five percent between grade breaks, development shall be prohibited except as otherwise provided in subsection I.4. of this section.

Response: Project density has been addressed previously under Section 16.08.030.F, and has been determined with consideration of this standard.

I. For properties with slopes of twenty-five to thirty-five percent between grade breaks:

Response: As shown on the preliminary plans, the project does include slopes of twenty-five percent or greater. Therefore, the following criteria are addressed.

1. For those portions of the property with slopes of twenty-five to thirty-five percent, the maximum residential density shall be limited to two dwelling units per acre; provided, however, that where the entire site is less than one-half acre in size, a single dwelling shall be allowed on a lot or parcel existing as of January 1, 1994 and meeting the minimum lot size requirements of the underlying zone;

Response: Project density has taken this criterion into account for calculating minimum and maximum allowable density for the project. This criterion is met.

2. An individual lot or parcel with slopes between twenty-five and thirty-five percent shall have no more than fifty percent or four thousand square feet of the surface area, whichever is smaller, graded or stripped of vegetation or covered with structures or impermeable surfaces.

3. No cut into a slope of twenty-five to thirty-five percent for the placement of a housing unit shall exceed a maximum vertical height of fifteen feet for the individual lot or parcel.

4. For those portions of the property with slopes over thirty-five percent between grade breaks:

a. Notwithstanding any other city land use regulation, development other than roads, utilities, public facilities and geotechnical remediation shall be prohibited; provided, however, that the review authority may allow development upon such portions of land upon demonstration by an applicant that failure to permit development would deprive the property owner of all economically beneficial use of the property. This determination shall be made considering the entire parcel in question and contiguous parcels in common ownership on or after January 1, 1994, not just the portion where development is otherwise prohibited by this chapter. Where this showing can be made on residentially zoned land, development shall be allowed and limited to one single-family residence. Any development approved under this chapter shall be subject to compliance with all other applicable city requirements as well as any applicable state, federal or other requirements;

b. To the maximum extent practicable as determined by the review authority, the applicant shall avoid locating roads, utilities, and public facilities on or across slopes exceeding thirty-five percent.

Response: As shown on the preliminary plans, those areas of the project site that have slopes between 25% and 35% are planned to be left in their natural state. No grading, stripping of vegetation, or structures are planned in these areas. These criteria do not apply.

J. The geotechnical engineer of record shall review final grading, drainage, and foundation plans and specifications and confirm in writing that they are in conformance with the recommendations provided in their report.

Response: This standard is understood. The project's Geotechnical Engineer will confirm, in writing, that final grading, drainage, and foundation plans are in conformance with the recommendations provided in the project's Geotechnical Engineering Report. This standard is met.

K. At the city's discretion, peer review shall be required for the geotechnical evaluation/investigation report submitted for the development and/or lot plans. The peer reviewer shall be selected by the city. The applicant's geotechnical engineer shall respond to written comments provided by the city's peer reviewer prior to issuance of building permit.

Response: This standard is understood.

L. The review authority shall determine whether the proposed methods of rendering a known or potential hazard site safe for construction, including proposed geotechnical remediation methods, are feasible and adequate to prevent landslides or damage to property and safety. The review authority shall consult with the city's geotechnical engineer in making this determination. Costs for such consultation

shall be paid by the applicant. The review authority may allow development in a known or potential hazard area as provided in this chapter if specific findings are made that the specific provisions in the design of the proposed development will prevent landslides or damage. The review authority may impose any conditions, including limits on type or intensity of land use, which it determines are necessary to assure that landslides or property damage will not occur.

Response: This standard is understood.

17.44.070 Access to property.

A. Shared private driveways may be required if the city engineer or principal planner determines that their use will result in safer location of the driveway and lesser amounts of land coverage than would result if separate private driveways are used.

B. Innovations in driveway design and road construction shall be permitted in order to keep grading and cuts or fills to a minimum and to achieve the purpose and policy of this chapter.

C. Points of access to arterials and collectors shall be minimized.

D. The city engineer or principal planner shall verify that adequate emergency services can be provided to the site.

Response: This standard is understood.

17.44.080 Utilities.

All new service utilities, both on-site and off-site, shall be placed underground and under roadbeds where practicable. Every effort shall be made to minimize the impact of utility construction. Underground utilities require the geologic hazards permitting and review prescribed herein.

Response: All new utilities associated with the project are planned to be placed underground. This standard is met.

17.44.090 Stormwater drainage.

The applicant shall submit a permanent and complete stormwater control plan. The program shall include, but not be limited to the following items as appropriate: curbs, gutters, inlets, catch basins, detention facilities and stabilized outfalls. Detention facilities shall be designed to city standards as set out in the city's drainage master plan and design standards. The review authority may impose conditions to ensure that waters are drained from the development so as to limit degradation of water quality consistent with Oregon City's Title III section of the Oregon City Municipal Code Chapter 17.49 and the Oregon City Public Works Stormwater Management Design Manual and Standards Plan or other adopted standards subsequently adopted by the city commission. Drainage design shall be approved by the city engineer before construction, including grading or other soil disturbance, has begun.

Response: As shown on the preliminary plans, and detailed in the Preliminary Stormwater Report, the project's permanent stormwater control plan has been designed to City standards

and in compliance with the City's Drainage Master Plan and design standards. This standard is met.

17.44.100 Construction standards.

During construction on land subject to this chapter, the following standards shall be implemented by the developer:

A. **All development activity shall minimize vegetation removal and soil disturbance and shall provide positive erosion prevention measures in conformance with OCMC Chapter 17.47—Erosion and Sediment Control.**

B. **No grading, clearing or excavation of any land shall be initiated prior to approval of the grading plan, except that the city engineer shall authorize the site access, brush to be cleared and the location of the test pit digging prior to approval of such plan to the extent needed to complete preliminary and final engineering and surveying. The grading plan shall be approved by the city engineer as part of the city's review under this chapter. The developer shall be responsible for the proper execution of the approved grading plan.**

C. **Measures shall be taken to protect against landslides, mudflows, soil slump and erosion. Such measures shall include sediment fences, straw bales, erosion blankets, temporary sedimentation ponds, interceptor dikes and swales, undisturbed buffers, grooving and stair stepping, check dams, etc. The applicant shall comply with the measures described in the Oregon City Public Works Standards for Erosion and Sedimentation Control (Ordinance 99-1013).**

D. **All disturbed vegetation shall be replanted with suitable vegetation upon completion of the grading of the steep slope area.**

E. **Existing vegetative cover shall be maintained to the maximum extent practicable. No grading, compaction or change in ground elevation, soil hydrology and/or site drainage shall be permitted within the drip line of trees designated for protection, unless approved by the city.**

F. **Existing perennial and intermittent watercourses shall not be disturbed unless specifically authorized by the review authority. This includes physical impacts to the stream course as well as siltation and erosion impacts.**

G. **All soil erosion and sediment control measures shall be maintained during construction and for one year after development is completed, or until soils are stabilized by revegetation or other measures to the satisfaction of the city engineer. Such maintenance shall be the responsibility of the developer. If erosion or sediment control measures are not being properly maintained or are not functioning properly due to faulty installation or neglect, the City may order work to be stopped. (Ord. 03-1014, Att. B3 (part), 2003: Ord. 94-1001 §2(part), 1994)**

H. **All newly created lots, either by subdivision or partition, shall contain building envelopes with a slope of thirty-five percent or less.**

I. **The applicant's geotechnical engineer shall provide special inspection during construction to confirm that the subsurface conditions and assumptions made as part of their geotechnical evaluation/investigation are appropriate. This will allow for timely**

design changes if site conditions are encountered that are different from those anticipated.

J. Prior to issuing an occupancy permit, the geotechnical engineer shall prepare a summary letter stating that the soils- and foundation-related project elements were accomplished in substantial conformance with their recommendations.

Response: This standard is understood.

17.44.110 Approval of development.

The city engineer shall review the application and verify, based on the applicant's materials and the land use record, whether the proposed development constitutes a hazard to life, property, natural resources or public facilities. If, in the city engineer's opinion, a particular development poses such a hazard, the city engineer shall recommend to the review authority permit conditions designed to reduce or eliminate the hazard. These conditions may include, but are not limited to, prohibitions on construction activities between November 1st and March 31st.

Response: This standard is understood.

Chapter 17.47 - EROSION AND SEDIMENT CONTROL

17.47.070 Erosion and sediment control plans.

A. An application for an erosion and sediment control permit shall include an erosion and sediment control plan, which contains methods and interim measures to be used during and following construction to prevent or control erosion prepared in compliance with City of Oregon City public works standards for erosion and sediment control. These standards are incorporated herein and made a part of this title and are on file in the office of the city recorder.

B. Approval Standards. An erosion and sediment control plan shall be approved only upon making the following findings:

1. The erosion and sediment control plan meets the requirements of the City of Oregon City public works standards for erosion and sediment control incorporated by reference as part of this chapter;

2. The erosion and sediment control plan indicates that erosion and sediment control measures will be managed and maintained during and following development. The erosion and sediment control plan indicates that erosion and sediment control measures will remain in place until disturbed soil areas are permanently stabilized by landscaping, grass, approved mulch or other permanent soil stabilizing measures.

C. The erosion and sediment control plan shall be reviewed in conjunction with the requested development approval. If the development does not require additional review, the manager may approve or deny the permit with notice of the decision to the applicant.

D. The city may inspect the development site to determine compliance with the erosion and sediment control plan and permit.

E. Erosion that occurs on a development site that does not have an erosion and sediment control permit, or that results from a failure to comply with the terms of such a permit, constitutes a violation of this chapter.

F. If the manager finds that the facilities and techniques approved in an erosion and sediment control plan and permit are not sufficient to prevent erosion, the manager shall notify the owner or his/her designated representative. Upon receiving notice, the owner or his/her designated representative shall immediately install interim erosion and sediment control measures as specified in the City of Oregon City public works standards for erosion and sediment control. Within three days from the date of notice, the owner or his/her designated representative shall submit a revised erosion and sediment control plan to the city. Upon approval of the revised plan and issuance of an amended permit, the owner or his/her designated representative shall immediately implement the revised plan.

G. Approval of an erosion and sediment control plan does not constitute an approval of permanent road or drainage design (e.g., size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).

Response: A Preliminary Grading and Erosion and Sediment Control Plan is included in the preliminary plans. The plan includes measures to ensure that sediment laden waters will not leave the site. A Final Grading and Erosion and Sediment Control Plan is planned to be submitted and approved before any construction activities commence. Please refer to the preliminary plans for further information.

Chapter 17.50 - ADMINISTRATION

17.50.050 Preapplication conference.

A. Preapplication Conference. Prior to submitting an application for any form of permit, the applicant shall schedule and attend a preapplication conference with City staff to discuss the proposal. To schedule a preapplication conference, the applicant shall contact the Planning Division, submit the required materials, and pay the appropriate conference fee. At a minimum, an applicant should submit a short narrative describing the proposal and a proposed site plan, drawn to a scale acceptable to the City, which identifies the proposed land uses, traffic circulation, and public rights-of-way and all other required plans. The purpose of the preapplication conference is to provide an opportunity for staff to provide the applicant with information on the likely impacts, limitations, requirements, approval standards, fees and other information that may affect the proposal. The Planning Division shall provide the applicant(s) with the identity and contact persons for all affected neighborhood associations as well as a written summary of the preapplication conference. Notwithstanding any representations by City staff at a preapplication conference, staff is not authorized to waive any requirements of this code, and any omission or failure by

staff to recite to an applicant all relevant applicable land use requirements shall not constitute a waiver by the City of any standard or requirement.

B. A preapplication conference shall be valid for a period of six months from the date it is held. If no application is filed within six months of the conference or meeting, the applicant must schedule and attend another conference before the city will accept a permit application. The community development director may waive the preapplication requirement if, in the Director's opinion, the development does not warrant this step. In no case shall a preapplication conference be valid for more than one year.

Response: On November 3, 2016, the applicant's consultant submitted a request for a pre-application conference on the required form, and included a short explanatory narrative, preliminary site plan, and the appropriate fee. The pre-application conference was held on December 6, 2016. The original pre-application conference summary, including updated summary dated December 28, 2016, provided by Oregon City Planning and Development Services are included in the application materials. The subdivision application was filed with the City within six months of the pre-application conference. These criteria are met.

17.50.055 Neighborhood association meeting.

A. Neighborhood Association Meeting. The purpose of the meeting with the recognized neighborhood association is to inform the affected neighborhood association about the proposed development and to receive the preliminary responses and suggestions from the neighborhood association and the member residents.

1. Applicants applying for annexations, zone change, comprehensive plan amendments, conditional use, planning commission variances, subdivision, or site plan and design review (excluding minor site plan and design review), general development master plans or detailed development plans applications shall schedule and attend a meeting with the city-recognized neighborhood association in whose territory the application is proposed. Although not required for other projects than those identified above, a meeting with the neighborhood association is highly recommended.

2. The applicant shall send, by certified mail, return receipt requested letter to the chairperson of the neighborhood association and the citizen involvement committee describing the proposed project. Other communication methods may be used if approved by the neighborhood association.

3. A meeting shall be scheduled within thirty days of the notice. A meeting may be scheduled later than thirty days if by mutual agreement of the applicant and the neighborhood association. If the neighborhood association does not want to, or cannot meet within thirty days, the applicant shall hold their own meeting after six p.m. or on the weekend, with notice to the neighborhood association, citizen involvement committee, and all property owners within three hundred feet. If the applicant holds their own meeting, a copy of the certified letter requesting a neighborhood association meeting shall be required for a complete application. The meeting held by the applicant shall be held within the boundaries of the neighborhood association or in a city facility.

4. If the neighborhood association is not currently recognized by the city, is inactive, or does not exist, the applicant shall request a meeting with the citizen involvement committee.

5. To show compliance with this section, the applicant shall submit a sign-in sheet of meeting attendees, a summary of issues discussed, and letter from the neighborhood association or citizen involvement committee indicating that a neighborhood meeting was held. If the applicant held a separately noticed meeting, the applicant shall submit a copy of the meeting flyer, a sign in sheet of attendees and a summary of issues discussed.

Response: Upon receiving approval to communicate with the South End Neighborhood Association (SENA) via email, the applicant's consultant sent an email to SENA Chair Bill McConnel on March 15, 2017, describing the planned project. The SENA responded on April 6, 2017 indicating that the applicant would be included on the May 18, 2017 meeting agenda. The applicant's consultant attended the SENA meeting, presented the project, and answered questions from the neighbors in attendance.

In order to show compliance with the applicable criteria, as required by 17.50.055.A.5, the required neighborhood meeting submittal items have been included in the application materials. This standard has been met.

IV. Conclusion

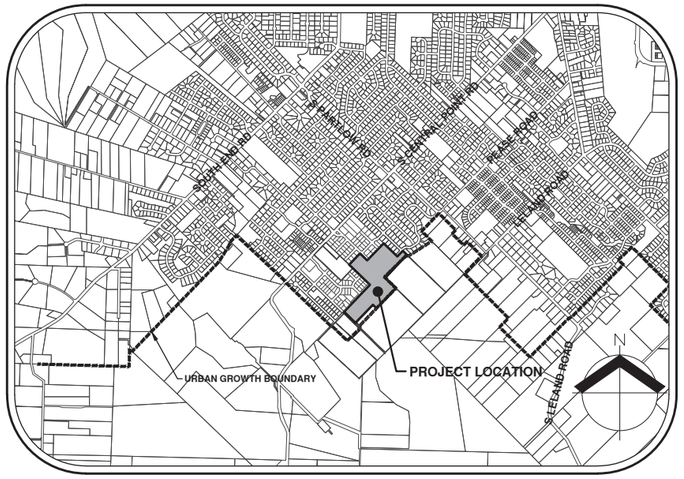
The planned subdivision will provide for detached single-family homes, which is expressly defined in ORS 197.303 as "needed housing" on buildable land. Therefore, the application is subject to ORS 197.307(4) (needed housing). The applicant reserves the right to object to the application of subjective criteria, standards, or conditions, and does not waive its right to assert that the needed housing statutes apply.

Pursuant to Municipal Code Section 16.08.010.B, this subdivision application in the R-8 zoning district is subject to review by the City through a Type II procedure. This narrative is supported by substantial evidence presented in the application materials, including preliminary plans and other written documentation. Considered together and with respect to the discussion provided above, this information provides the necessary basis for the City of Oregon City to approve the application.

Exhibit A: Preliminary Plans

WHEELER FARMS

PRELIMINARY SUBDIVISION PLANS



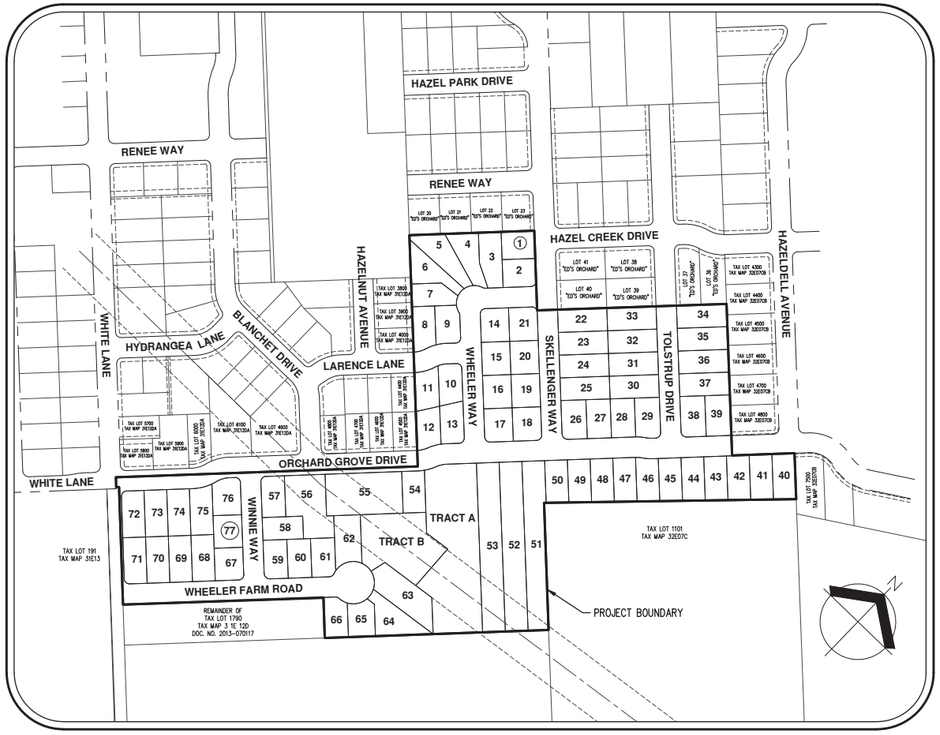
VICINITY MAP

NOT TO SCALE

LEGEND

	EXISTING	PROPOSED		EXISTING	PROPOSED
DECIDUOUS TREE			STORM SEWER CLEAN OUT		
CONIFEROUS TREE			STORM SEWER CATCH BASIN		
			STORM SEWER AREA DRAIN		
FIRE HYDRANT			STORM SEWER MANHOLE		
WATER BLOWOFF			GAS METER		
WATER METER			GAS VALVE		
WATER VALVE			GUY WIRE ANCHOR		
DOUBLE CHECK VALVE			POWER POLE		
AIR RELEASE VALVE			POWER VAULT	P	P
SANITARY SEWER CLEAN OUT			POWER JUNCTION BOX		
SANITARY SEWER MANHOLE			POWER PEDESTAL		
SIGN			COMMUNICATIONS VAULT	C	C
STREET LIGHT			COMMUNICATIONS JUNCTION BOX		
MAILBOX	MB	MB	COMMUNICATIONS RISER		

	EXISTING	PROPOSED
RIGHT-OF-WAY LINE		
BOUNDARY LINE		
PROPERTY LINE		
CENTERLINE		
DITCH		
CURB		
EDGE OF PAVEMENT		
EASEMENT		
FENCE LINE		
GRAVEL EDGE		
POWER LINE	PWR	PWR
OVERHEAD WIRE	OHW	OHW
COMMUNICATIONS LINE	COM	COM
FIBER OPTIC LINE	CFO	CFO
GAS LINE	GAS	GAS
STORM SEWER LINE	STM	STM
SANITARY SEWER LINE	SAN	SAN
WATER LINE	WAT	WAT



SITE MAP

SCALE: 1"=200'

APPLICANT:
RIAN PARK DEVELOPMENT, INC.
15239 S LAKE RIDE WAY
OREGON CITY, OREGON 97045

PLANNING/ENGINEERING/ SURVEYING FIRM:
AKS ENGINEERING & FORESTRY, LLC
CONTACT: MONTY HURLEY
12965 SW HERMAN ROAD, SUITE 100
TUALATIN, OR 97062
PH: 503-563-6151
FAX: 503-563-6152

PROJECT LOCATION:
19566 S CENTRAL POINT ROAD
OREGON CITY, OREGON 97045

PROPERTY DESCRIPTION:
TAX LOTS 1001, 1100, 1180, AND 1291 CLACKAMAS COUNTY ASSESSOR'S MAP NUMBER 3-2E-07C.
TAX LOTS 1700 AND 1790 CLACKAMAS COUNTY ASSESSOR'S MAP NUMBER 3-1E-12D WILLAMETTE MERIDIAN, CITY OF OREGON CITY, CLACKAMAS COUNTY, OREGON.

EXISTING LAND USE:
EXISTING HOME AND OUTBUILDINGS/ CHRISTMAS TREE AND HAZELNUT TREE FARM

PROJECT PURPOSE:
RESIDENTIAL SUBDIVISION ZONED FOR FUTURE SINGLE-FAMILY DETACHED RESIDENTIAL HOMES.

VERTICAL DATUM:
ELEVATIONS ARE BASED ON A 3" BRASS DISK MONUMENT SCRIBED 'GPS STA CENTRAL 1990' LOCATED IN A SURVEY MONUMENT BOX IN CENTRAL POINT ROAD NEAR THE INTERSECTION OF CENTRAL POINT ROAD AND HAZELDELL AVENUE, CITY OF OREGON CITY, CLACKAMAS COUNTY, OREGON ELEVATION = 455.10 FT

SHEET INDEX

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P1-03	PRELIMINARY EXISTING CONDITIONS PLAN
P1-04	PRELIMINARY SUBDIVISION PLAT WITH BUILDING SETBACKS
P1-05	PRELIMINARY SUBDIVISION PLAT WITH BUILDING SETBACKS
P1-06	PRELIMINARY GRADING & EROSION AND SEDIMENT CONTROL PLAN
P1-07	PRELIMINARY GRADING & EROSION AND SEDIMENT CONTROL PLAN
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P1-09	PRELIMINARY COMPOSITE UTILITY PLAN
P1-10	PRELIMINARY STREET PLAN
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P1-17	PRELIMINARY TREE PRESERVATION & REMOVAL PLAN
P1-18	PRELIMINARY TREE PRESERVATION & REMOVAL PLAN
P1-19	PRELIMINARY TREE PRESERVATION AND REMOVAL TABLE
P1-20	PRELIMINARY DEMOLITION PLAN
P1-21	PRELIMINARY DEMOLITION PLAN
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P1-23	PRELIMINARY STREET TREE AND TREE MITIGATION PLAN
P1-24	PRELIMINARY EMERGENCY ACCESS PLAN
P1-25	PRELIMINARY EMERGENCY ACCESS PLAN

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AKS ENGINEERING - SURVEYING - NATURAL RESOURCES
FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE

WHEELER FARMS
OREGON
CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

OREGON CITY
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

COVER SHEET WITH SITE & VICINITY MAPS & LEGEND

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED

DATE: 06/20/2017

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 12, 2005
MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
MAY 9, 2017

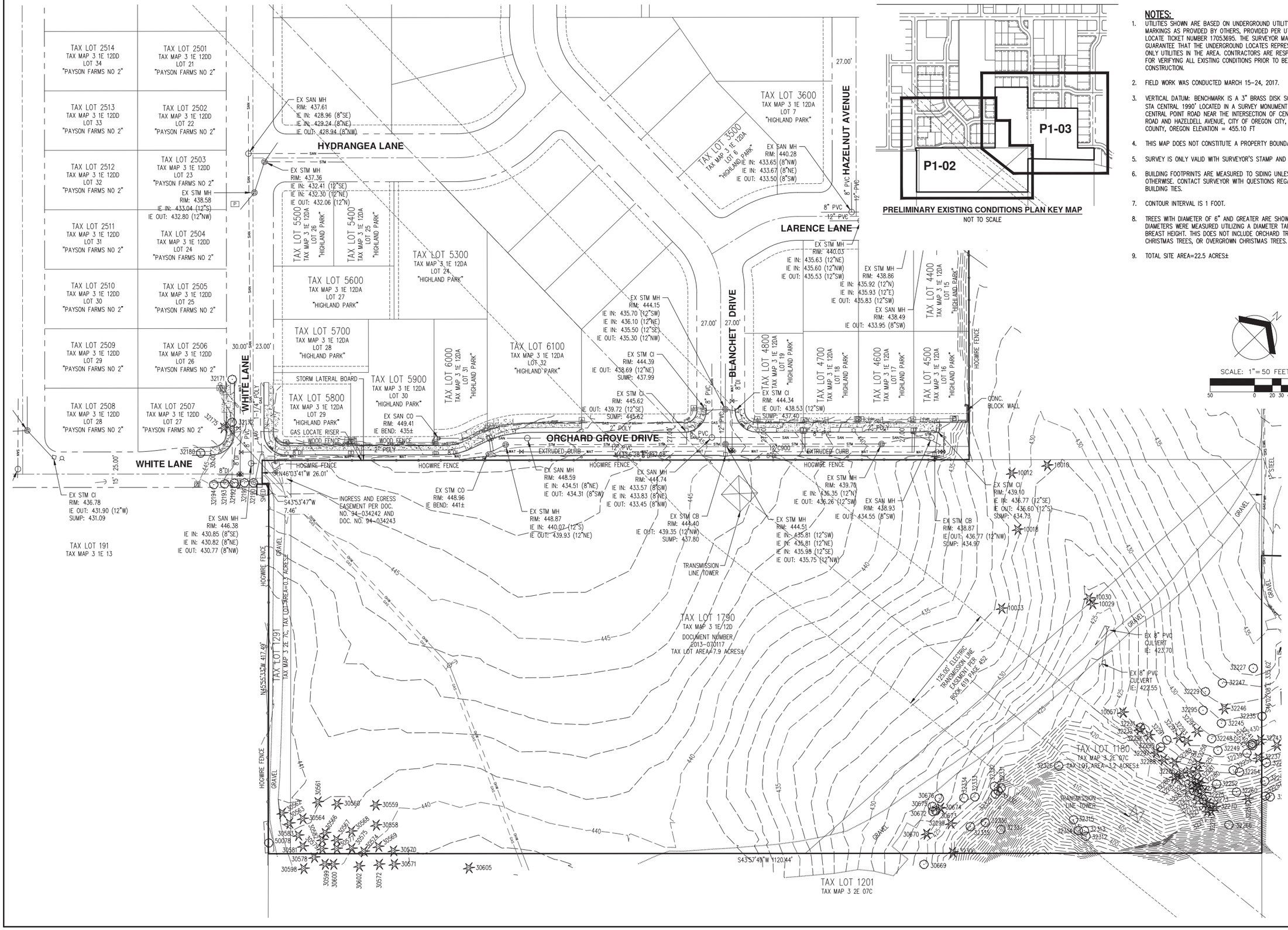
RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER
5621

SHEET
P1-01

AKS DRAWING FILE: 5621 COVER.DWG | LAYOUT: P1-01



NOTES:

1. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS AS PROVIDED BY OTHERS, PROVIDED PER UTILITY LOCATE TICKET NUMBER 17053695. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
2. FIELD WORK WAS CONDUCTED MARCH 15–24, 2017.
3. VERTICAL DATUM: BENCHMARK IS A 3" BRASS DISK SCRIBED 'GPS STA CENTRAL 1990' LOCATED IN A SURVEY MONUMENT BOX IN CENTRAL POINT ROAD NEAR THE INTERSECTION OF CENTRAL POINT ROAD AND HAZELDELL AVENUE, CITY OF OREGON CITY, CLACKAMAS COUNTY, OREGON ELEVATION = 455.10 FT
4. THIS MAP DOES NOT CONSTITUTE A PROPERTY BOUNDARY SURVEY.
5. SURVEY IS ONLY VALID WITH SURVEYOR'S STAMP AND SIGNATURE.
6. BUILDING FOOTPRINTS ARE MEASURED TO SIDING UNLESS NOTED OTHERWISE. CONTACT SURVEYOR WITH QUESTIONS REGARDING BUILDING TIES.
7. CONTOUR INTERVAL IS 1 FOOT.
8. TREES WITH DIAMETER OF 6" AND GREATER ARE SHOWN. TREE DIAMETERS WERE MEASURED UTILIZING A DIAMETER TAPE AT BREAST HEIGHT. THIS DOES NOT INCLUDE ORCHARD TREES, CHRISTMAS TREES, OR OVERGROWN CHRISTMAS TREES.
9. TOTAL SITE AREA=22.5 ACRES±

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WHEELER FARMS
OREGON CITY
OREGON
CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

PRELIMINARY EXISTING CONDITIONS PLAN

DESIGNED BY:
DRAWN BY: JOH
CHECKED BY: RDR
SCALE: AS NOTED
DATE: 06/20/2017

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JANUARY 11, 2005
ROBERT D. RETTIG
60124LS
RENEWS: 12/31/18

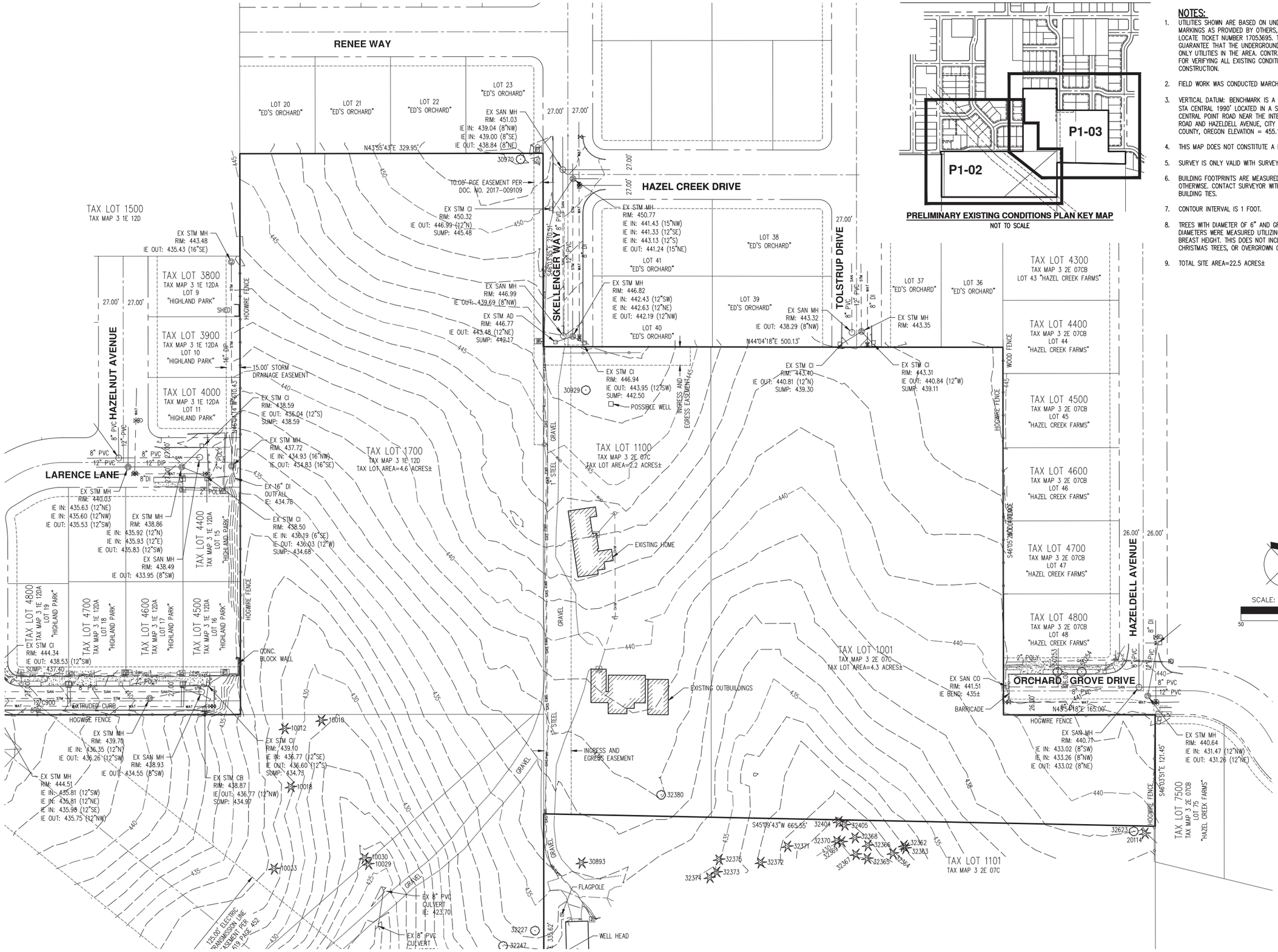
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER
5621

SHEET
P1-02

AKS DRAWING FILE: 5621 EXCOND [PRELIM].DWG | LAYOUT: P1-02



PRELIMINARY EXISTING CONDITIONS PLAN KEY MAP
NOT TO SCALE

NOTES:

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WHEELER FARMS
OREGON CITY
OREGON
CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

PRELIMINARY EXISTING CONDITIONS PLAN

DESIGNED BY:
DRAWN BY: JOH
CHECKED BY: RDR
SCALE: AS NOTED
DATE: 06/20/2017

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JANUARY 11, 2005
ROBERT D. RETTIG
60124LS
RENEWS: 12/31/18

PRELIMINARY NOT FOR CONSTRUCTION

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JOB NUMBER
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SHEET
P1-03

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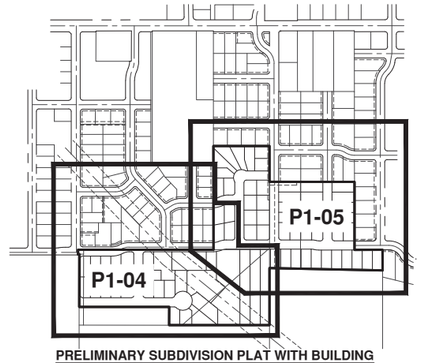

PRELIMINARY SUBDIVISION PLAT WITH BUILDING SETBACKS PLAN KEY MAP
NOT TO SCALE

SETBACK LEGEND:

- (Y) 15' MINIMUM FRONT YARD SETBACK
- (G) 20' MINIMUM GARAGE SETBACK
- (S1) *7' MINIMUM INTERIOR SIDE YARD SETBACK
- (S2) *9' MINIMUM INTERIOR SIDE YARD SETBACK
- (C) 15' MINIMUM CORNER SIDE YARD SETBACK
- (R) 20' MINIMUM REAR YARD SETBACK

*7' AND 9' INTERIOR SIDE YARD SETBACKS CAN BE SWAPPED (TYPICAL). ONE SIDE YARD HAS TO BE A MINIMUM OF 7', THE OTHER SIDE YARD SETBACK HAS TO BE A MINIMUM OF 9'.

PRELIMINARY SUBDIVISION PLAT NOTE:

THE PURPOSE OF THIS PRELIMINARY PLAT IS TO SHOW THE LOT DIMENSIONS FOR PLANNING PURPOSES. THIS IS NOT A FINAL PLAT AND IS NOT TO BE USED FOR SURVEYING PURPOSES.

ZONE R-8:

NET AREA: 626,486 SQUARE FEET±
AVERAGE LOT AREA: 8,279 SQUARE FEET±

SCALE: 1"= 50 FEET

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WHEELER FARMS

OREGON

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

OREGON CITY

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

PRELIMINARY SUBDIVISION PLAT WITH BUILDING SETBACKS

DESIGNED BY: VHN/NMC
DRAWN BY: NMC
CHECKED BY: MBH
SCALE: AS NOTED
DATE: 06/20/2017

REGISTERED PROFESSIONAL ENGINEER — OREGON — JULY 09, 2002 — MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER
5621

SHEET
P1-04

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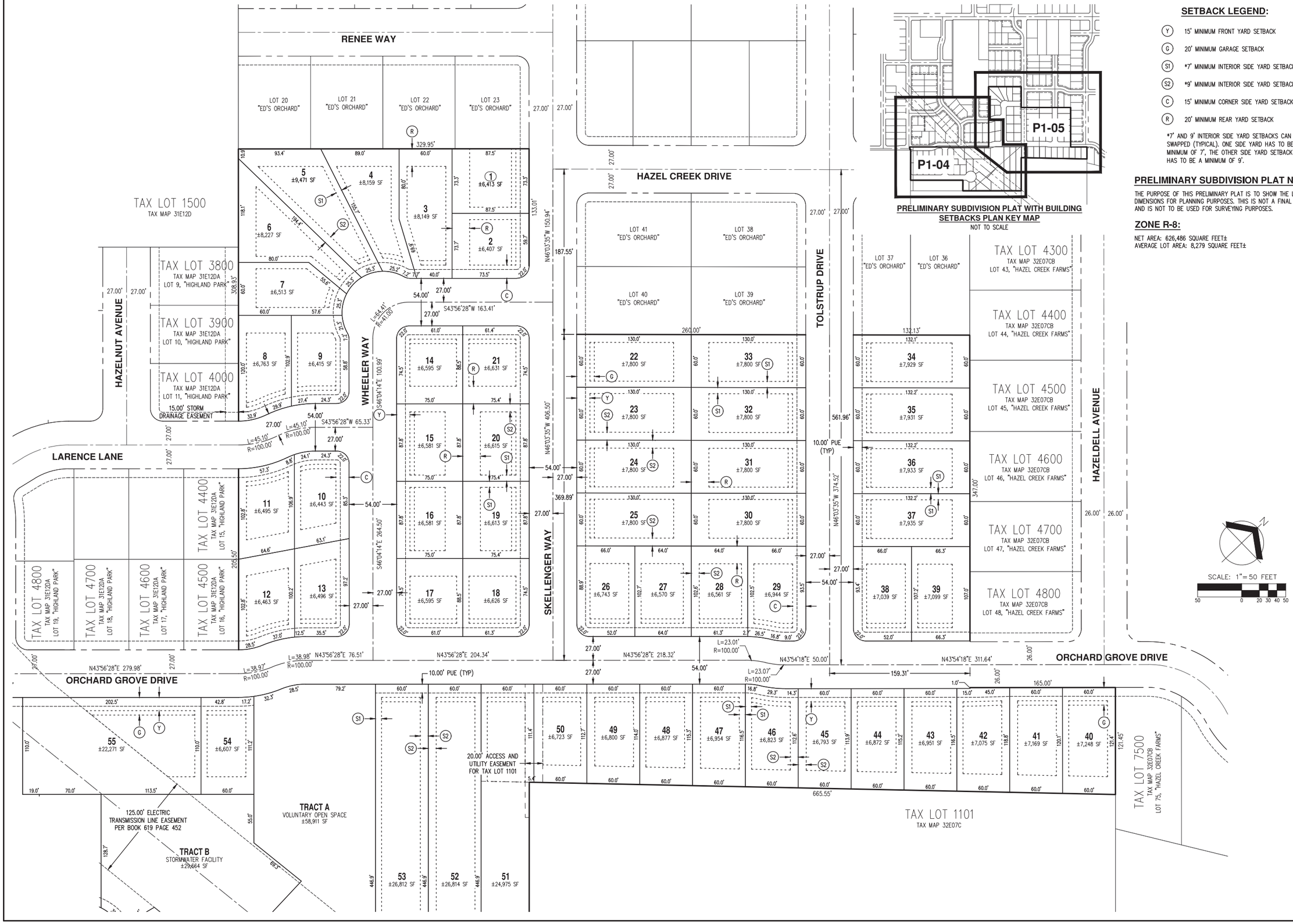

PRELIMINARY SUBDIVISION PLAT WITH BUILDING SETBACKS PLAN KEY MAP
NOT TO SCALE

SCALE: 1"= 50 FEET

SETBACK LEGEND:

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OREGON

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

OREGON CITY

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

PRELIMINARY SUBDIVISION PLAT WITH BUILDING SETBACKS

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JANUARY 9, 2002
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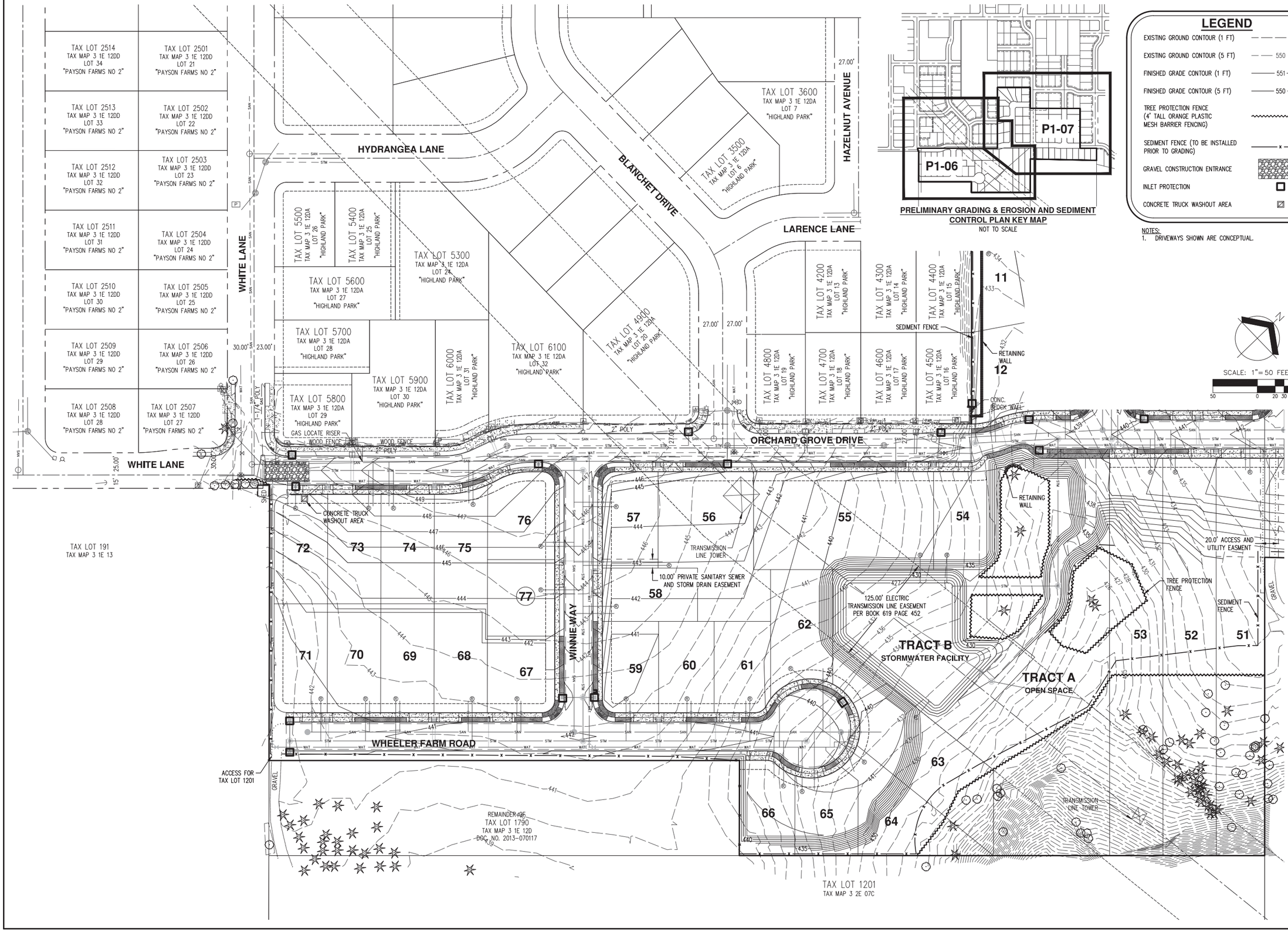

PRELIMINARY GRADING & EROSION AND SEDIMENT CONTROL PLAN KEY MAP
NOT TO SCALE

LEGEND

- EXISTING GROUND CONTOUR (1 FT)
- EXISTING GROUND CONTOUR (5 FT) — 550 —
- FINISHED GRADE CONTOUR (1 FT) — 551 —
- FINISHED GRADE CONTOUR (5 FT) — 550 —
- TREE PROTECTION FENCE (4' TALL ORANGE PLASTIC MESH BARRIER FENCING)
- SEDIMENT FENCE (TO BE INSTALLED PRIOR TO GRADING) — x —
- GRAVEL CONSTRUCTION ENTRANCE
- INLET PROTECTION
- CONCRETE TRUCK WASHOUT AREA

NOTES:
1. DRIVEWAYS SHOWN ARE CONCEPTUAL.

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WHEELER FARMS

OREGON

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

OREGON CITY

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

PRELIMINARY GRADING & EROSION AND SEDIMENT CONTROL PLAN

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE: 06/20/2017	

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 9, 2002
MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/19

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SHEET
P1-06

AKS DRAWING FILE: 5621 ESC.DWG | LAYOUT: P1-06

RENEE WAY

HAZEL CREEK DRIVE

TOLSTRUP DRIVE

HAZELNUT AVENUE

LARENCE LANE

WHEELER WAY

SKELLENGER WAY

ORCHARD GROVE DRIVE

HAZELDELL AVENUE

TAX LOT 1500
TAX MAP 3 1E 12D

LOT 20 "ED'S ORCHARD"
LOT 21 "ED'S ORCHARD"
LOT 22 "ED'S ORCHARD"
LOT 23 "ED'S ORCHARD"
LOT 41 "ED'S ORCHARD"
LOT 38 "ED'S ORCHARD"
LOT 40 "ED'S ORCHARD"
LOT 39 "ED'S ORCHARD"
LOT 37 "ED'S ORCHARD"
LOT 36 "ED'S ORCHARD"

TAX LOT 3800
TAX MAP 3 1E 12DA
LOT 9
"HIGHLAND PARK"

TAX LOT 3900
TAX MAP 3 1E 12DA
LOT 10
"HIGHLAND PARK"

TAX LOT 4000
TAX MAP 3 1E 12DA
LOT 11
"HIGHLAND PARK"

TAX LOT 4200
TAX MAP 3 1E 12DA
LOT 13
"HIGHLAND PARK"

TAX LOT 4300
TAX MAP 3 1E 12DA
LOT 14
"HIGHLAND PARK"

TAX LOT 4400
TAX MAP 3 1E 12DA
LOT 15
"HIGHLAND PARK"

TAX LOT 4800
TAX MAP 3 1E 12DA
LOT 19
"HIGHLAND PARK"

TAX LOT 4700
TAX MAP 3 1E 12DA
LOT 18
"HIGHLAND PARK"

TAX LOT 4600
TAX MAP 3 1E 12DA
LOT 17
"HIGHLAND PARK"

TAX LOT 4500
TAX MAP 3 1E 12DA
LOT 16
"HIGHLAND PARK"

TAX LOT 4300
TAX MAP 3 2E 07CB
LOT 43 "HAZEL CREEK FARMS"

TAX LOT 4400
TAX MAP 3 2E 07CB
LOT 44
"HAZEL CREEK FARMS"

TAX LOT 4500
TAX MAP 3 2E 07CB
LOT 45
"HAZEL CREEK FARMS"

TAX LOT 4600
TAX MAP 3 2E 07CB
LOT 46
"HAZEL CREEK FARMS"

TAX LOT 4700
TAX MAP 3 2E 07CB
LOT 47
"HAZEL CREEK FARMS"

TAX LOT 4800
TAX MAP 3 2E 07CB
LOT 48
"HAZEL CREEK FARMS"

TAX LOT 7500
TAX MAP 3 2E 07CB
LOT 75
"HAZEL CREEK FARMS"

TAX LOT 1101
TAX MAP 3 2E 07C

15.00' STORM DRAINAGE EASEMENT

SHED

SEDIMENT FENCE

RETAINING WALL

CONC. BLOCK WALL

20.0' ACCESS AND UTILITY EASEMENT

TREE PROTECTION FENCE

SEDIMENT FENCE

GRAVEL

FLAGPOLE

WELL HEAD

125.00' ELECTRIC TRANSMISSION LINE EASEMENT PER BOOK 619 PAGE 452

TRACT B
STORMWATER FACILITY

TRACT A

WOOD FENCE

27.00' 27.00'

26.00' 26.00'

8" DI

2" POLY

GAS

SAN

STM

WAT

OHP

PRELIMINARY GRADING & EROSION AND SEDIMENT CONTROL PLAN KEY MAP

NOT TO SCALE

P1-06

P1-07

LEGEND

- EXISTING GROUND CONTOUR (1 FT)
- EXISTING GROUND CONTOUR (5 FT) — 550
- FINISHED GRADE CONTOUR (1 FT) — 551
- FINISHED GRADE CONTOUR (5 FT) — 550
- TREE PROTECTION FENCE (4' TALL ORANGE PLASTIC MESH BARRIER FENCING)
- SEDIMENT FENCE (TO BE INSTALLED PRIOR TO GRADING) — x
- GRAVEL CONSTRUCTION ENTRANCE
- INLET PROTECTION
- CONCRETE TRUCK WASHOUT AREA

NOTES:
1. DRIVEWAYS SHOWN ARE CONCEPTUAL.

SCALE: 1" = 50 FEET
50 0 20 30 40 50

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WHEELER FARMS

OREGON

OREGON CITY
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

PRELIMINARY GRADING & EROSION AND SEDIMENT CONTROL PLAN

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE:	06/20/2017

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 9, 2002
MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION

RENEWAL DATE: 6/30/19

REVISIONS

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SHEET
P1-07

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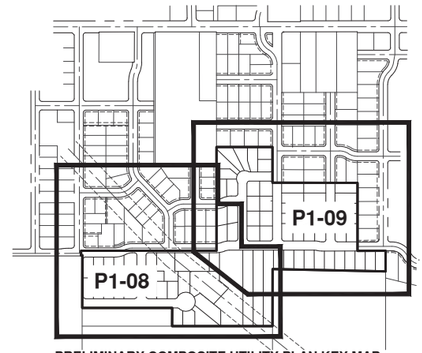

PRELIMINARY COMPOSITE UTILITY PLAN KEY MAP
NOT TO SCALE

SCALE: 1"= 50 FEET
50 0 20 30 40 50

EX SAN MH
RIM: 437.61
IE IN: 428.96(8"SE)
IE IN: 429.24(8"NE)
IE OUT: 428.94(8"NW)

EX STM MH
RIM: 438.58
IE INI 433.04(12"S)
IE OUT: 432.80(12"NW)

EX STM MH
RIM: 437.36
IE IN: 432.41(12"SE)
IE IN: 432.30(12"NE)
IE OUT: 432.06(12"N)

EX SAN MH
RIM: 440.28
IE IN: 433.65(8"NW)
IE IN: 433.67(8"NE)
IE OUT: 433.50(8"SW)

HAZELNUT AVENUE

BLANCHET DRIVE

LARENCE LANE

WHITE LANE

EX STM CB
RIM: 440.03
IE IN: 435.63(12"NE)
IE IN: 435.60(12"NW)
IE OUT: 435.53(12"SW)

RIM: 438.86
IE IN: 435.92(12"N)
IE IN: 435.93(12"E)
IE OUT: 435.83(12"SW)

EX STM MH
RIM: 444.15
IE IN: 435.70(12"SW)
IE IN: 436.10(12"NE)
IE IN: 435.50(12"SE)
IE OUT: 435.30(12"NW)

EX STM CI
RIM: 444.34
IE OUT: 438.53(12"SW)

EX STM CI
RIM: 438.50
IE IN: 436.19(6"SE)
IE OUT: 436.03(12"W)

TAX LOT 5700
TAX MAP 31E12DA
LOT 28, "HIGHLAND PARK"

TAX LOT 5800
TAX MAP 31E12DA
LOT 29, "HIGHLAND PARK"

TAX LOT 5900
TAX MAP 31E12DA
LOT 30, "HIGHLAND PARK"

TAX LOT 6000
TAX MAP 31E12DA
LOT 31, "HIGHLAND PARK"

TAX LOT 6100
TAX MAP 31E12DA
LOT 32, "HIGHLAND PARK"

TAX LOT 4900
TAX MAP 31E12DA
LOT 20, "HIGHLAND PARK"

TAX LOT 4800
TAX MAP 31E12DA
LOT 19, "HIGHLAND PARK"

TAX LOT 4700
TAX MAP 31E12DA
LOT 18, "HIGHLAND PARK"

TAX LOT 4600
TAX MAP 31E12DA
LOT 17, "HIGHLAND PARK"

TAX LOT 4500
TAX MAP 31E12DA
LOT 16, "HIGHLAND PARK"

TAX LOT 4400
TAX MAP 31E12DA
LOT 15, "HIGHLAND PARK"

11

12

EX STM MH
RIM: 436.74
IE IN: 427.74(24"SW)
IE IN: 428.26(12"E)
IE OUT: 426.95(24"NW)
WEIR INSTALLED

EX STM CI
RIM: 436.78
IE OUT: 431.90(12"W)
SUMP: 431.09

EX SAN MH
RIM: 446.38
IE IN: 430.85(8"SE)
IE IN: 430.82(8"NE)
IE OUT: 430.77(8"NW)

EX STM CO
RIM: 448.96
IE BEND: 441±

EX STM CI
RIM: 444.39
IE OUT: 438.69(12"NE)

EX STM CI
RIM: 445.62
IE OUT: 439.72(12"SE)

EX STM MH
RIM: 448.87
IE IN: 440.07(12"S)
IE OUT: 439.93(12"NE)

GAS LOCATE RISER

2" POLY

SAN MH
RIM: 447.76
IE IN: 432.57(8"SE)
IE OUT: 432.27(8"SW)

ORCHARD GROVE DRIVE

CONC. ROCK WALL

WHITE LANE

EX SAN MH
RIM: 436.80
IE IN: 429.94(8"SE)
IE OUT: 429.77(8"NW)

EX SAN MH
RIM: 448.59
IE IN: 434.51(8"NE)
IE OUT: 434.31(8"SW)

EX SAN MH
RIM: 444.74
IE IN: 433.53(8"SW)
IE IN: 433.83(8"NE)
IE OUT: 433.45(8"NW)

EX STM MH
RIM: 439.70
IE IN: 436.35(12"N)
IE OUT: 436.26(12"SW)

EX STM MH
RIM: 444.51
IE IN: 435.81(12"SW)
IE IN: 435.81(12"NE)
IE IN: 435.98(12"SE)
IE OUT: 435.75(12"NW)

EX SAN MH
RIM: 438.93
IE IN: 434.65(8"NE)
IE OUT: 434.55(8"SW)

EX STM CB
RIM: 439.10
IE IN: 436.77(12"SE)
IE OUT: 436.60(12"S)

SAN MH
RIM: 439.67
IE IN: 435.61(8"NW)
IE IN: 435.51(8"NE)
IE OUT: 435.41(8"SW)

VEGETATED SWALE (TYP)

SAN MH
RIM: 442.59
IE IN: 436.53(8"NW)
IE OUT: 436.33(8"SW)
IE: 437.14(8"NE)

20.00' ACCESS AND UTILITY EASEMENT

72 73 74 75 76 77

57 56 55 54

10' PUE (TYP)

TRANSMISSION LINE TOWER

10.00' PRIVATE SANITARY SEWER AND STORM DRAIN EASEMENT

58

STORM DRAIN LATERAL (TYP)

125.00' ELECTRIC TRANSMISSION LINE EASEMENT PER BOOK 619 PAGE 452

TRACT A
OPEN SPACE

TRACT B
STORMWATER FACILITY

62

WINNIE WAY

VEGETATED SWALE (TYP)

TAX LOT 191
TAX MAP 31E13

71 70 69 68 67 59 60 61 53 52 51

CURB INLET (TYP)

FIRE HYDRANT (TYP)

SANITARY SEWER LATERAL CLEANOUT (TYP)

WATER SERVICE (TYP)

SANITARY SEWER MANHOLE (TYP)

SAN MH
RIM: 439.93
IE OUT: 435.20(8"SW)

WHEELER FARM ROAD

SAN MH
RIM: 440.43
IE OUT: 435.20(8"NE)

SAN MH
RIM: 441.95
IE IN: 434.00(8"SW)
IE IN: 434.00(8:NE)
IE OUT: 433.80(8"NW)

STORM DRAIN MANHOLE (TYP)

63

GRAVEL

REMAINDER OF
TAX LOT 1790
TAX MAP 3 1E 12D
DOC. NO. 2013-070117

STORM DRAIN LATERAL (TYP)

66 65 64

SANITARY SEWER LATERAL (TYP)

TRANSMISSION LINE TOWER

GRAVEL

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CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

OREGON CITY

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

PRELIMINARY COMPOSITE UTILITY PLAN

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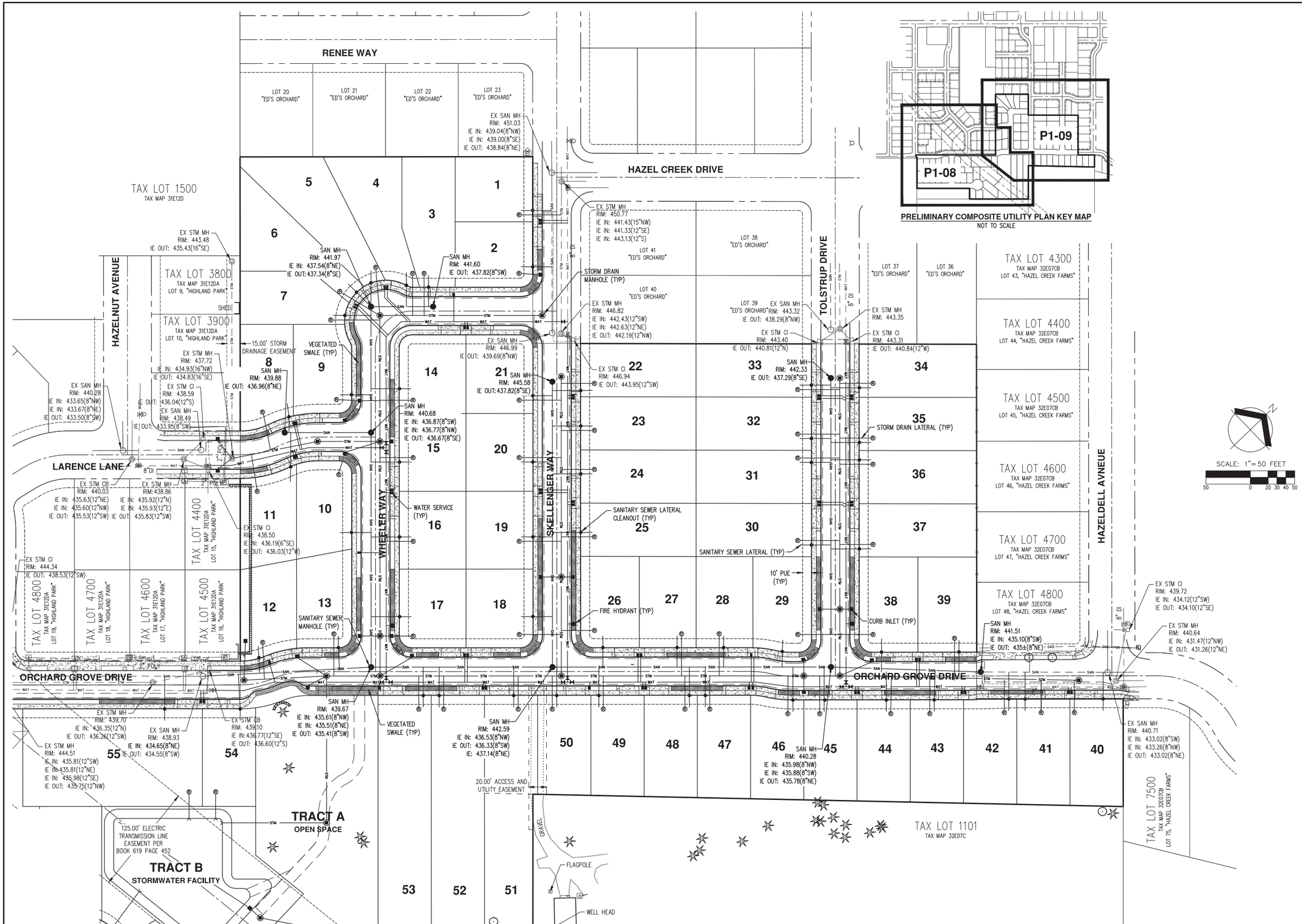
MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION

RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER
5621

SHEET
P1-08



PRELIMINARY COMPOSITE UTILITY PLAN KEY MAP
NOT TO SCALE

SCALE: 1" = 50 FEET
50 0 20 30 40 50

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TUALATIN, OR 97062
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WHEELER FARMS

OREGON

OREGON CITY
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

PRELIMINARY COMPOSITE UTILITY PLAN

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE:	06/20/2017

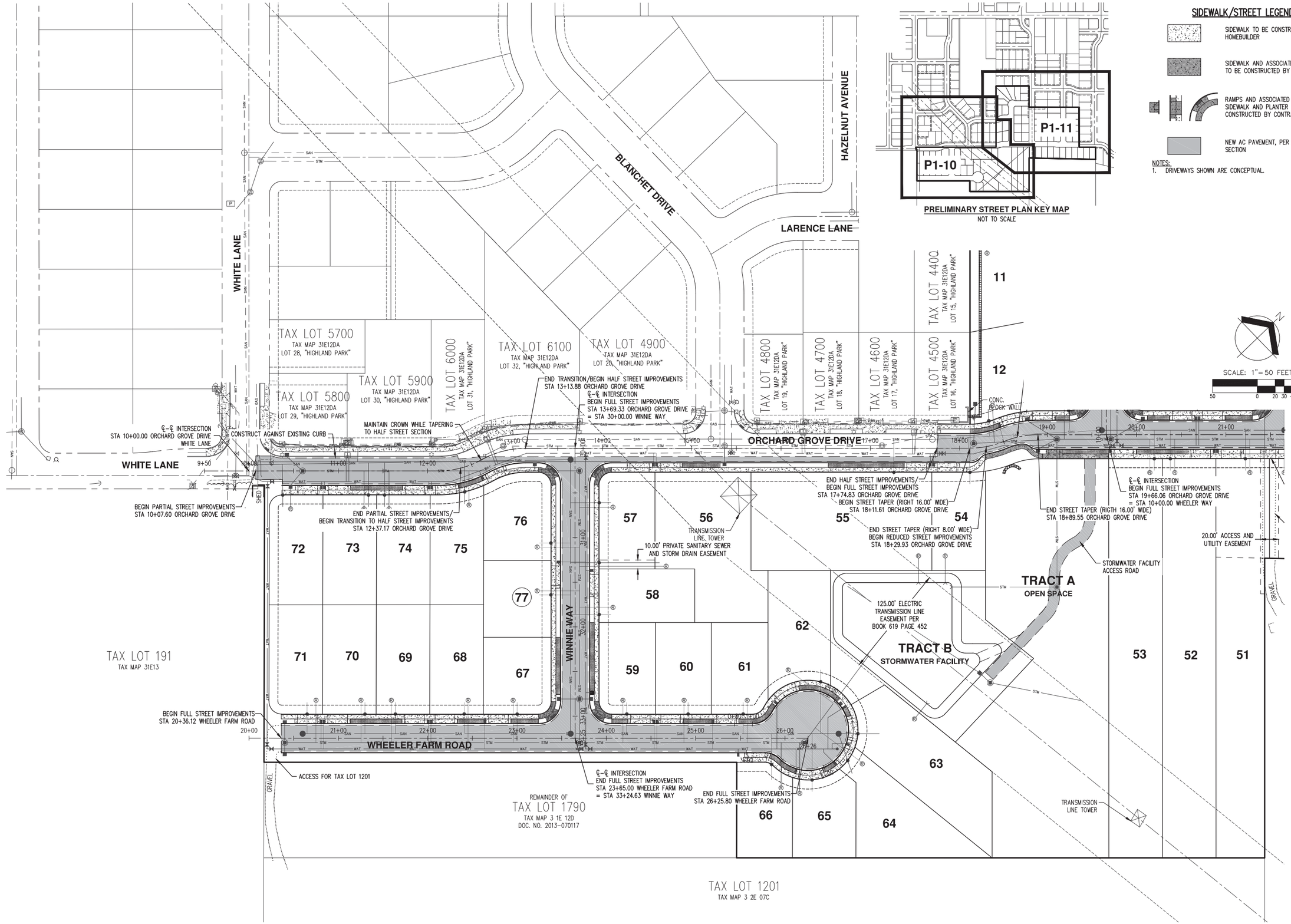
REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 13, 2009
MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
MAY 9, 2017
RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER
5621

SHEET
P1-09

AKS DRAWING FILE: 5621 UTILITIES.DWG | LAYOUT: P1-09



PRELIMINARY STREET PLAN KEY MAP
NOT TO SCALE

SIDEWALK/STREET LEGEND

- SIDEWALK TO BE CONSTRUCTED BY HOMEBUILDER
- SIDEWALK AND ASSOCIATED PLANTER TO BE CONSTRUCTED BY CONTRACTOR
- RAMPS AND ASSOCIATED SIDEWALK AND PLANTER TO BE CONSTRUCTED BY CONTRACTOR
- NEW AC PAVEMENT, PER TYPICAL SECTION

NOTES:
1. DRIVEWAYS SHOWN ARE CONCEPTUAL.

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WHEELER FARMS

OREGON

OREGON CITY

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

PRELIMINARY STREET PLAN

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE:	06/20/2017

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 12, 2005
MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
EXPIRES: MAY 9, 2018
RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER
5621

SHEET
P1-10

AKS DRAWING FILE: 5621 STREETS.DWG | LAYOUT: P1-10

RENEE WAY

HAZEL CREEK DRIVE

TOLSTRUP DRIVE

HAZELNUT AVENUE

LARENCE LANE

WHEELER WAY

SKELLENGER WAY

HAZELDELL AVENUE

ORCHARD GROVE DRIVE

TAX LOT 1500
TAX MAP 31E12D

TAX LOT 3800
TAX MAP 31E12DA
LOT 9, "HIGHLAND PARK"

TAX LOT 3900
TAX MAP 31E12DA
LOT 10, "HIGHLAND PARK"

TAX LOT 4000
TAX MAP 31E12DA
LOT 11, "HIGHLAND PARK"

TAX LOT 4400
TAX MAP 31E12DA
LOT 15, "HIGHLAND PARK"

TAX LOT 4500
TAX MAP 31E12DA
LOT 16, "HIGHLAND PARK"

TAX LOT 4600
TAX MAP 31E12DA
LOT 17, "HIGHLAND PARK"

TAX LOT 4700
TAX MAP 31E12DA
LOT 18, "HIGHLAND PARK"

TAX LOT 4800
TAX MAP 31E12DA
LOT 19, "HIGHLAND PARK"

LOT 20 "ED'S ORCHARD"
LOT 21 "ED'S ORCHARD"
LOT 22 "ED'S ORCHARD"
LOT 23 "ED'S ORCHARD"
LOT 41 "ED'S ORCHARD"
LOT 38 "ED'S ORCHARD"
LOT 40 "ED'S ORCHARD"
LOT 39 "ED'S ORCHARD"
LOT 37 "ED'S ORCHARD"
LOT 36 "ED'S ORCHARD"

TAX LOT 4300
TAX MAP 32E07CB
LOT 43, "HAZEL CREEK FARMS"

TAX LOT 4400
TAX MAP 32E07CB
LOT 44, "HAZEL CREEK FARMS"

TAX LOT 4500
TAX MAP 32E07CB
LOT 45, "HAZEL CREEK FARMS"

TAX LOT 4600
TAX MAP 32E07CB
LOT 46, "HAZEL CREEK FARMS"

TAX LOT 4700
TAX MAP 32E07CB
LOT 47, "HAZEL CREEK FARMS"

TAX LOT 4800
TAX MAP 32E07CB
LOT 48, "HAZEL CREEK FARMS"

TAX LOT 7500
TAX MAP 32E07CB
LOT 75, "HAZEL CREEK FARMS"

TAX LOT 1101
TAX MAP 32E07C

15.00' STORM DRAINAGE EASEMENT

SHED

BEGIN HALF STREET IMPROVEMENTS
STA 28+05.15 SKELLENGER WAY

℄–℄ INTERSECTION
END FULL STREET IMPROVEMENTS
STA 29+17.11 SKELLENGER WAY
= STA 15+93.31 WHEELER WAY

END HALF STREET IMPROVEMENTS/
BEGIN FULL STREET IMPROVEMENTS
STA 29+45.52 SKELLENGER WAY

BEGIN FULL STREET IMPROVEMENTS
STA 65+26.97 TOLSTRUP DRIVE

BEGIN FULL STREET IMPROVEMENTS
STA 12+61.90 LARENCE LANE

℄–℄ INTERSECTION
END FULL STREET IMPROVEMENTS
STA 12+64.50 WHEELER WAY
= STA 14+56.04 LARENCE LANE

BEGIN STREET TAPER (RIGHT 8.00' WIDE)
END REDUCED STREET IMPROVEMENTS
STA 18+66.14 ORCHARD GROVE DRIVE

CONC. ROCK WALL

℄–℄ INTERSECTION
END FULL STREET IMPROVEMENTS
STA 21+70.40 ORCHARD GROVE DRIVE
= STA 33+23.61 SKELLENGER WAY

MATCH EXISTING CURB AND SIDEWALK

END PAVEMENT TAPER (LEFT: 18.05' WIDE)/
END FULL STREET IMPROVEMENTS/
BEGIN HALF STREET IMPROVEMENTS
STA 26+52.82 ORCHARD GROVE DRIVE

BEGIN PAVEMENT TAPER (RIGHT:6.94' WIDE)
STA 27+84.91 ORCHARD GROVE DRIVE

END PAVEMENT TAPER (RIGHT 13.12' WIDE)/
END HALF STREET IMPROVEMENTS
STA 28+15.66 ORCHARD GROVE DRIVE

MATCH EXISTING CURB AND SIDEWALK

END HALF STREET IMPROVEMENTS/
BEGIN FULL STREET IMPROVEMENTS
STA 17+74.83 ORCHARD GROVE DRIVE

BEGIN STREET TAPER (RIGHT 16.00' WIDE)
STA 18+11.61 ORCHARD GROVE DRIVE

END STREET TAPER (RIGHT 8.00' WIDE)
BEGIN REDUCED STREET IMPROVEMENTS
STA 18+29.93 ORCHARD GROVE DRIVE

℄–℄ INTERSECTION
BEGIN FULL STREET IMPROVEMENTS
STA 19+66.06 ORCHARD GROVE DRIVE
= STA 10+00.00 WHEELER WAY

END STREET TAPER (RIGTH 16.00' WIDE)
STA 18+89.55 ORCHARD GROVE DRIVE

PRIVATE ACCESS DRIVEWAY

ACCESS FOR TAX LOT 1101

20.00' ACCESS AND UTILITY EASEMENT

℄–℄ INTERSECTION
END FULL STREET IMPROVEMENTS
STA 24+84.81 ORCHARD GROVE DRIVE
= STA 69+06.49 TOLSTRUP DRIVE

BEGIN PAVEMENT TAPER (LEFT: 16.00' WIDE)
STA 26+44.14 ORCHARD GROVE DRIVE

STORMWATER FACILITY ACCESS ROAD

TRACT A
OPEN SPACE

TRACT B
STORMWATER FACILITY

125.00' ELECTRIC TRANSMISSION LINE EASEMENT PER BOOK 619 PAGE 452

GRAVEL

FLAGPOLE

P1-10

P1-11

PRELIMINARY STREET PLAN KEY MAP
NOT TO SCALE

SIDEWALK/STREET LEGEND

- SIDEWALK TO BE CONSTRUCTED BY HOMEBUILDER
- SIDEWALK AND ASSOCIATED PLANTER TO BE CONSTRUCTED BY CONTRACTOR
- RAMPS AND ASSOCIATED SIDEWALK AND PLANTER TO BE CONSTRUCTED BY CONTRACTOR
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NOTES:
1. DRIVEWAYS SHOWN ARE CONCEPTUAL.

SCALE: 1" = 50 FEET
50 0 20 30 40 50

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WHEELER FARMS

OREGON

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TAX LOTS 1700 AND 1790

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

PRELIMINARY STREET PLAN

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE:	06/20/2017

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 09, 2002
MONTGOMERY B. HURLEY
RENEWAL DATE: 6/30/19

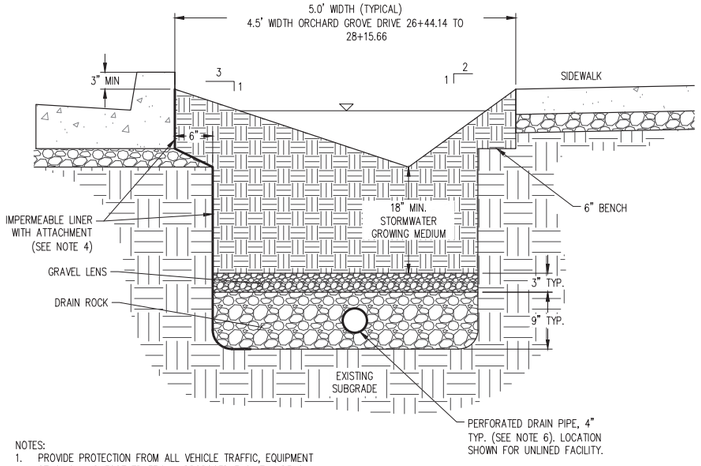
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER
5621

SHEET
P1-11

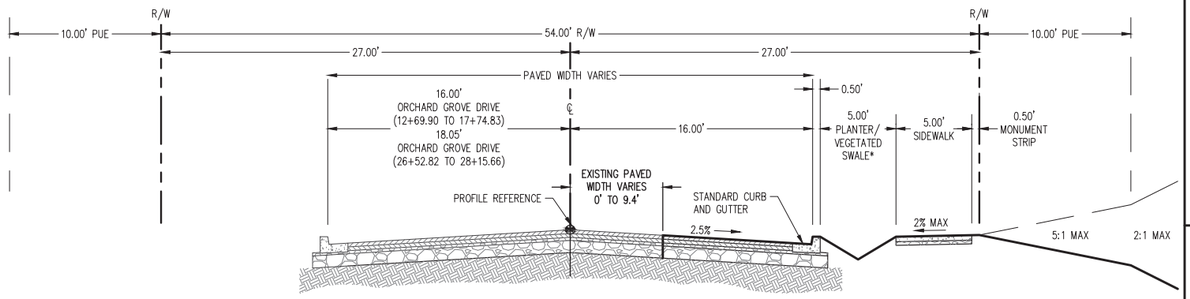
AKS DRAWING FILE: 5621 STREETS.DWG | LAYOUT: P1-11



NOTES:
1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED FACILITY AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION.
2. GROWING MEDIUM SHALL BE PLACED IN EVEN LIFTS NO GREATER THAN 8-INCHES IN DEPTH, AS MEASURED LOOSELY. LIFTS SHALL BE MODERATELY COMPACTED BY USE OF A SAND OR WATER FILLED LAWN ROLLER. MECHANICAL COMPACTION WITH JUMPING JACKS OR SIMILAR EQUIPMENT IS PROHIBITED.
3. GROWING MEDIUM IN EACH FACILITY SHALL BE PLACED AND SHAPED THE SAME DAY AND IMMEDIATELY UPON COMPLETION, ITS SURFACE SHALL BE PROTECTED WITH STRAW MATTING OR JUTE MATTING.
4. IMPERMEABLE LINER SHALL BE 30 MIL PVC OR EQUIVALENT.
5. VEGETATION: INSTALL PER PLANTING SCHEDULE.
6. BOTTOM OF PERFORATED DRAIN PIPE SHALL BE SET AT 2½" ABOVE EXISTING SUBGRADE.

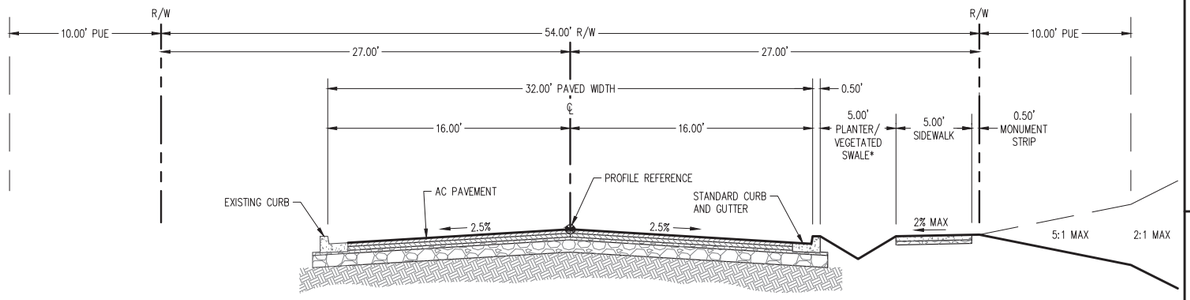
VEGETATED FILTRATION SWALE

NTS



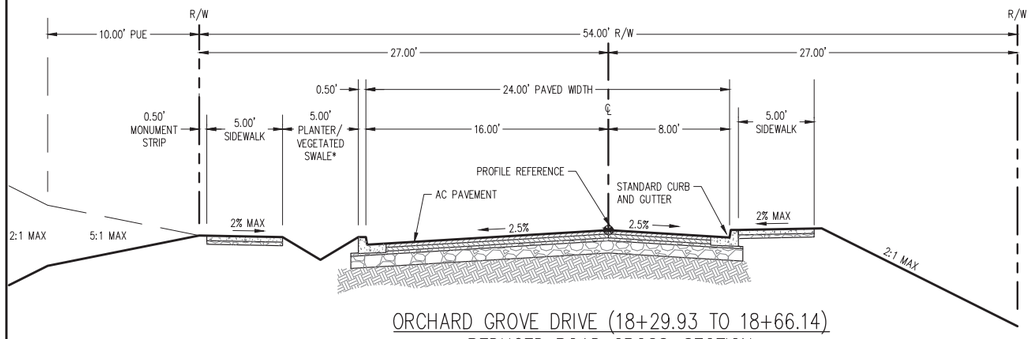
ORCHARD GROVE DRIVE (13+13.88 TO 17+74.83) AND
(26+52.82 TO 28+15.66)
SKELLENGER WAY (28+05.15 TO 29+45.52)
HALF STREET CROSS-SECTION

NOT TO SCALE



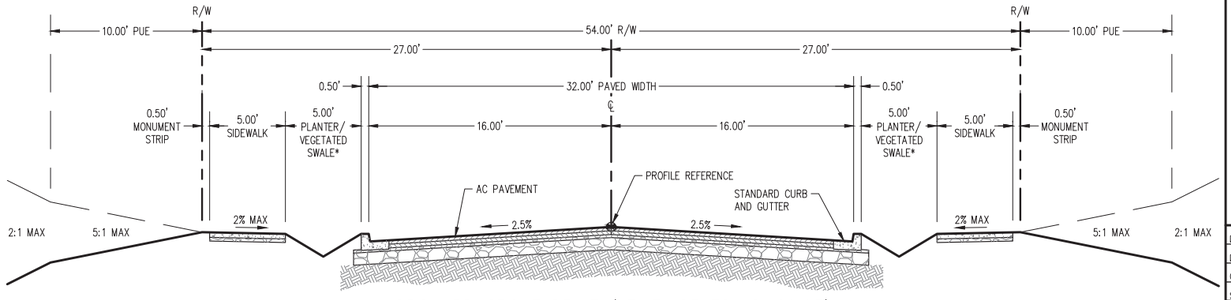
ORCHARD GROVE DRIVE (10+07.60 TO 12+37.17)
PARTIAL ROAD CROSS-SECTION

NOT TO SCALE



ORCHARD GROVE DRIVE (18+29.93 TO 18+66.14)
REDUCED ROAD CROSS-SECTION

NOT TO SCALE



*CONSTRUCT PLANTER/VEGETATED FILTRATION SWALE PER DETAIL ON THIS SHEET AND AT LOCATIONS AS INDICATED ON PLAN.

ORCHARD GROVE DRIVE (17+74.83 TO 18+29.93)
ORCHARD GROVE DRIVE (18+66.14 TO 26+52.82)
WINNIE WAY (30+00.00 TO 33+24.63)
WHEELER FARM ROAD (20+36.12 TO 26+25.80)
LARENCE LANE (12+61.90 TO 14+56.04)
WHEELER WAY (10+00.00 TO 15+93.31)
SKELLENGER WAY (29+45.52 TO 33+26.61)
TOLSTRUP DRIVE (65+26.97 TO 69+06.49)
ROAD CROSS-SECTION

NOT TO SCALE

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WHEELER FARMS

OREGON CITY
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

OREGON
CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

PRELIMINARY STREET CROSS-SECTIONS

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE: 06/20/2017	

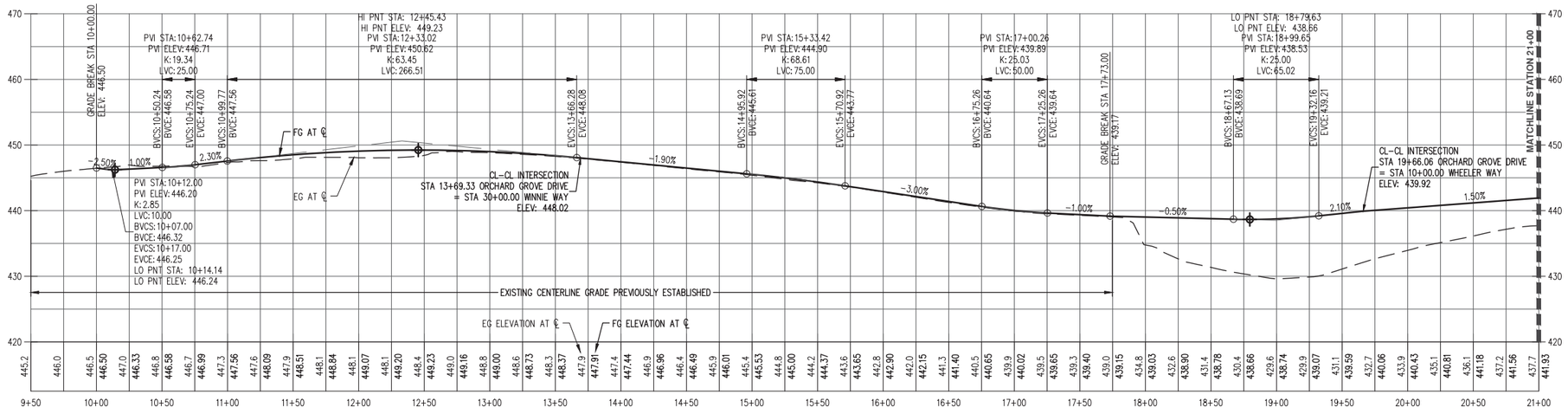
REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 13, 1985
MONTGOMERY B. HURLEY
EXPIRES: 6/30/19
NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/19

REVISIONS

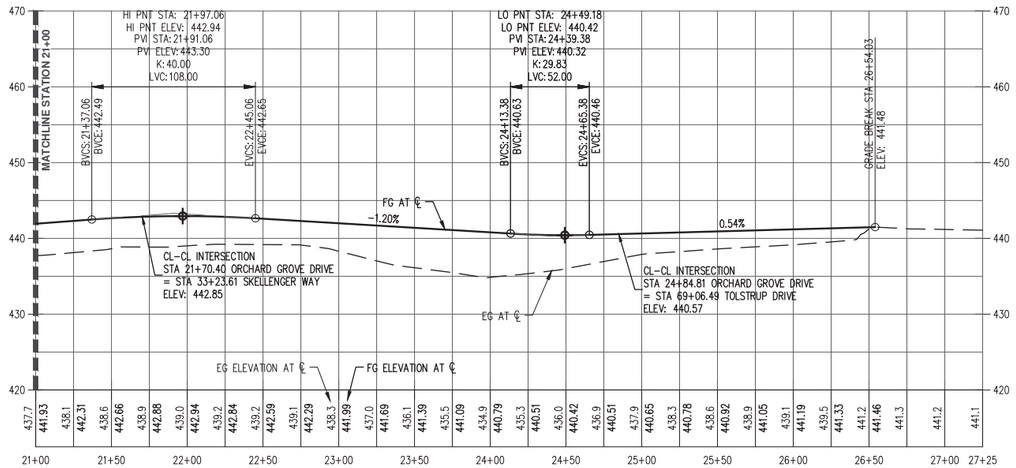
JOB NUMBER
5621

SHEET
P1-12

AKS DRAWING FILE: 5621 STREETS.DWG | LAYOUT: P1-12



ORCHARD GROVE DRIVE [9+50 TO 21+00]
STA = 9+50 TO 21+00
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'



ORCHARD GROVE DRIVE [21+00 TO 27+25]
STA = 21+00 TO 27+25
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'

AKS DRAWING FILE: 5621 STREETS.DWG | LAYOUT: P1-13

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WHEELER FARMS

OREGON

OREGON CITY

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

PRELIMINARY STREET PROFILES

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED

DATE: 06/20/2017

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 9, 2007
MONTGOMERY B. HURLEY
PRELIMINARY
NOT FOR CONSTRUCTION

RENEWAL DATE: 6/30/19

REVISIONS

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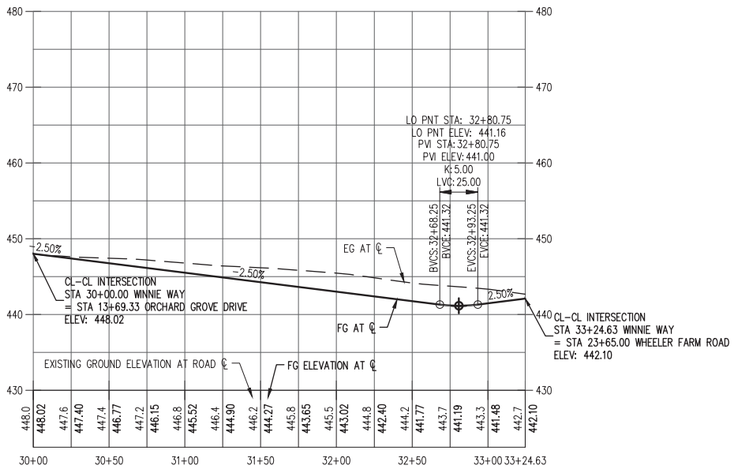
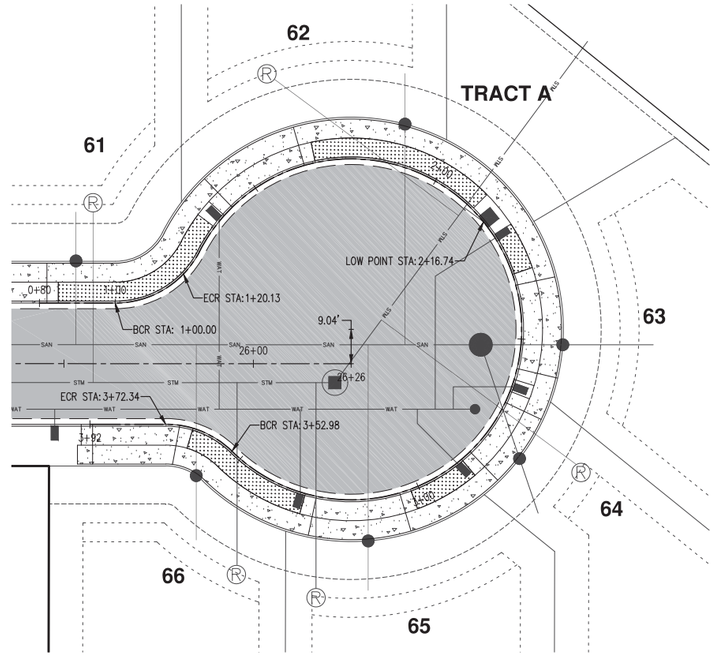
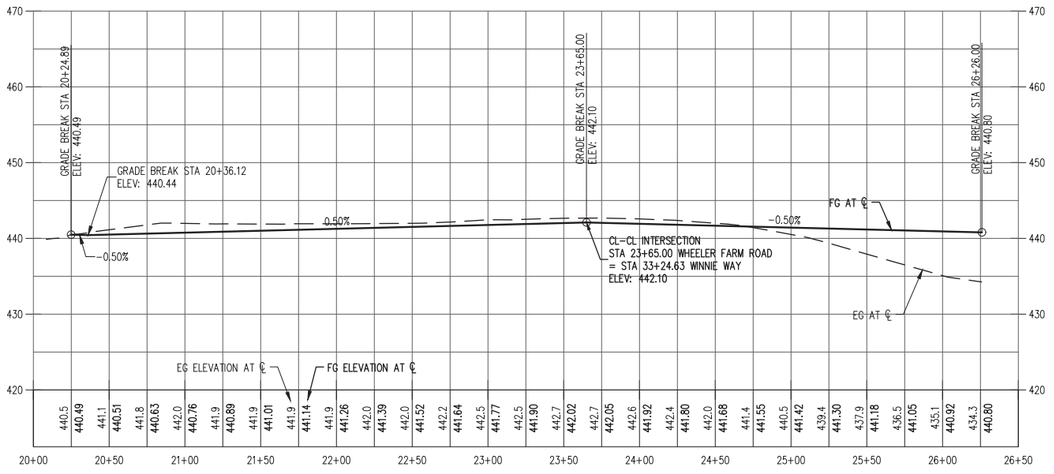
SHEET
P1-13

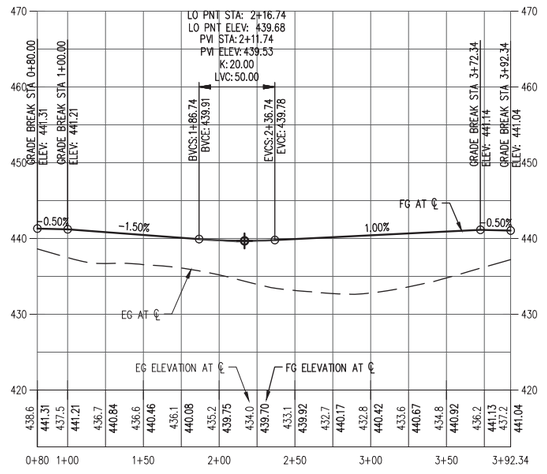


WINNIE WAY
STA = 30+00 TO 33+25
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'





WHEELER FARM ROAD
STA = 20+00 TO 26+50
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'



WHEELER FARM ROAD CUL-DE-SAC
STA = 0+80 TO 3+92
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'

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WHEELER FARMS

OREGON

OREGON CITY

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

PRELIMINARY STREET PROFILES

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE: 06/20/2017	

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 9, 2007
MONTGOMERY B. HURLEY
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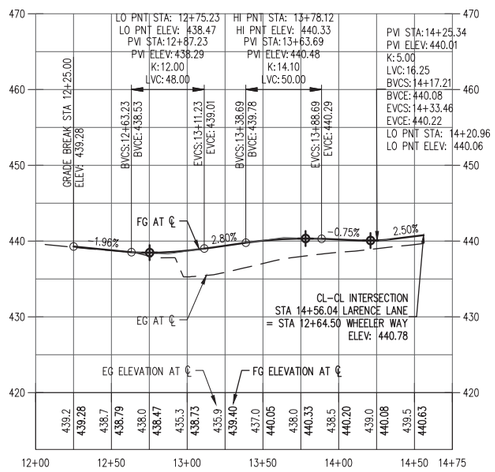
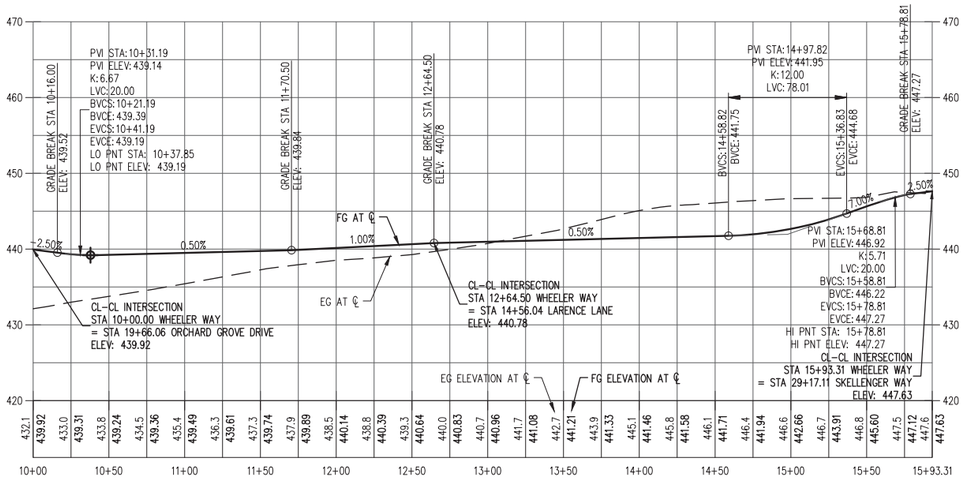
JOB NUMBER
5621

SHEET
P1-14

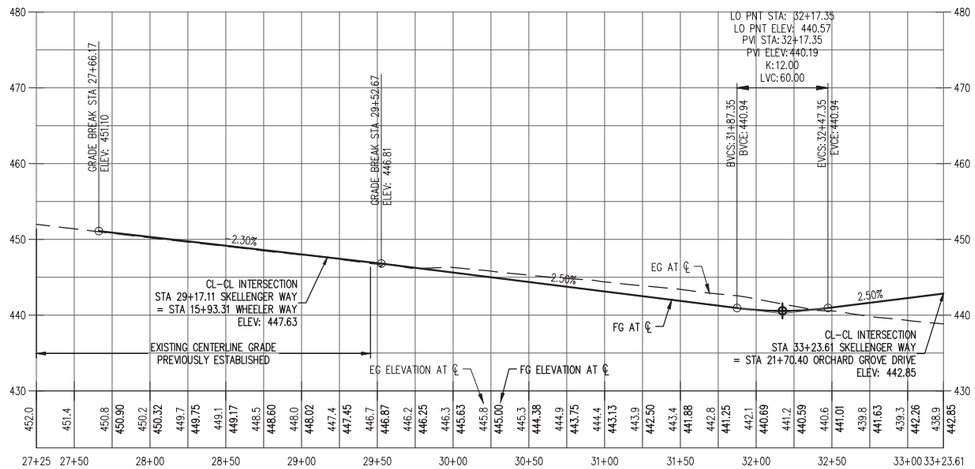
AKS DRAWING FILE: 5621 STREETS.DWG | LAYOUT: P1-14



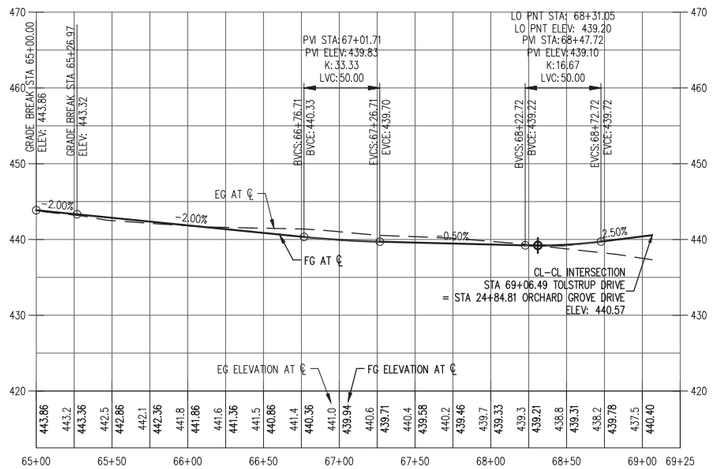
LARENCE LANE
STA = 12+00 TO 14+75
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'



WHEELER WAY
STA = 10+00 TO 15+93
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'



SKELLENGER WAY
STA = 27+25 TO 33+24
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'



TOLSTRUP DRIVE
STA = 65+00 TO 69+25
Hor. Scale: 1"= 50'
Vert. Scale: 1"= 10'

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CLACKAMAS COUNTY TAX MAP 3-2E-07C
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TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

PRELIMINARY STREET PROFILES

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED

DATE: 06/20/2017

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 9, 2001
MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER
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SHEET
P1-15

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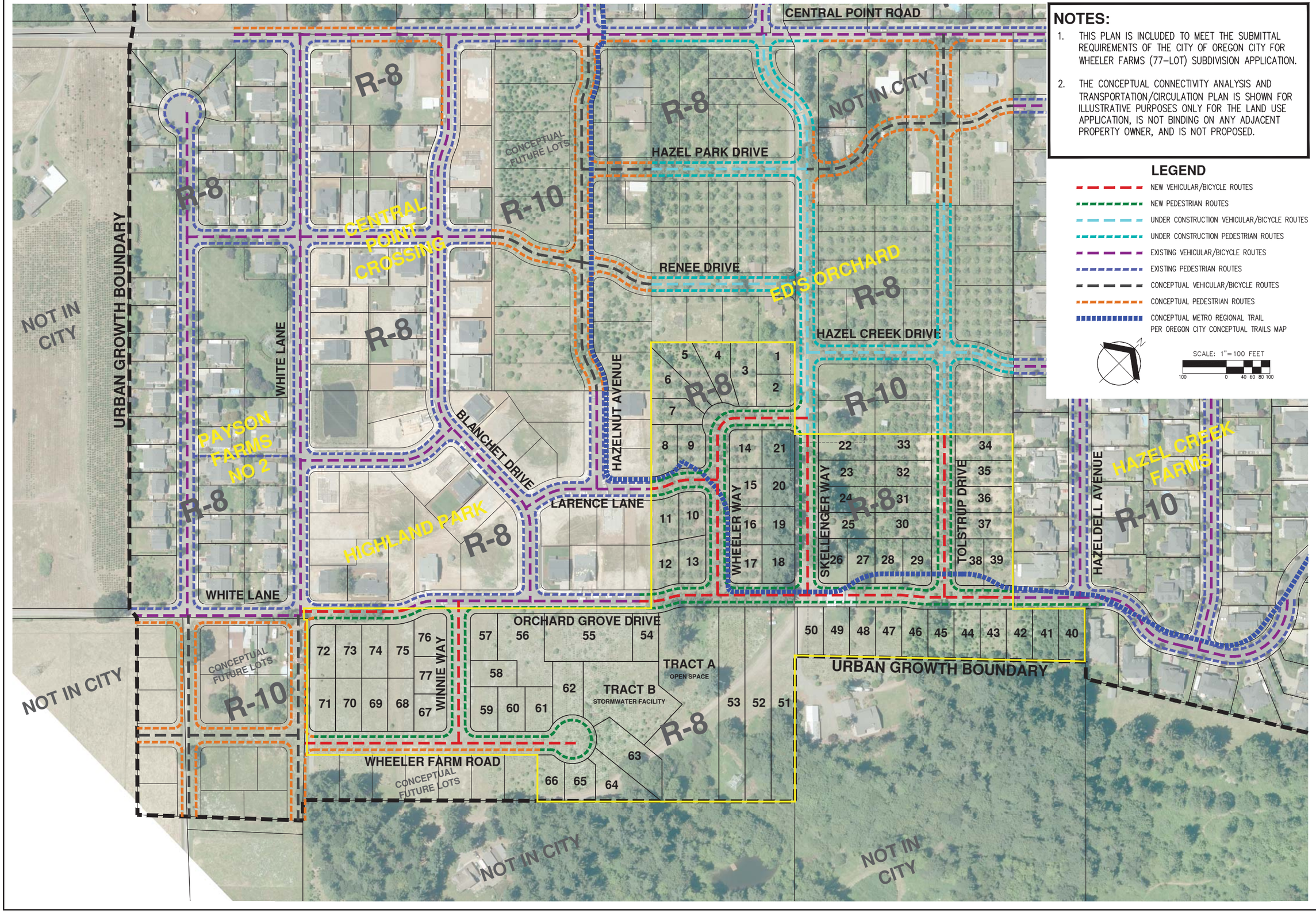

NOTES:

1. THIS PLAN IS INCLUDED TO MEET THE SUBMITTAL REQUIREMENTS OF THE CITY OF OREGON CITY FOR WHEELER FARMS (77-LOT) SUBDIVISION APPLICATION.
2. THE CONCEPTUAL CONNECTIVITY ANALYSIS AND TRANSPORTATION/CIRCULATION PLAN IS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY FOR THE LAND USE APPLICATION, IS NOT BINDING ON ANY ADJACENT PROPERTY OWNER, AND IS NOT PROPOSED.

LEGEND

- NEW VEHICULAR/BICYCLE ROUTES
- NEW PEDESTRIAN ROUTES
- UNDER CONSTRUCTION VEHICULAR/BICYCLE ROUTES
- UNDER CONSTRUCTION PEDESTRIAN ROUTES
- EXISTING VEHICULAR/BICYCLE ROUTES
- EXISTING PEDESTRIAN ROUTES
- CONCEPTUAL VEHICULAR/BICYCLE ROUTES
- CONCEPTUAL PEDESTRIAN ROUTES
- CONCEPTUAL METRO REGIONAL TRAIL PER OREGON CITY CONCEPTUAL TRAILS MAP

SCALE: 1"=100 FEET

100 0 40 60 80 100

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AKS ENGINEERING - SURVEYING - NATURAL RESOURCES
FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE

WHEELER FARMS

OREGON
CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

OREGON CITY
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

PRELIMINARY CONCEPTUAL CONNECTIVITY ANALYSIS, TRAFFIC/TRANSPORTATION, CIRCULATION, & CONCEPTUAL REDEVELOPMENT PLAN

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE:	06/20/2017

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 13, 2006
MONTGOMERY B. HURLEY
MAY 9, 2012
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER
5621

SHEET
P1-16

AKS DRAWING FILE: 5621 ORG.DWG | LAYOUT: P1-16

SCALE: 1"=50 FEET

50 0 20 30 40 50

PROFESSIONAL ISA CERTIFIED ARBORIST

BRUCE R. BALDWIN
CERTIFICATE NUMBER: PN-6666A
EXPIRATION DATE: 12/31/17

TAX LOT 2501
TAX MAP 3 1E 12DD
LOT 21
"PAYSON FARMS NO 2"

TAX LOT 2502
TAX MAP 3 1E 12DD
LOT 22
"PAYSON FARMS NO 2"

TAX LOT 2503
TAX MAP 3 1E 12DD
LOT 23
"PAYSON FARMS NO 2"

TAX LOT 2504
TAX MAP 3 1E 12DD
LOT 24
"PAYSON FARMS NO 2"

TAX LOT 2505
TAX MAP 3 1E 12DD
LOT 25
"PAYSON FARMS NO 2"

TAX LOT 2506
TAX MAP 3 1E 12DD
LOT 26
"PAYSON FARMS NO 2"

TAX LOT 2507
TAX MAP 3 1E 12DD
LOT 27
"PAYSON FARMS NO 2"

TAX LOT 5500
TAX MAP 3 1E 12DA
LOT 26
"HIGHLAND PARK"

TAX LOT 5400
TAX MAP 3 1E 12DA
LOT 25
"HIGHLAND PARK"

TAX LOT 5300
TAX MAP 3 1E 12DA
LOT 24
"HIGHLAND PARK"

TAX LOT 5600
TAX MAP 3 1E 12DA
LOT 27
"HIGHLAND PARK"

TAX LOT 5700
TAX MAP 3 1E 12DA
LOT 28
"HIGHLAND PARK"

TAX LOT 5800
TAX MAP 3 1E 12DA
LOT 29
"HIGHLAND PARK"

TAX LOT 5900
TAX MAP 3 1E 12DA
LOT 30
"HIGHLAND PARK"

TAX LOT 6000
TAX MAP 3 1E 12DA
LOT 31
"HIGHLAND PARK"

TAX LOT 6100
TAX MAP 3 1E 12DA
LOT 32
"HIGHLAND PARK"

TAX LOT 3800
TAX MAP 3 1E 12DA
LOT 9
"HIGHLAND PARK"
SHED

TAX LOT 3900
TAX MAP 3 1E 12DA
LOT 10
"HIGHLAND PARK"

TAX LOT 4000
TAX MAP 3 1E 12DA
LOT 11
"HIGHLAND PARK"
15.00' STORM DRAINAGE EASEMENT

TAX LOT 4400
TAX MAP 3 1E 12DA
LOT 15
"HIGHLAND PARK"

TAX LOT 4800
TAX MAP 3 1E 12DA
LOT 19
"HIGHLAND PARK"

TAX LOT 4700
TAX MAP 3 1E 12DA
LOT 18
"HIGHLAND PARK"

TAX LOT 4600
TAX MAP 3 1E 12DA
LOT 17
"HIGHLAND PARK"

TAX LOT 4500
TAX MAP 3 1E 12DA
LOT 16
"HIGHLAND PARK"

HAZELNUT AVENUE

LARENCE LANE

BLANCHET DRIVE

WHEELER WAY

SKELLENGER WAY

WHITE LANE

ORCHARD GROVE DRIVE

WINNIE WAY

WHEELER FARM ROAD

INGRESS AND EGRESS EASEMENT PER DOC. NO. 94-034242 AND DOC. NO. 94-034243

10.00' PUE

125.00' ELECTRIC TRANSMISSION LINE EASEMENT PER BOOK 619 PAGE 452

TRACT A
VOLUNTARY OPEN SPACE

TRACT B
STORMWATER FACILITY

INGRESS AND EGRESS EASEMENT

FLAGPOLE

SHOP

GRAVEL

TAX LOT 1201
TAX MAP 3 2E 07C

ARBORIST OBSERVATION REQUIRED DURING TREE REMOVAL BEHIND TREE PROTECTION FENCING

LEGEND

- FINISH GRADE CONTOUR (1 FT)
- FINISH GRADE CONTOUR (5 FT) — 450
- EXISTING GROUND CONTOUR (1 FT)
- EXISTING GROUND CONTOUR (5 FT) — 450
- EXISTING TREE TO BE REMOVED
- EXISTING TREE TO REMAIN
- TREE PROTECTION FENCE (4' HIGH ORANGE PLASTIC MESH BARRIER FENCING)
- OPTIMAL TREE ROOT PROTECTION ZONE (1-FOOT RADIUS PER 1-INCH DBH)

NOTE:

THIS PLAN DOES NOT INCLUDE THE TREES THAT COMPRISE THE EXISTING ORCHARDS. THE MAJORITY OF THESE TREES/ORCHARDS HAVE BEEN DETERMINED BY THE PROJECT ARBORIST TO BE DEAD, DISEASED, AND/OR DYING. THIS PLAN ALSO DOES NOT INCLUDE THE CHRISTMAS TREES OR OVERGROWN CHRISTMAS TREES. ADDITIONALLY, THESE PROPERTIES ARE IN FARM DEFERRAL WITH THE CLACKAMAS COUNTY TAX ASSESSOR AND ARE EXEMPT FROM TREE PROTECTION REGULATIONS PER OCMC 17.41.040 AND OCMC 17.41.060.

SEE SHEET P1-19 FOR TREE RESERVATION, REMOVAL, AND MITIGATION TABLE

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FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE

WHEELER FARMS

OREGON CITY — OREGON

TAX LOTS 1700, 1100, 1291, 1001, 1790, 1180 CLACKAMAS CO. TAX MAPS 3S2E07C, 3S1E12D

PRELIMINARY TREE PRESERVATION & REMOVAL PLAN

DESIGNED BY:
DRAWN BY:
CHECKED BY: MBH
SCALE: AS NOTED
DATE: 04/19/2017

REGISTERED PROFESSIONAL LANDSCAPE ARCHITECT — OREGON — PRELIMINARY — NOT FOR CONSTRUCTION — GREGORY B. HURLEY — EXP. 6-30-2019

RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER
5621

SHEET
P1-17

AKS DRAWING FILE: 5621 TREE.DWG | LAYOUT: P1-17

SCALE: 1"=50 FEET

50 0 20 30 40 50

PROFESSIONAL ISA CERTIFIED ARBORIST

BRUCE R. BALDWIN
CERTIFICATE NUMBER: PN-6666A
EXPIRATION DATE: 12/31/17

LEGEND

- FINISH GRADE CONTOUR (1 FT)
- FINISH GRADE CONTOUR (5 FT) — 450
- EXISTING GROUND CONTOUR (1 FT)
- EXISTING GROUND CONTOUR (5 FT) — 450
- EXISTING TREE TO BE REMOVED
- EXISTING TREE TO REMAIN
- TREE PROTECTION FENCE (4' HIGH ORANGE PLASTIC MESH BARRIER FENCING)
- OPTIMAL TREE ROOT PROTECTION ZONE (1-FOOT RADIUS PER 1-INCH DBH)

NOTE:

THIS PLAN DOES NOT INCLUDE THE TREES THAT COMPRISE THE EXISTING ORCHARDS. THE MAJORITY OF THESE TREES/ORCHARDS HAVE BEEN DETERMINED BY THE PROJECT ARBORIST TO BE DEAD, DISEASED, AND/OR DYING. THIS PLAN ALSO DOES NOT INCLUDE THE CHRISTMAS TREES OR OVERGROWN CHRISTMAS TREES. ADDITIONALLY, THESE PROPERTIES ARE IN FARM DEFERRAL WITH THE CLACKAMAS COUNTY TAX ASSESSOR AND ARE EXEMPT FROM TREE PROTECTION REGULATIONS PER OCMC 17.41.040 AND OCMC 17.41.060.

SEE SHEET P1-19 FOR TREE RESERVATION, REMOVAL, AND MITIGATION TABLE

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WHEELER FARMS

OREGON

OREGON CITY
TAX LOTS 1700, 1100, 1291, 1001, 1790, 1180 CLACKAMAS CO. TAX MAPS 3S2E07C, 3S1E12D

PRELIMINARY TREE PRESERVATION & REMOVAL PLAN

DESIGNED BY:
DRAWN BY:
CHECKED BY: MBH
SCALE: AS NOTED
DATE: 04/19/2017

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 9, 2007
MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER 5621

SHEET P1-18

AKS DRAWING FILE: 5621 TREE.DWG | LAYOUT: P1-18

Detailed Tree Inventory for Wheeler Farms

AKS Job No. 5621 - Tree Evaluation: 4/13/2017

Tree #	DBH (in.)	Equivalent DBH (in.)[1]	Tree Species Common Name (*Scientific name*)	Comments	Health Rating*	Structure Rating**	Remove/ Preserve	Within Construction Area[2]	Mitigation Required	Mitigation Trees Required[3]
10010	43	43	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Remove	Yes	Yes	5
10012	54	54	Douglas-fir (*Pseudotsuga menziesii*)	Preserved at the Client's request	1	1	Preserve	Yes	No	0
10018	52	52	Douglas-fir (*Pseudotsuga menziesii*)	Preserved at the Client's request	1	1	Preserve	No	No	0
10029	33	33	Douglas-fir (*Pseudotsuga menziesii*)	Preserved at the Client's request	1	1	Preserve	No	No	0
10030	59	59	Douglas-fir (*Pseudotsuga menziesii*)	Preserved at the Client's request	1	1	Preserve	No	No	0
10033	58	58	Douglas-fir (*Pseudotsuga menziesii*)	Codominant 8' from ground with included bark; Preserved at the Client's request	1	2	Preserve	No	No	0
10057	59	59	Douglas-fir (*Pseudotsuga menziesii*)	Codominant 5' from ground with included bark	1	2	Preserve	Yes	No	0
20114	28	28	Giant Sequoia (*Sequoiadendron giganteum*)	**OFFSITE**	1	1	Preserve	No	No	0
30558	37	37	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
30559	7	7	Cedar (*Cedrus sp.*)		1	1	Preserve	No	No	0
30560	7	7	Cedar (*Cedrus sp.*)		1	1	Preserve	No	No	0
30561	7	7	Cedar (*Cedrus sp.*)		1	1	Preserve	No	No	0
30562	39	39	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
30563	31	31	Douglas-fir (*Pseudotsuga menziesii*)	Sweep	1	1	Preserve	No	No	0
30564	44	44	Douglas-fir (*Pseudotsuga menziesii*)	Sap flow	1	1	Preserve	No	No	0
30566	15	15	Douglas-fir (*Pseudotsuga menziesii*)	Scar at base	1	1	Preserve	No	No	0
30567	10	10	Douglas-fir (*Pseudotsuga menziesii*)	Sweep	1	1	Preserve	No	No	0
30568	46	46	Douglas-fir (*Pseudotsuga menziesii*)	Broken branches	1	1	Preserve	No	No	0
30569	10	10	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
30570	15	15	Douglas-fir (*Pseudotsuga menziesii*)	Crooked	1	2	Preserve	No	No	0
30571	12	12	Douglas-fir (*Pseudotsuga menziesii*)	**OFFSITE**	1	1	Preserve	No	No	0
30572	15	15	Douglas-fir (*Pseudotsuga menziesii*)	**OFFSITE**	1	1	Preserve	No	No	0
30574	14	14	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
30575	10	10	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
30577	9	9	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
30578	9	9	Douglas-fir (*Pseudotsuga menziesii*)	**OFFSITE;** Crooked	1	2	Preserve	No	No	0
30579	13	13	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
30581	17	17	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
30582	12	12	Douglas-fir (*Pseudotsuga menziesii*)	Very sparse foliage; Scar at base	3	2	Preserve	No	No	0
30583	9	9	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
30598	37	37	Douglas-fir (*Pseudotsuga menziesii*)	**OFFSITE;** Broken branches; Dead branches	2	2	Preserve	No	No	0
30599	11	11	Douglas-fir (*Pseudotsuga menziesii*)	**OFFSITE**	1	1	Preserve	No	No	0
30600	13	13	Douglas-fir (*Pseudotsuga menziesii*)	**OFFSITE;** Crooked	1	2	Preserve	No	No	0
30602	12	12	Douglas-fir (*Pseudotsuga menziesii*)	**OFFSITE**	1	1	Preserve	No	No	0
30605	14	14	Cedar (*Cedrus sp.*)	**OFFSITE**	1	1	Preserve	No	No	0
30669	32	32	Willow (*Salix sp.*)	**OFFSITE;** Broken top; Broken branches; Sparse foliage; Cavities; Decay	2	3	Preserve	No	No	0
30670	13	13	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Remove	Yes	Yes	2
30672	31	31	Willow (*Salix sp.*)	Bore holes; Broken branches; Decay at breaks	2	3	Remove	No	No	0
30673	14	14	Willow (*Salix sp.*)	Crooked; Lean (E)	1	2	Remove	No	Yes	6
30674	10	10	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Remove	No	Yes	3
30675	17,20	26	Willow (*Salix sp.*)	Codominant; Bulges at base	1	2	Remove	No	Yes	12
30676	24	24	Oregon Oak (*Quercus garryana*)	Lean (W)	1	2	Remove	Yes	Yes	3
30893	10	10	Douglas-fir (*Pseudotsuga menziesii*)	**OFFSITE**	1	1	Preserve	No	No	0
30929	10	10	Willow (*Salix sp.*)		1	1	Remove	Yes	Yes	1
30970	6,6	8	English Hawthorn (*Crataegus monogyna*)	Codominant; Bore holes	1	2	Remove	Yes	Yes	1
32171	10	10	Cherry (*Prunus sp.*)	**OFFSITE**	1	1	Preserve	No	No	0
32172	9	9	Cherry (*Prunus sp.*)	**OFFSITE**	1	1	Preserve	No	No	0
32175	21	21	Spruce (*Picea sp.*)	**OFFSITE**	1	1	Preserve	No	No	0
32180	9	9	Cherry (*Prunus sp.*)	**OFFSITE**	1	1	Preserve	No	No	0
32190	17	17	European White Birch (*Betula pendula*)	**OFFSITE;** Bore holes	1	2	Preserve	No	No	0
32191	7	7	European White Birch (*Betula pendula*)	**OFFSITE;** Bore holes	1	2	Preserve	No	No	0
32192	14	14	European White Birch (*Betula pendula*)	**OFFSITE;** Bore holes	1	2	Preserve	No	No	0
32193	20	20	European White Birch (*Betula pendula*)	**OFFSITE;** Bore holes	1	2	Preserve	No	No	0
32194	14	14	European White Birch (*Betula pendula*)	**OFFSITE;** Bore holes	1	2	Preserve	No	No	0
32227	8,27	28	Willow (*Salix sp.*)	Codominant; Broken branches; Dead top; Decay	2	3	Remove	Yes	No	0
32229	12,14	18	Willow (*Salix sp.*)	Codominant	1	1	Preserve	Yes	No	0
32231	25	25	Willow (*Salix sp.*)	Snag	3	3	Preserve	Yes	No	0
32232	16	16	Douglas-fir (*Pseudotsuga menziesii*)	sweep; Crooked	1	2	Preserve	Yes	No	0
32235	7	7	Cherry (*Prunus sp.*)	**OFFSITE**	1	1	Preserve	No	No	0
32236	27	27	Douglas-fir (*Pseudotsuga menziesii*)	**OFFSITE**	1	1	Preserve	No	No	0
32237	33	33	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32238	7	7	Bigleaf Maple (*Acer macrophyllum*)	**OFFSITE**	1	1	Preserve	No	No	0
32239	7,8,24	26	Bigleaf Maple (*Acer macrophyllum*)	Codominant	1	1	Preserve	Yes	No	0
32240	12	12	Bigleaf Maple (*Acer macrophyllum*)		1	1	Preserve	Yes	No	0
32241	9	9	Bigleaf Maple (*Acer macrophyllum*)		1	1	Preserve	Yes	No	0
32242	15	15	Bigleaf Maple (*Acer macrophyllum*)		1	1	Preserve	Yes	No	0
32243	40	40	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32245	21	21	Bigleaf Maple (*Acer macrophyllum*)		1	1	Preserve	Yes	No	0
32246	39	39	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32247	8	8	Willow (*Salix sp.*)	Cavity with decay	2	2	Preserve	Yes	No	0
32248	6,19	20	Bigleaf Maple (*Acer macrophyllum*)	Codominant; Large swell at base; Many large bulges	2	3	Preserve	No	No	0
32249	6	6	Bigleaf Maple (*Acer macrophyllum*)		1	1	Preserve	No	No	0
32250	8	8	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32251	20	20	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32252	10,11,17	23	Bigleaf Maple (*Acer macrophyllum*)	Codominant	1	1	Preserve	No	No	0
32253	7	7	Bigleaf Maple (*Acer macrophyllum*)		1	1	Preserve	Yes	No	0
32254	8	8	Cherry (*Prunus sp.*)		1	1	Preserve	Yes	No	0
32255	8	8	Bigleaf Maple (*Acer macrophyllum*)	**OFFSITE**	1	1	Preserve	No	No	0
32256	12	12	Bigleaf Maple (*Acer macrophyllum*)	**OFFSITE;** Sweep	2	2	Preserve	No	No	0
32257	8	8	Bigleaf Maple (*Acer macrophyllum*)	**OFFSITE;** Sweep	2	2	Preserve	No	No	0
32259	25	25	Douglas-fir (*Pseudotsuga menziesii*)	Crooked	1	2	Preserve	Yes	No	0
32260	11	11	DECIDUOUS	Whole tree failure	3	3	Preserve	Yes	No	0
32266	13,18	22	Oregon Oak (*Quercus garryana*)	Codominant	1	1	Preserve	No	No	0
32270	17	17	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32271	8	8	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32272	13	13	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32273	16	16	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32274	9	9	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32275	13	13	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32276	13	13	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32277	8	8	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32278	9	9	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32279	9	9	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0

Detailed Tree Inventory for Wheeler Farms

AKS Job No. 5621 - Tree Evaluation: 4/13/2017

Tree #	DBH (in.)	Equivalent DBH (in.)[1]	Tree Species Common Name (*Scientific name*)	Comments	Health Rating*	Structure Rating**	Remove/ Preserve	Within Construction Area[2]	Mitigation Required	Mitigation Trees Required[3]
32280	12	12	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32281	8	8	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32282	8	8	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32283	11,14	18	Douglas-fir (*Pseudotsuga menziesii*)	Codominant	1	1	Preserve	No	No	0
32284	12	12	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32285	17	17	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32286	12	12	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32287	7	7	Pacific Madrone (*Arbutus menziesii*)	Significant lean (W)	1	2	Preserve	No	No	0
32288	17	17	Douglas-fir (*Pseudotsuga menziesii*)	Crooked top	1	2	Preserve	No	No	0
32289	20	20	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32290	14,17	22	Willow (*Salix sp.*)	Codominant; 17" Stem - Crooked; 14" Stem - Broken top	2	2	Preserve	No	No	0
32291	20	20	Bigleaf Maple (*Acer macrophyllum*)	Broken scaffold; Decay; Broken branches	2	2	Preserve	No	No	0
32292	17	17	Douglas-fir (*Pseudotsuga menziesii*)	Very crooked; Broken stem; Decay	2	3	Preserve	Yes	No	0
32293	37	37	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32294	31	31	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	Yes	No	0
32295	22	22	Willow (*Salix sp.*)		1	1	Preserve	Yes	No	0
32296	12	12	Douglas-fir (*Pseudotsuga menziesii*)	Crooked	1	2	Preserve	Yes	No	0
32297	13	13	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32299	11	11	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32300	37	37	Douglas-fir (*Pseudotsuga menziesii*)		1	1	Preserve	No	No	0
32312	12	12	Willow (*Salix sp.*)		1	1	Preserve	No	No	0
32313	8	8	DECIDUOUS	Snag	3	3	Preserve	No	No	0
32314	18	18	Willow (*Salix sp.*)	Broken top; Decay	2	2	Preserve	No	No	0
32315	11,19	22	Willow (*Salix sp.*)	Codominant; 14" Stem - Large cavity with decay	2	2	Preserve	No	No	0
32326	36	36	Oregon Oak (*Quercus garryana*)	Broken top; Decay; Broken branches	2	3	Preserve	No	No	0
32329	15	15	Bigleaf Maple (*Acer macrophyllum*)		1	1	Preserve	No	No	0
32330	8	8	Bigleaf Maple (*Acer macrophyllum*)		1	1	Preserve	No	No	0
32331	19	19	Bigleaf Maple (*Acer macrophyllum*)	Broken branches; Broken top; Decay	3	3	Remove	No	No	0
32332	20	20	Bigleaf Maple (*Acer macrophyllum*)	Bulges on bole	2	2	Preserve	No	No	0
32333	27	27	Oregon Oak (*Quercus garryana*)		1	1	Preserve	No	No	0
32334	22,24	33	Willow (*Salix sp.*)	Codominant; Crooked	1	2	Preserve	Yes	No	0
32335	20	20	Willow (*Salix sp.*)	Broken scaffold; Significant decay; Crooked	2	3	Remove	Yes	No	0
32336	12,21	24	Bigleaf Maple (*Acer macrophyllum*)	Codominant; Large bulges on bole; Broken top; Decay	2	3	Remove	No	No	0
32337	40	40	Bigleaf Maple (*Acer macrophyllum*)	Sweep	1	2	Preserve	No	No	0
32362	8	8	Grand Fir (*Abies grandis*)	**OFFSITE**	1	1	Preserve	No	No	0
32363	7	7	Grand Fir (*Abies grandis*)	**OFFSITE**	1	1	Preserve	No	No	0
32364	7	7	Grand Fir (*Abies grandis*)	**OFFSITE**	1	1	Preserve	No	No	0
32365	8	8	Grand Fir (*Abies grandis*)	**OFFSITE**	1	1	Preserve	No	No	0
32366	6	6	Grand Fir (*Abies grandis*)	**OFFSITE**	1	1	Preserve	No	No	0
32367	6	6	Grand Fir (*Abies grandis*)	**OFFSITE**	1	1	Preserve	No	No	0
32368	7	7	Grand Fir (*Abies grandis*)	**OFFSITE**	1	1	Preserve	No	No	0
32369	7	7	Grand Fir (*Abies grandis*)	**OFFSITE**	1	1	Preserve	No	No	0
32370	11	11	Grand Fir (*Abies grandis*)	**OFFSITE**	1	1	Preserve	No	No	0
32371	8	8	Grand Fir (*Abies grandis*)	**OFFSITE**	1	1	Preserve	No	No	0
32372	10,13	16	Cedar (*Cedrus sp.*)	**OFFSITE;** Codominant	1	1	Preserve	No	No	0
32373	13	13	Cedar (*Cedrus sp.*)	**OFFSITE**	1	1	Preserve	No	No	0
32374	14	14	Cedar (*Cedrus sp.*)	**OFFSITE**	1	1	Preserve	No	No	0
32375	7	7	Fir (*Abies sp.*)	**OFFSITE**	1	1	Preserve	No	No	0
32380	6,6	8	English Hawthorn (*Crataegus monogyna*)	Codominant	1	1	Remove	No	Yes	3
32404	7	7	Grand Fir (*Abies grandis*)	**OFFSITE**	1	1	Preserve	No	No	0
32405	7	7	Grand Fir (*Abies grandis*)	**OFFSITE**	1	1	Preserve	No	No	0
32623	12	12	Bigleaf Maple (*Acer macrophyllum*)		1	1	Preserve	No	No	0
50078	26	26	Oregon Oak (*Quercus garryana*)		1	1	Preserve	No	No	0
50253	4	4	Deciduous	**OFFSITE;** Not evaluated by an Arborist	1	1	Preserve	No	No	0
50254	5	5	Deciduous	**OFFSITE;** Not evaluated by an Arborist	1	1	Preserve	No	No	0

Total # of Existing Trees Inventoried = 148
Total # of Trees to be Removed Requiring Mitigation = 9
Total # of Mitigation Trees Required = 36

Total # of Onsite Trees = 104
Total # of Onsite Trees to be Preserved = 90
Total # of Onsite Trees to be Removed = 14

Total # of Offsite Trees = 44
Total # of Offsite Trees to be Preserved = 44
Total # of Offsite Trees to be Removed = 0

[1]Equivalent DBH (in.):
Equivalent DBH (in.) Based on Basal Area.

[2]Within Construction Area:
Construction area is defined as right-of-way, public utility easements, and within the building footprint of a building site for any mixed-use, commercial or industrial development, or if a residential development, within the allowable building footprint permitted by the setback requirements of the zone district. (Per OCMC 17.04.230)

[3]Mitigation Trees Required:
Per Tree Replacement Requirements Table 17.41.060-1 OCMC

***Health Rating:**
1 = Good Health - A tree that exhibits typical foliage, bark, and root characteristics, for its respective species, shows no signs of infection or infestation, and has a high level of vigor and vitality.
2 = Fair Health - A tree that exhibits some abnormal health characteristics and/or shows some signs of infection or infestation, but may be reversed or abated with supplemental treatment.
3 = Poor Health - A tree that is in significant decline, to the extent that supplemental treatment would not likely result in reversing or abating its decline.

****Structure Rating:**
1 = Good Structure - A tree that exhibits typical physical form characteristics, for its respective species, shows no signs of structural defects of the canopy, trunk, and/or root system.
2 = Fair Structure - A tree that exhibits some abnormal physical form characteristics and/or some signs of structural defects, which reduce the structural integrity of the tree, but are not indicative of imminent physical failure, and may be corrected using arboricultural abatement methods.
3 = Poor Structure - A tree that exhibits extensively abnormal physical form characteristics and/or significant structural defects that substantially reduces the structural viability of the tree, cannot feasibly be abated, and are indicative of imminent physical failure.

Arborist Disclosure Statement:
Arborists are tree specialists who use their education, knowledge, training, and experience to examine trees, recommend measures to enhance the health of trees, and attempt to reduce the risk of living near trees. The Client and Jurisdiction may choose to accept or disregard the recommendations of the arborist, or seek additional advice. Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like medicine, cannot be guaranteed. Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees. Neither this author nor AKS Engineering & Forestry, LLC have assumed any responsibility for liability associated with the trees on or adjacent to this site.

At the completion of construction, all trees should once again be reviewed. Land clearing and removal of adjacent trees can expose previously unseen defects and otherwise healthy trees can be damaged during construction.

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ENGINEERING - SURVEYING - NATURAL RESOURCES
FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE

WHEELER FARMS

OREGON CITY
TAX LOTS 1700, 1100, 1291, 1001, 1790, 1180

OREGON
CLACKAMAS CO., TAX MAPS 3S2E07C, 3S1E12D

PRELIMINARY TREE PRESERVATION AND REMOVAL TABLE

DESIGNED BY:
DRAWN BY:
CHECKED BY: MBH
SCALE: AS NOTED
DATE: 04/19/2017

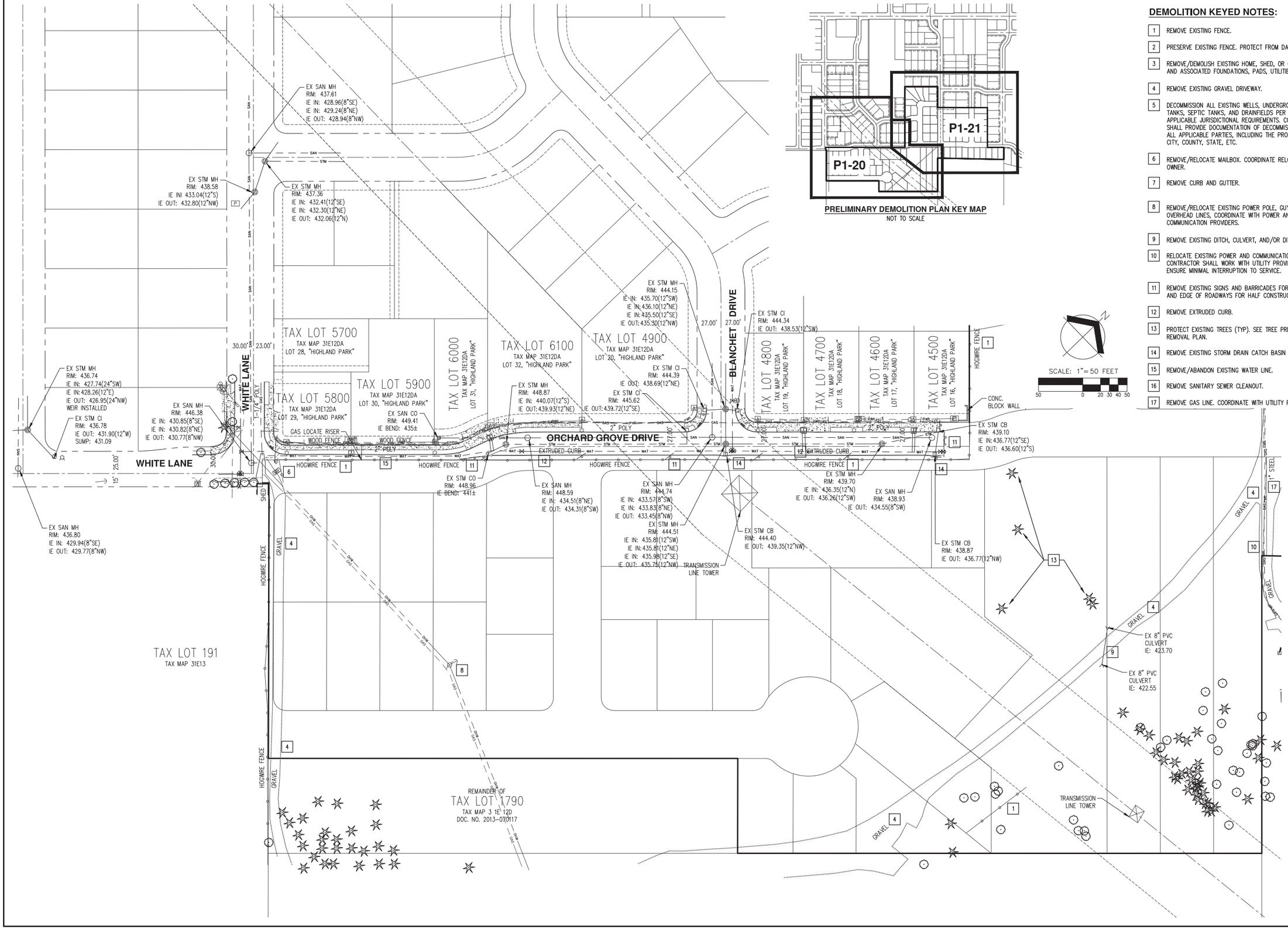
REGISTERED PROFESSIONAL FORESTER
OREGON
MAY 9, 2006
MONTGOMERY B. HURLEY
PRELIMINARY - NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER
5621

SHEET
P1-19

AKS DRAWING FILE: 5621 TREE TABLE.DWG | LAYOUT: P1-19



PRELIMINARY DEMOLITION PLAN KEY MAP
NOT TO SCALE

DEMOLITION KEYED NOTES:

1. REMOVE EXISTING FENCE.
2. PRESERVE EXISTING FENCE. PROTECT FROM DAMAGE.
3. REMOVE/DEMOLISH EXISTING HOME, SHED, OR CONTAINER, AND ASSOCIATED FOUNDATIONS, PADS, UTILITIES, ETC.
4. REMOVE EXISTING GRAVEL DRIVEWAY.
5. DECOMMISSION ALL EXISTING WELLS, UNDERGROUND FUEL TANKS, SEPTIC TANKS, AND DRAINFIELDS PER ALL APPLICABLE JURISDICTIONAL REQUIREMENTS. CONTRACTOR SHALL PROVIDE DOCUMENTATION OF DECOMMISSIONING TO ALL APPLICABLE PARTIES, INCLUDING THE PROJECT ENGINEER, CITY, COUNTY, STATE, ETC.
6. REMOVE/RELOCATE MAILBOX. COORDINATE RELOCATION WITH OWNER.
7. REMOVE CURB AND GUTTER.
8. REMOVE/RELOCATE EXISTING POWER POLE, GUY WIRES, AND OVERHEAD LINES, COORDINATE WITH POWER AND COMMUNICATION PROVIDERS.
9. REMOVE EXISTING DITCH, CULVERT, AND/OR DITCH INLET.
10. RELOCATE EXISTING POWER AND COMMUNICATION LINES. CONTRACTOR SHALL WORK WITH UTILITY PROVIDERS TO ENSURE MINIMAL INTERRUPTION TO SERVICE.
11. REMOVE EXISTING SIGNS AND BARRICADES FOR END OF ROAD AND EDGE OF ROADWAYS FOR HALF CONSTRUCTED STREETS
12. REMOVE EXTRUDED CURB.
13. PROTECT EXISTING TREES (TYP). SEE TREE PRESERVATION AND REMOVAL PLAN.
14. REMOVE EXISTING STORM DRAIN CATCH BASIN AND LEAD.
15. REMOVE/ABANDON EXISTING WATER LINE.
16. REMOVE SANITARY SEWER CLEANOUT.
17. REMOVE GAS LINE. COORDINATE WITH UTILITY PROVIDER.

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WHEELER FARMS
OREGON

OREGON CITY
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

PRELIMINARY DEMOLITION PLAN

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE:	06/20/2017

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 08, 2008
MONTGOMERY B. HURLEY
EXPIRES: 6/30/19
PRELIMINARY NOT FOR CONSTRUCTION

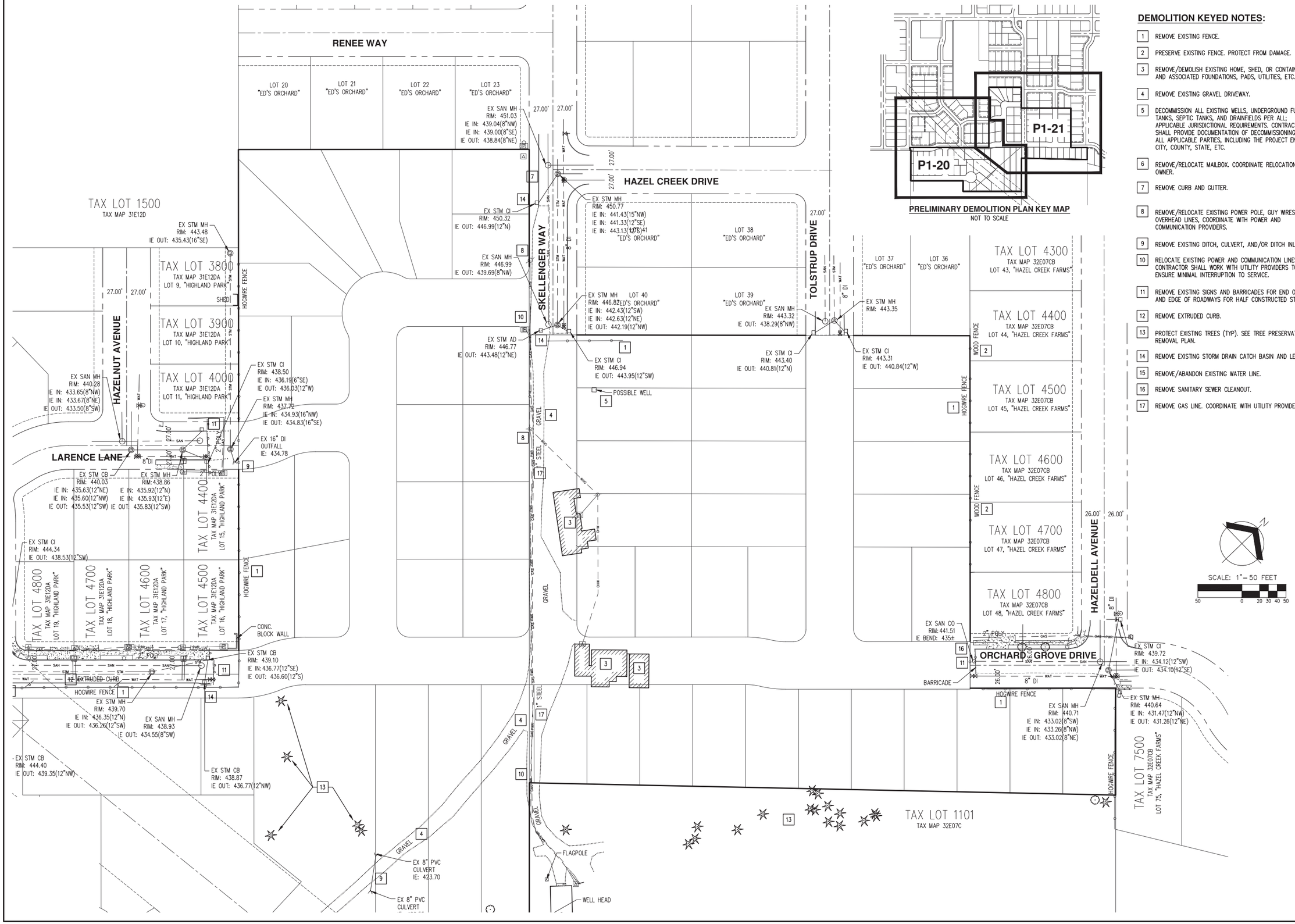
RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER
5621

SHEET
P1-20

AKS DRAWING FILE: 5621 DEMO.DWG | LAYOUT: P1-20



DEMOLITION KEYED NOTES:

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4. REMOVE EXISTING GRAVEL DRIVEWAY.
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15. REMOVE/ABANDON EXISTING WATER LINE.
16. REMOVE SANITARY SEWER CLEANOUT.
17. REMOVE GAS LINE. COORDINATE WITH UTILITY PROVIDER.

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FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE

WHEELER FARMS

OREGON
CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

OREGON CITY
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

PRELIMINARY DEMOLITION PLAN

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE:	06/20/2017

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 15, 2005
MONTGOMERY B. HURLEY
NOT FOR CONSTRUCTION
EXPIRES: JULY 9, 2019

RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER 5621

SHEET P1-21

AKS DRAWING FILE: 5621 DEMO.DWG | LAYOUT: P1-21

LEGEND:

209 – STREET TREE, 2" CAL. (MIN.)

EXISTING TREE TO REMAIN

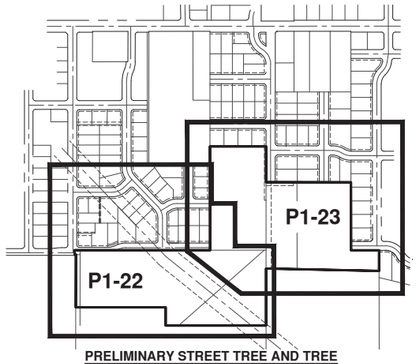
TOTAL STREET TREES: 209
REQUIRED STREET TREES (1 FOR EVERY 35' PROP. FRONTAGE) = 209
NO FEE IN-LIEU OF STREET TREES IS NECESSARY IN ORDER TO MEET THE MINIMUM STREET TREE REQUIREMENT.
NOTE: ALL STREET TREES FOR PROJECT SHOWN ON P1-22 AND P1-23 ARE INCLUDED IN THIS TABLE.

STREET TREE NOTES:

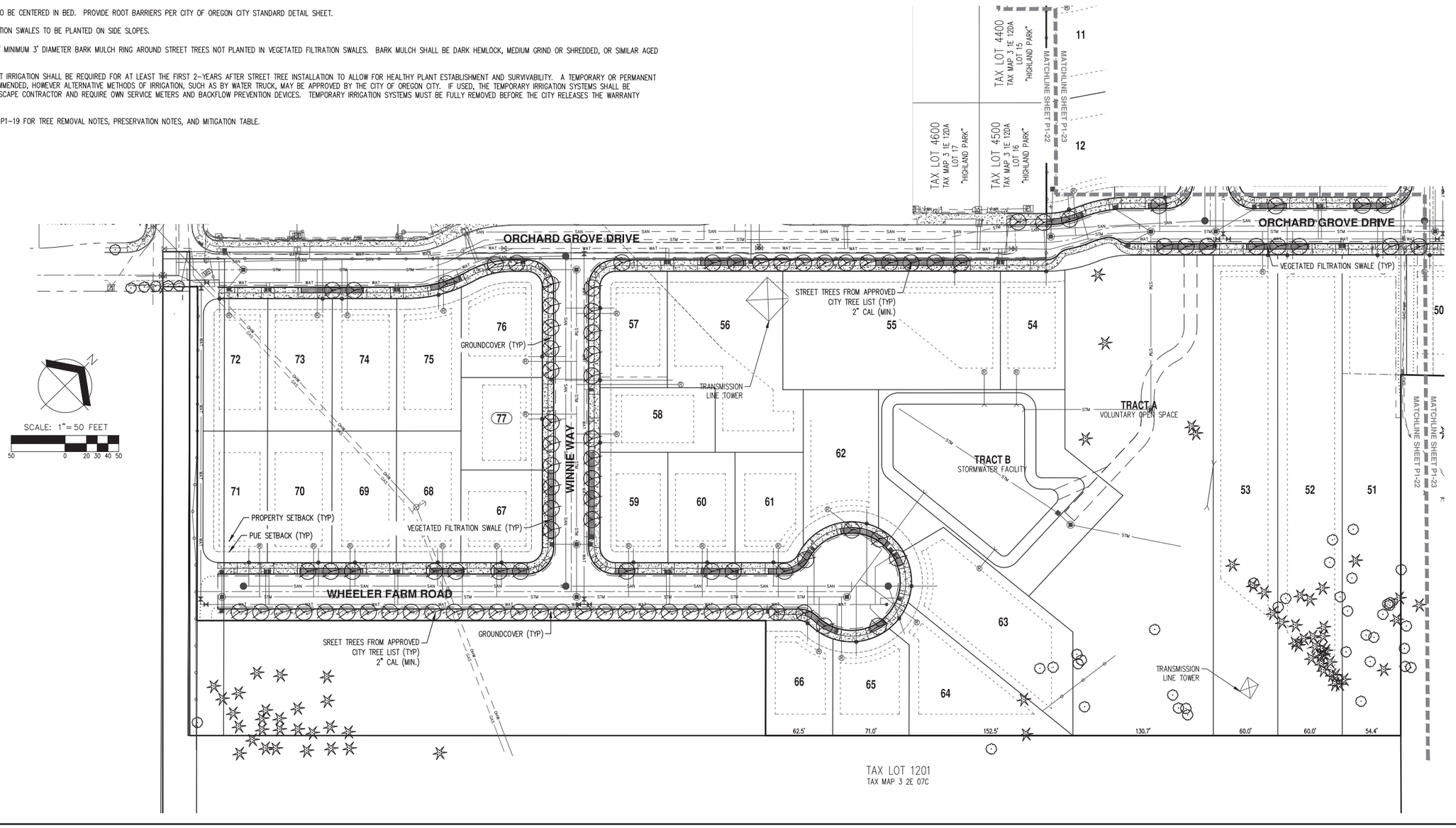
1. LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR VERIFYING PLANT AND MATERIAL QUANTITIES. IF DISCREPANCIES OCCUR, DESIGN INTENT PREVAILS OVER QUANTITIES LISTED.
2. STREET TREE PLAN IS PRELIMINARY AND INTENDED TO SHOW DESIGN INTENT. APPROPRIATE SUBSTITUTIONS TO PLANT SPECIES, SPACING, LAYOUT, ETC. MAY BE MADE PRIOR TO INSTALLATION DUE TO UNFORESEEN SITE CONSTRAINTS, FINAL DRIVEWAY LOCATIONS, UTILITIES, AND PLANT AVAILABILITY. CHANGES/SUBSTITUTIONS MUST BE APPROVED IN WRITING AND BE IN ACCORDANCE WITH APPLICABLE CITY OF OREGON CITY STANDARDS.
3. ALL PLANTER STRIPS ALONG THE STREET NOT PLANTED AS A VEGETATED FILTRATION SWALE SHALL HAVE DROUGHT TOLERANT VEGETATIVE GROUNDCOVER, SUCH AS KINNIKINNICK, INSTALLED BY THE ADJACENT HOMEOWNER/HOME BUILDER. VEGETATED FILTRATION SWALE SHRUBS AND GROUNDCOVERS SHALL BE SELECTED FROM TABLE A-1 IN THE OREGON CITY STORMWATER AND GRADING DESIGN STANDARDS MANUAL.
4. CONTRACTOR SHALL INSTALL STREET TREES AND PLANTINGS IN STREET FRONTAGE ADJACENT TO OPEN SPACE TRACTS. ALL OTHER STREET TREES AND PLANTINGS SHALL BE INSTALLED BY THE HOMEBUILDER AT THE TIME OF ADJACENT HOME CONSTRUCTION. IT SHALL BE THE ONGOING RESPONSIBILITY OF THE ABUTTING PROPERTY OWNER TO MAINTAIN AND WATER TREES AND VEGETATION WITHIN THE PLANTING STRIPS AND VEGETATED FILTRATION SWALES ADJACENT TO LOTS. MAINTENANCE SHALL INCLUDE, BUT NOT BE LIMITED TO, PRUNING TO REMOVE DEAD BRANCHES AND DANGEROUS LIMBS, WEED AND TRASH REMOVAL, AND TO MAINTAIN ADEQUATE CLEARANCE ABOVE ALL SIDEWALKS AND ROADS FOR PEDESTRIANS AND STREET CLEANING EQUIPMENT OPERATION.
5. TREES TO BE PLANTED SHALL MEET THE REQUIREMENTS OF THE AMERICAN ASSOCIATION OF NURSERYMEN (AAN) STANDARDS FOR NURSERY STOCK (ANSI Z60.1) FOR GRADE NO. 1 OR BETTER. DOUBLE STAKE ALL TREES. ADJUST STREET TREES AS NECESSARY TO AVOID CONFLICTS WITH UTILITIES, LIGHT POLES, ETC. THE FOLLOWING CLEARANCE DISTANCES SHALL BE MAINTAINED WHEN PLANTING TREES: 15' O.C. FROM STREET LIGHTS; 5' O.C. FROM FIRE HYDRANTS; AND 20' FROM INTERSECTIONS PER OREGON CITY CODE 1208.015.
6. TREES IN PLANTER STRIPS TO BE CENTERED IN BED. PROVIDE ROOT BARRIERS PER CITY OF OREGON CITY STANDARD DETAIL SHEET.
7. TREES IN VEGETATED FILTRATION SWALES TO BE PLANTED ON SIDE SLOPES.
8. MULCH: APPLY 3" DEEP BY MINIMUM 3' DIAMETER BARK MULCH RING AROUND STREET TREES NOT PLANTED IN VEGETATED FILTRATION SWALES. BARK MULCH SHALL BE DARK HEMLOCK, MEDIUM GRIND OR SHREDDED, OR SIMILAR AGED BARK MULCH.
6. IRRIGATION: WATER-EFFICIENT IRRIGATION SHALL BE REQUIRED FOR AT LEAST THE FIRST 2-YEARS AFTER STREET TREE INSTALLATION TO ALLOW FOR HEALTHY PLANT ESTABLISHMENT AND SURVIVABILITY. A TEMPORARY OR PERMANENT IRRIGATION SYSTEM IS RECOMMENDED, HOWEVER ALTERNATIVE METHODS OF IRRIGATION, SUCH AS BY WATER TRUCK, MAY BE APPROVED BY THE CITY OF OREGON CITY. IF USED, THE TEMPORARY IRRIGATION SYSTEMS SHALL BE DESIGN-BUILD BY THE LANDSCAPE CONTRACTOR AND REQUIRE OWN SERVICE METERS AND BACKFLOW PREVENTION DEVICES. TEMPORARY IRRIGATION SYSTEMS MUST BE FULLY REMOVED BEFORE THE CITY RELEASES THE WARRANTY SURETY BOND.
7. REFER TO SHEETS P1-17 – P1-19 FOR TREE REMOVAL NOTES, PRESERVATION NOTES, AND MITIGATION TABLE.

TREE MITIGATION AND STREET TREE NOTES:

1. MITIGATION PLANTING WILL BE PROVIDED ON OR OFF SITE (OPTION 1) AND/OR CASH-IN-LIEU OF PLANTING (OPTION 4) PER OCMC 17.41.060.
2. ON AND OFF SITE PLANTINGS WILL BE EITHER 2" CALIPER DECIDUOUS TREES OR 6' TALL CONIFER TREES PER OCMC TABLE 17.41.060-1.
3. SPECIES WILL BE SPECIFIED BY PROJECT LANDSCAPE ARCHITECT OR ARBORIST DURING FINAL DESIGN AND WILL BE FROM THE CITY'S APPROVED TREE LIST.
4. STREET TREES WITHIN THE PLANTERS (VEGETATED FILTRATION SWALES) WILL BE SELECTED FROM TABLE A-1 IN THE OREGON CITY STORMWATER AND GRADING DESIGN STANDARDS MANUAL.



PRELIMINARY STREET TREE AND TREE MITIGATION PLAN KEY MAP
NOT TO SCALE



SCALE: 1"=50 FEET

50 0 20 30 40 50

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WHEELER FARMS

OREGON CITY, OREGON
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790
CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

PRELIMINARY STREET TREE AND TREE MITIGATION PLAN

DESIGNED BY:	NKP
DRAWN BY:	NKP
CHECKED BY:	KAH
SCALE:	AS NOTED

DATE: 06/20/2017

REGISTERED LANDSCAPE ARCHITECT
KIRSTEN A. HADSWORTH
OREGON
PRELIMINARY NOT FOR CONSTRUCTION
06/06/13

REVISIONS

JOB NUMBER
5621

SHEET
P1-22

AKS DRAWING FILE: 5621 LANDSCAPE.DWG | LAYOUT: P1-22

TOTAL STREET TREES: 209

REQUIRED STREET TREES (1 FOR EVERY 35' PROP. FRONTAGE) = 209

NO FEE IN-LIEU OF STREET TREES IS NECESSARY IN ORDER TO MEET THE MINIMUM STREET TREE REQUIREMENT.

NOTE: ALL STREET TREES FOR PROJECT SHOWN ON P1-22 AND P1-23 ARE INCLUDED IN THIS TABLE.

LEGEND:

209 – STREET TREE, 2" CAL. (MIN.)

EXISTING TREE TO REMAIN

TREE MITIGATION AND STREET TREE NOTES:

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2. ON AND OFF SITE PLANTINGS WILL BE EITHER 2" CALIPER DECIDUOUS TREES OR 6' TALL CONIFER TREES PER OCMC TABLE 17.41.060-1.
3. SPECIES WILL BE SPECIFIED BY PROJECT LANDSCAPE ARCHITECT OR ARBORIST DURING FINAL DESIGN AND WILL BE FROM THE CITY'S APPROVED TREE LIST.
4. STREET TREES WITHIN THE PLANTERS (VEGETATED FILTRATION SWALES) WILL BE SELECTED FROM TABLE A-1 IN THE OREGON CITY STORMWATER AND GRADING DESIGN STANDARDS MANUAL.

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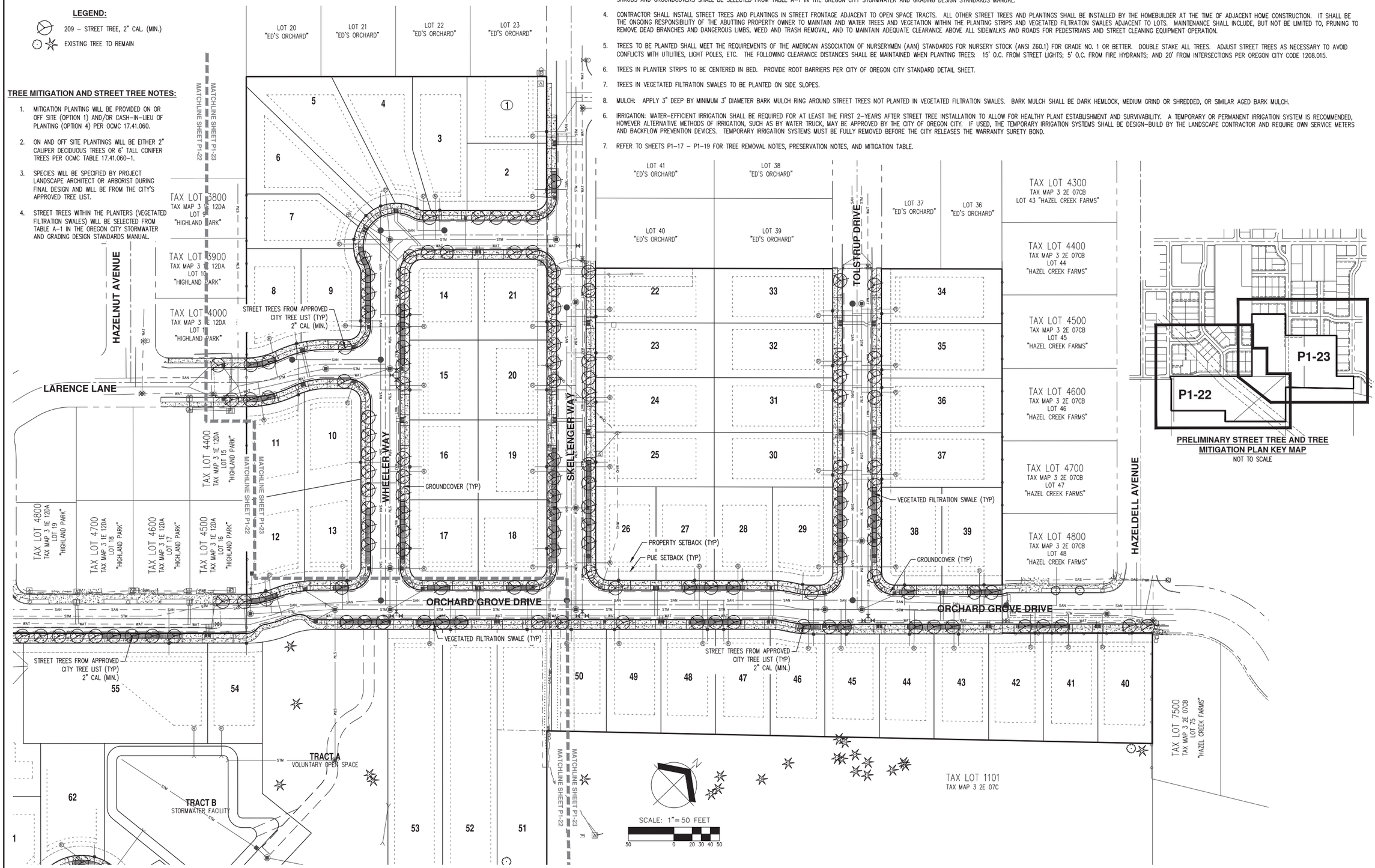

PRELIMINARY STREET TREE AND TREE MITIGATION PLAN KEY MAP
NOT TO SCALE

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OREGON CITY, OREGON
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790
CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

PRELIMINARY STREET TREE AND TREE MITIGATION PLAN

DESIGNED BY:	NKP
DRAWN BY:	NKP
CHECKED BY:	KAH
SCALE:	AS NOTED
DATE: 06/20/2017	

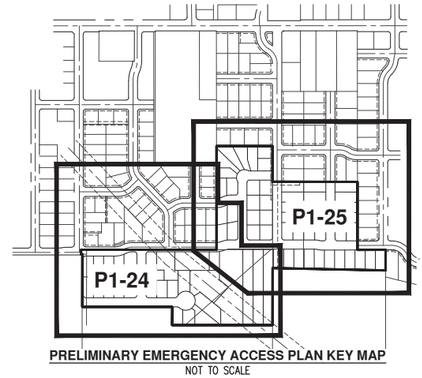
REGISTERED LANDSCAPE ARCHITECT
OREGON
KIRSTEN A. HANSWALD
PRELIMINARY NOT FOR CONSTRUCTION
06/06/13

REVISIONS

JOB NUMBER 5621

SHEET P1-23

AKS DRAWING FILE: 5621 LANDSCAPE.DWG | LAYOUT: P1-23



PRELIMINARY EMERGENCY ACCESS PLAN KEY MAP
NOT TO SCALE

* FUTURE HOME ON LOT WILL REQUIRE FIRE SUPPRESSION SPRINKLERS.

SCALE: 1"= 50 FEET
50 0 20 30 40 50

WHITE LANE

BLANCHET DRIVE

HAZELNUT AVENUE

LARENCE LANE

TAX LOT 5700
TAX MAP 31E12DA
LOT 28, "HIGHLAND PARK"

TAX LOT 5800
TAX MAP 31E12DA
LOT 29, "HIGHLAND PARK"

TAX LOT 5900
TAX MAP 31E12DA
LOT 30, "HIGHLAND PARK"

TAX LOT 6000
TAX MAP 31E12DA
LOT 31, "HIGHLAND PARK"

TAX LOT 6100
TAX MAP 31E12DA
LOT 32, "HIGHLAND PARK"

TAX LOT 4900
TAX MAP 31E12DA
LOT 20, "HIGHLAND PARK"

TAX LOT 4800
TAX MAP 31E12DA
LOT 19, "HIGHLAND PARK"

TAX LOT 4700
TAX MAP 31E12DA
LOT 18, "HIGHLAND PARK"

TAX LOT 4600
TAX MAP 31E12DA
LOT 17, "HIGHLAND PARK"

TAX LOT 4500
TAX MAP 31E12DA
LOT 16, "HIGHLAND PARK"

TAX LOT 4400
TAX MAP 31E12DA
LOT 15, "HIGHLAND PARK"

EXISTING FIRE HYDRANT (TYP)

11

12

ORCHARD GROVE DRIVE

WHITE LANE

TAX LOT 191
TAX MAP 31E13

72 73 74 75 76

77

WINNIE WAY

DISTANCE FROM ACCESS DRIVE (TYP)

125

71* 70* 69 68 67

100'

100'

TYPICAL 44'x50' BUILDING

50'

50'

150.00'

WHEELER FARM ROAD

57 56 55 54

58

BUILDING SETBACKS (TYP)

59 60 61 62

FIRE HYDRANT (TYP)

TRACT A
OPEN SPACE

TRACT B
STORMWATER FACILITY

53 52 51

63

66 65 64

REMAINDER OF
TAX LOT 1790
TAX MAP 3 1E 12D
DOC. NO. 2013-070117

TAX LOT 120
TAX MAP 32E07C

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD STE 100
TUALATIN, OR 97062
P: 503.563.6151
F: 503.563.6152
aks-eng.com

AKS
ENGINEERING - SURVEYING - NATURAL RESOURCES
FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE

WHEELER FARMS

OREGON

OREGON CITY
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

PRELIMINARY EMERGENCY ACCESS PLAN

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED

DATE: 06/20/2017

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 9, 2002
MONTGOMERY B. HURLEY
RENEWAL DATE: 6/30/19

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER
5621

SHEET
P1-24

AKS DRAWING FILE: 5621 FIRE.DWG | LAYOUT: P1-24

RENEE WAY

LOT 20 "ED'S ORCHARD"
LOT 21 "ED'S ORCHARD"
LOT 22 "ED'S ORCHARD"
LOT 23 "ED'S ORCHARD"

EXISTING FIRE HYDRANT (TYP)

HAZEL CREEK DRIVE

TAX LOT 1500
TAX MAP 31E12D

5 4 3 1
6 2
7

TAX LOT 3800
TAX MAP 31E12DA
LOT 9, "HIGHLAND PARK"

TAX LOT 3900
TAX MAP 31E12DA
LOT 10, "HIGHLAND PARK"

TAX LOT 4000
TAX MAP 31E12DA
LOT 11, "HIGHLAND PARK"

HAZELNUT AVENUE

8 9
14 21
15 20
16 19
17 18

WHEELER WAY

SKELLENGER WAY

LOT 41 "ED'S ORCHARD"
LOT 38 "ED'S ORCHARD"
LOT 40 "ED'S ORCHARD"
LOT 39 "ED'S ORCHARD"

TOLSTRUP DRIVE

22 33
23 32
24 31
25 30
26 27 28 29

BUILDING SETBACKS (TYP)

FIRE HYDRANT (TYP)

LOT 37 "ED'S ORCHARD"
LOT 36 "ED'S ORCHARD"

34
35
36
37
38 39

TAX LOT 4300
TAX MAP 32E07CB
LOT 43, "HAZEL CREEK FARMS"

TAX LOT 4400
TAX MAP 32E07CB
LOT 44, "HAZEL CREEK FARMS"

TAX LOT 4500
TAX MAP 32E07CB
LOT 45, "HAZEL CREEK FARMS"

TAX LOT 4600
TAX MAP 32E07CB
LOT 46, "HAZEL CREEK FARMS"

TAX LOT 4700
TAX MAP 32E07CB
LOT 47, "HAZEL CREEK FARMS"

TAX LOT 4800
TAX MAP 32E07CB
LOT 48, "HAZEL CREEK FARMS"

HAZELDELL AVENUE

LARENCE LANE

11 10
12 13

TAX LOT 4400
TAX MAP 31E12DA
LOT 15, "HIGHLAND PARK"

TAX LOT 4500
TAX MAP 31E12DA
LOT 16, "HIGHLAND PARK"

TAX LOT 4600
TAX MAP 31E12DA
LOT 17, "HIGHLAND PARK"

TAX LOT 4700
TAX MAP 31E12DA
LOT 18, "HIGHLAND PARK"

TAX LOT 4800
TAX MAP 31E12DA
LOT 19, "HIGHLAND PARK"

ORCHARD GROVE DRIVE

55 54
53 52 51
50 49 48 47 46 45 44 43 42 41 40

TRACT A
OPEN SPACE

TRACT B
STORMWATER FACILITY

TAX LOT 1101
TAX MAP 32E07C

TAX LOT 7500
TAX MAP 32E07CB
LOT 75, "HAZEL CREEK FARMS"

P1-25
P1-24

PRELIMINARY EMERGENCY ACCESS PLAN KEY MAP
NOT TO SCALE

SCALE: 1"=50 FEET
50 0 20 30 40 50

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FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

WHEELER FARMS

OREGON CITY
TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

OREGON
CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

PRELIMINARY EMERGENCY ACCESS PLAN

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE:	06/20/2017

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 9, 2007
MONTGOMERY B. HURLEY
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER
5621

SHEET
P1-25

AKS DRAWING FILE: 5621 FIRE.DWG | LAYOUT: P1-25

Exhibit B: Clackamas County Assessor's Map

This map was prepared for assessment purpose only.

SW 1/4 SEC. 7 T.3S. R.2E. W.M.
CLACKAMAS COUNTY
1" = 200'

D.L.C.
JOHN HOWLAND NO. 45
S.S. WHITE NO. 41 & 42

3 2E 7C

Subject Properties

Subject Property

62-64
62-88
62-84
62-02
62-31
62-03
62-14
62-33

F.U.-10

P.P. 1999-140

PARCEL 2

TBR

Sely Line of S.S. White DLC No. 45
N Wly. Line of John Howland DLC No. 45

WLY COR. JOHN HOWLAND DLC NO. 45

PGE McLOUGHLIN to St MARYS SUB.
SEE PGE DWG No. CB 518-23

See BPA DWG No. 125107

EASEMENT

SEE MAP 3 2E 18

SEE MAP 3 2E 7BD

SEE MAP 3 2E 7B

SEE MAP 3 2E 7D

BOOK 29
3 2E 7C

This map was prepared for assessment purpose only.

SE 1/4 SEC. 12 T.3S. R. 1E. W.M.
CLACKAMAS COUNTY
1"=200'

DLC.
M. M. Mc CARVER NO. 41
S. S. WHITE NO. 42

3 1E 12D

SALMONBERRY DR.
SKELLENGER DRIVE
HAZELNUT CT.
GROVE
HAZEL DR.
HAZELNUT
VINCENT WAY
GERANIUM DRIV
WESTWOOD DR.
KOLAR DRIV
DAHLIA TERRACE
DERRINGER DRIVE
MAP PLACE
12DB LOOP (PVT.)
HUMMINGBIRD AVENUE (PVT.)
PARRISH RD.
POND
PAYSON
RENEE WAY
LANE
PUBLIC ROADWAY
CENTRAL PT RD.
WHITE LANE
M K T
P.G.E. McLOUGHLIN to St MARYS SUB
SEE P.G.E. DWG. No. CB 518-22
S'ELY LINE M. M. McCARVER D.L.C. NO. 41
1/4 COR.
B. P. A. EASEMENT
SEE MAP 3 1E 12A
SEE MAP 3 1E 12B
SEE MAP 3 1E 12C
SEE MAP 3 1E 12DD
SEE MAP 3 1E 13
SEE MAP 3 2E 7C
SEE MAP 62-02
SEE MAP 3 1E 12DA
SEE MAP 3 1E 13
11500
11800
12000
19500
20000
PARCEL 1
PARCEL 2
PARCEL 3
PP 1998 -108
703 0.50 Ac. 11819
704 0.50 Ac. 11819
705 0.27 Ac. 11819
62-64 3 1E
62-84
62-14
62-88
62-64
62-02
62-03
62-33
62-64
12DC
12DB
100 1.00 Ac. 19531
1500 5.61 Ac.
1501 0.93 Ac. 19624
1505 1.00 Ac. 19706
1700 4.62 Ac.
1701 5.13 Ac. 19584
1790 8.48 Ac.
TBR
AG/F
CANCELLED
1594 300
1504 301
200 302
700 303
702 304
1490 305
800 306
900 400
901 401
1000 402
1100 500
1200 600
1300 1502
1400 1506
1401 1503
1402 1593
1600
Subject Properties
3 1E 12D
BOOK 27

Exhibit C: City Land Use Application Forms and Checklist

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
☐ Site Plan and Design Review	☐ 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

File Number(s): PA 16-54 (Pre-Application Conference)

Proposed Land Use or Activity: A new subdivision for future construction of single-family detached residential homes.

Project Name: Wheeler Farms **Number of Lots Proposed (If Applicable):** 77

Physical Address of Site: 19566 S Central Point Road

Clackamas County Map and Tax Lot Number(s): Map: 32E07C Tax Lots: 1001, 1100, 1180, & 1291
Map: 31E12D Tax Lots: 1700 & 1790

Applicant(s):

Applicant(s) Signature:

Applicant(s) Name Printed: Rian Park Development, Inc. **Date:**

Mailing Address: P.O. Box 2559, Oregon City, OR 97045

Phone: Contact Applicant's Consultant **Fax:** Contact Applicant's Consultant **Email:** Contact Applicant's Consultant

Property Owner(s):

Property Owner(s) Signature: David H. Wheeler Jr.

Property Owner(s) Name Printed: Wheeler Family Enterprises, LLC (Tax Lots:1001, 1700, 1790) **Date:** 6/15/17

Mailing Address:

Phone: Contact Applicant's Consultant **Fax:** Contact Applicant's Consultant **Email:** Contact Applicant's Consultant

Representative(s):

Representative(s) Signature: Monty B Hurley

Representative (s) Name Printed: AKS Engineering & Forestry, LLC (Monty Hurley) **Date:** 6/15/17

Mailing Address: 12965 SW Herman Road, Suite 100, Tualatin, OR 97062

Phone: 503-563-6151 **Fax:** 503-563-6152 **Email:** monty@aks-eng.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.

OREGON CITY

Community Development – Planning

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Applicant(s) Signature:

Applicant(s) Name Printed: Rian Park Development, Inc. **Date:**

Mailing Address: P.O. Box 2559, Oregon City, OR 97045

Phone: Contact Applicant's Consultant **Fax:** Contact Applicant's Consultant **Email:** Contact Applicant's Consultant

Property Owner(s):

Property Owner(s) Signature: David H. Wheeler Jr.

Property Owner(s) Name Printed: David H. Wheeler Sr. Trust (Tax Lots:1100, 1180) **Date:** 6/15/17

Mailing Address:

Phone: Contact Applicant's Consultant **Fax:** Contact Applicant's Consultant **Email:** Contact Applicant's Consultant

Representative(s):

Representative(s) Signature: Monty B Hurley

Representative (s) Name Printed: AKS Engineering & Forestry, LLC (Monty Hurley) **Date:** 6/15/17

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Applicant(s):

Applicant(s) Signature:

Applicant(s) Name Printed: Rian Park Development, Inc. **Date:**

Mailing Address: P.O. Box 2559, Oregon City, OR 97045

Phone: Contact Applicant's Consultant **Fax:** Contact Applicant's Consultant **Email:** Contact Applicant's Consultant

Property Owner(s):

Property Owner(s) Signature: Donald W. Wheeler

Property Owner(s) Name Printed: Donald W. Wheeler and Roxanne O. Wheeler (Tax Lot:1291) **Date:** 6/15/17

Mailing Address: 19898 S White Lane, Oregon City, OR 97045

Phone: Contact Applicant's Consultant **Fax:** Contact Applicant's Consultant **Email:**

Representative(s):

Representative(s) Signature: Monty B Hurley

Representative (s) Name Printed: AKS Engineering & Forestry, LLC (Monty Hurley) **Date:** 6/15/17

Mailing Address: 12965 SW Herman Road, Suite 100, Tualatin, OR 97062

Phone: 503-563-6151 **Fax:** 503-563-6152 **Email:** monty@aks-eng.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.

OREGON CITY

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Applicant(s) Signature:

Applicant(s) Name Printed: Rlan Park Development, Inc. Date: 6/13/17

Mailing Address: P.O. Box 2559, Oregon City, OR 97045

Phone: Contact Applicant's Consultant Fax: Contact Applicant's Consultant Email: Contact Applicant's Consultant

Property Owner(s):

Property Owner(s) Signature:

Property Owner(s) Name Printed: Date:

Mailing Address:

Phone: Fax: Email:

Representative(s):

Representative(s) Signature: Monty B Hurley

Representative (s) Name Printed: AKS Engineering & Forestry, LLC (Monty Hurley) Date: May 22, 2017

Mailing Address: 12965 SW Herman Road, Suite 100, Tualatin, OR 97062

Phone: 503-563-6151 Fax: 503-563-6152 Email: monty@aks-eng.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.

OREGON CITY

Community Development – Planning

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

Subdivision Checklist

1. ☑ **Signed Land Use 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 describing:
   - ☑ The proposed development that describes existing site conditions, existing buildings, public facilities and services, presence of wetlands, steep slopes and other natural features
   - ☑ A detailed description of the proposed development, including a description of any phasing (including the time, acreage, number of residential units, amount of area for nonresidential use, open space, and development of utilities and public facilities for each phase), proposed uses, number and type of residential units, allocation and ownership of all lots, tracts, streets, and public improvements and the structure of any homeowner's association.
   - ☑ Timely Provision of Public Services and Facilities. The applicant shall explain in detail how and when each of the following public services or facilities is, or will be, adequate to serve the proposed development by the time construction begins:
     - ☑ Water
     - ☑ Sanitary sewer
     - ☑ Storm sewer and stormwater drainage
     - ☑ Parks and recreation
     - ☑ Traffic and transportation
     - ☑ Schools
     - ☑ Fire and police services

     Where adequate capacity for any of these public facilities and services is not demonstrated to be currently available, the applicant shall describe how adequate capacity in these services and facilities will be financed and constructed before recording of the plat
   - ☑ Overall density of the subdivision and the density by dwelling type for each

4. ☑ **Review Criteria**
A response addressing each section of Chapters 16.08, 16.12, 12.04, 12.08, 13.12, and any other applicable chapter identified in the Oregon City Municipal Code.

5. ☑ **Site Plan**
A detailed site development plan showing:
   - ☑ The location and dimensions of lots, streets, pedestrian ways, transit stops, common areas, building envelopes and setbacks
   - ☑ All existing and proposed utilities and improvements including sanitary sewer, stormwater and water facilities
   - ☑ Total impervious surface created (including streets, sidewalks, etc.)
   - ☑ An indication of existing and proposed land uses for the site

6. ☑ **A Subdivision Connectivity Analysis**
Prepared by a transportation engineer, licensed by the State of Oregon, that describes the existing and future vehicular; bicycle and pedestrian connections between the proposed subdivision and existing or

planned land uses on adjacent properties. The subdivision connectivity analysis shall include shadow plats of adjacent properties demonstrating how lot and street patterns within the proposed subdivision will extend to and/or from such adjacent properties and can be developed meeting the existing Oregon City Municipal Code design standards.

7. ✓ **Traffic/Transportation Plan**

The applicant's traffic/transportation information shall include two elements:

- ☑ A detailed site circulation plan showing proposed vehicular, bicycle, transit and pedestrian access points and connections to the existing system, circulation patterns and connectivity to existing rights-of-way or adjacent tracts, parking and loading areas and any other transportation facilities in relation to the features illustrated on the site plan.
- ☑ A traffic impact study prepared by a qualified professional transportation engineer, licensed in the state of Oregon, that assesses the traffic impacts of the proposed development on the existing transportation system and analyzes the adequacy of the proposed internal transportation network to handle the anticipated traffic and the adequacy of the existing system to accommodate the traffic from the proposed development. The city engineer may waive any of the foregoing requirements if the city engineer determines that the requirement is unnecessary in the particular case.

8. ✓ **Natural Features Plan, Topography and Preliminary Grading and Drainage Plan**

The applicant shall submit a map illustrating all of the natural features and hazards on the subject property and, where practicable, within two hundred fifty feet of the property's boundary. The map shall also illustrate the approximate grade of the site before and after development. Illustrated features must include all proposed streets and cul-de-sacs, the location and estimated volume of all cuts and fills, and all stormwater management features. This plan shall identify the location of drainage patterns and courses on the site and within two hundred fifty feet of the property boundaries where practicable. Features that must be illustrated shall include the following:

- ☑ Proposed and existing street rights-of-way and all other transportation facilities
- ☑ All proposed lots and tracts
- ☑ All trees with a diameter six inches or greater measured four feet from the ground
- N/A☐ All water quality resource areas pursuant to Chapter 17.49, including all jurisdictional wetlands shown in a delineation according to the Corps of Engineers Wetlands Delineation Manual, January, 1987 edition, and approved by the Division of State Lands and wetlands identified in the City of Oregon Local Wetlands inventory, adopted by reference in the City of Oregon City comprehensive plan
- ☑ All known geologic and flood hazards, landslides or faults, areas with a water table within one foot of the surface and all flood management areas pursuant to Chapter 17.42
- N/A☐ The location of any known state or federal threatened or endangered species
- ☑ All historic areas or cultural features acknowledged as such on any federal, state or city inventory
- N/A☐ All wildlife habitat or other natural features listed on any of the city's official inventories

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

The principal planner may require additional information to ensure that the proposed development does not adversely affect the surrounding community, identified natural resource areas or create hazardous conditions for persons or improvements on the site.

- ☑ Geologic Hazards. For property subject to Chapter 17.44, the applicant shall submit a report prepared by a qualified professional engineer, certified in geology or geotechnical engineering, describing how construction of the proposed subdivision is feasible and meets the applicable requirements of Chapter 17.44.
- ☑ Water Resources. For property subject to Chapter 17.49, the applicant shall submit a report prepared by a qualified professional describing the location and quality of any water quality

resource area subject to regulation under Chapter 17.49. This report shall also explain how the proposed subdivision is feasible and meets the applicable requirements of Chapter 17.49.

10. ☑ **Tree Removal and Mitigation Plan** *(In Accordance with OCMC Chapter 17.41)*

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

12. ☑ **Summary of the Meeting with the Applicable Neighborhood Association**

13. ☑ **Preliminary Storm Calculations** *(If Water Quality Detention is Required)*

14. ☑ **Erosion and Sediment Control Permit**
The applicant shall submit an application for an erosion and sediment control permit pursuant to Chapter 17.47 concurrently with the preliminary subdivision plat application, including the measures that will be implemented throughout construction of the subdivision to control erosion and sedimentation, unless waived by the city engineer. This plan must be consistent with all applicable erosion control requirements in Chapter 17.47.

15. ☑ **CC & R's**
Drafts of the proposed covenants, conditions and restrictions (CC&Rs), maintenance agreements, homeowner association agreements, dedications, deeds easements, or reservations of public open spaces not dedicated to the city, and related documents for the subdivision.

16. ☑ **A Current Preliminary Title Report for the Subject Property(ies)**

17. ☑ **Mailing Labels for Owners Within 300 Feet of the Subject Site or $15 for City-provided labels**
The names and addresses of property owners within 300 feet of the site indicated on the most recent property tax rolls.

18. ☑ **Copies**
Two (2) copies of all information, reports, and drawings (full-sized and 8.5" by 11") pertaining to this application.

19. ☑ **Electronic Version of All Application Materials**

20. ☑ **All Required Application Fees**

Incomplete Applications will not be processed

Exhibit D: Property Ownership Information

Fidelity National Title
OREGON

Property Profile Report

Address Not Available

Ownership Information

Owner Name:	Please see attached vesting deed for current ownership.
Mailing Address:	19566 CENTRAL POINT RD OREGON CITY, OR 97045

Property Description

County:	Clackamas	Map / Tax Lot:	32E07C/01001
Account Num:	00862748	Owner Occ.:	No
Land Use:	540-	Census:	
Map Grid:	717-B5		
Subdivision:			
Legal Description:	Section 07 Township 3S Range 2E Quarter C TAX LOT 01001		

Property Characteristics

Property Type:	AGRICULTURAL	Building SF:		Pool:	No
House Style:		Living Area SF:		Deck SF:	
Year Built:		Square Feet:	0	Deck Desc:	
Bedrooms:		1st Floor SF:		Patio SF:	
Bathrooms:		2nd Floor SF:		Patio Desc:	
Heat:		3rd Floor SF:		Foundation:	
Cooling:		Attic SF:		Exterior:	
Lot Size:	188,065	Bsmnt SF:		Ext. Finish:	
Acres:	4.21	Fin Bsmt SF:		Interior:	
Garage Type:		Garage SF:		Roof Style:	
Fireplaces:		Bsmnt Type:		Roof Cover:	

Assessment Information

Real Market Value:	$ 557,432	Land Value:	$ 557,432	Imp. Value:	$ 0
Total Assessed Value:	$ 3,406	Levy Code:	062064	M-5 Rate:	.0182
Taxes:	$ 61.88	Tax Year:	15-16		

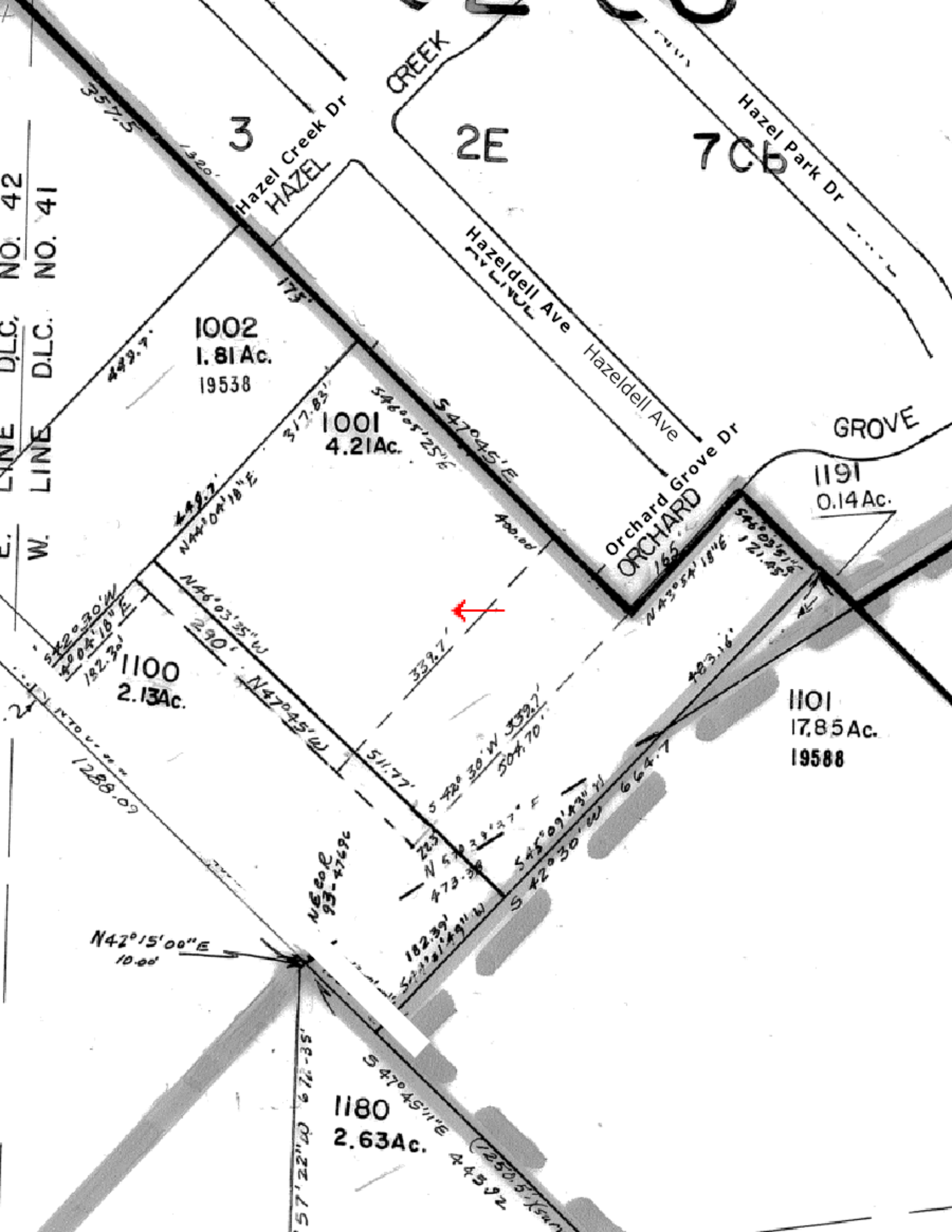
Previous Sale Information

Sale Amount:	Sale Date:	Document Num:

Transaction History

Sale Date	Sale Amount	HPI Sale Amount	Document Type	Reception Num	Book/Page
3/8/2013	$ 0		S	2013-016299	/
5/21/2007	$ 1		S	2007-043768	/

All information provided by ValueCheck, Inc is deemed reliable, but not guaranteed.
Accuracy of the information may vary by county.


CREEK
3
2E
7Cb
Hazel Creek Dr
HAZEL
Hazel Park Dr
Hazeldell Ave
Hazeldell Ave
Orchard Grove Dr
ORCHARD
GROVE
NO. 42
NO. 41
D.L.C.
D.L.C.
LINE
LINE
W.
1002
1.81 Ac.
19538
1001
4.21Ac.
1191
0.14 Ac.
1100
2.13Ac.
1101
17.85 Ac.
19588
1180
2.63Ac.
357.5'
1320'
449.7'
317.83'
S46°05'25"E
S47°45'E
449.2'
N44°04'18"E
400.00'
165'
N43°54'18"E
S46°03'51"E
121.45'
S42°30'W
182.39'
N46°03'35"W
290'
N47°45'W
511.77'
339.2'
S42°30'W 339.2'
504.70'
483.16'
S45°09'43"W
664.1'
S42°30'W
1258.09'
N42°15'00"E
10.00'
S47°45'11"E
(1250.51' Survey)
44.92'
S57°22'00"W
67.35'

STATUTORY BARGAIN AND SALE DEED

Wheeler Family Investment Limited Partnership
19566 S Central Point Rd.
Oregon City, OR 97045

GRANTORS

TO
Wheeler Family Enterprises, LLC
19566 S Central Point Rd.
Oregon City, OR 97045 **GRANTEE**

After recording, return to:
Jaylin Palacio
Tyler Smith
Tyler Smith & Associates P.C.
181 N Grant St. STE 212
Canby, OR 97013

Clackamas County Official Records
Sherry Hall, County Clerk **2013-016299**

01662995201300162990030032 **$58.00**

03/08/2013 1:39:52 PM

D-D Cnt=1 Stn=2 TINAJAR
$15.00 $10.00 $16.00 $17.00

Until a change is requested, all tax statements shall be sent to:
Wheeler Family Enterprises, LLC
19566 S Central Point Rd.
Oregon City, OR 97045

STATUTORY BARGAIN AND SALE DEED

The Wheeler Family Investment Limited Partnership, **GRANTOR**, hereby conveys to Wheeler Family Enterprises, LLC, as **GRANTEE**, the following described real property:

Tract 1 being fully described in the attached Exhibit A.

No monetary consideration for this conveyance exchange was all or part of the consideration.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009

Dated: March 8, 2013, 2013. David H. Wheeler, Sr.

David H. Wheeler Sr., General Partner, The Wheeler Family Investments Limited Partnership

STATE OF OREGON,)
County of Clackamas) ss.
This instrument was signed or acknowledged before me on March 8, 2013.

By:

OFFICIAL SEAL
JAYLIN D PALACIO
NOTARY PUBLIC - OREGON
COMMISSION NO. 458146
MY COMMISSION EXPIRES MAY 02, 2015

Jaylin D. Palacio

Notary Public for State of Oregon
My commission expires: May 2, 2015

Delivered to and accepted by:

David H. Wheeler Sr.

David H. Wheeler Sr., Member, Wheeler Family Enterprises, LLC.

ENGINEERING PLANNING
FORESTRY
13910 S.W. Galbreath Dr., Suite 100
Sherwood, Oregon 97140
Phone: (503) 925-8799
Fax: (503) 925-8969

AKS JOB No. 2142

LANDSCAPE ARCHITECTURE
SURVEYING
AKS Group of Companies:
SHERWOOD, OREGON
SALEM, OREGON
VANCOUVER, WASHINGTON
www.aks-eng.com

EXHIBIT A

Tract 1
City of Oregon City Planning File No. LL 12-01

A tract of land located in the Southwest One-Quarter of Section 7, Township 3 South, Range 2 East, Willamette Meridian, City of Oregon City, Clackamas County, Oregon, being more particularly described as follows:

Commencing at a 5/8 inch iron rod with a red plastic cap inscribed "AKS ENGR." at the southerly corner of Lot 75 of the plat "Hazel Creek Farms"; thence along the southwest line of said Lot 75, North 46°03'51" West 38.92 feet to a 5/8 inch iron rod with a yellow plastic cap inscribed "AKS ENGR." and the Point of Beginning; thence along the northwest line of that tract of land conveyed to David H. Wheeler Jr. and Carol A. Wheeler in Document Number 2004-103478 and clarified in Boundary Line Agreement Document Number 2012-039420, Clackamas County Deed Records, South 45°09'43" West 483.16 feet to a set 5/8 inch iron rod with a yellow plastic cap inscribed "AKS ENGR."; thence leaving said northwest line, North 46°03'35" West 511.77 feet to a set 5/8 inch iron rod with a yellow plastic cap inscribed "AKS ENGR." on the southeast line of that tract of land conveyed to David H. Wheeler, Sr. Trustee of the David H. Wheeler Sr. Trust per Document Number 2002-068860, Clackamas County Deed Records; thence along said southeast line, North 44°04'18" East 317.83 feet to a 5/8 inch iron rod with a yellow plastic cap inscribed "AKS ENGR." on the southwest line of Lot 44 of the plat "Hazel Creek Farms"; thence along the westerly southwest line of "Hazel Creek Farms", South 46°05'25" East 400.00 feet to a 12 inch by 18 inch stone with a "X" scribed on top on the southeast right-of-way line of Orchard Grove Drive (26.00 feet from centerline); thence along said southeast right-of-way line, North 43°54'18" East 165.00 feet to the westerly corner of said Lot 75; thence along the westerly line of said Lot 75, South 46°03'51" East 121.45 feet to the Point of Beginning.

The above described tract of land contains 4.21 acres, more or less.

06-25-12
REGISTERED
PROFESSIONAL
LAND SURVEYOR
OREGON
JANUARY 11, 2005
ROBERT D. RETTIG
60124LS
RENEWS: 12/31/12

Fidelity National Title
OREGON

Property Profile Report

Address Not Available

Ownership Information

Owner Name:	Please see attached vesting deed for current ownership.
Mailing Address:	19566 CENTRAL POINT RD OREGON CITY, OR 97045

Property Description

County:	Clackamas	Map / Tax Lot:	32E07C/01100
Account Num:	00862828	Owner Occ.:	No
Land Use:	541-	Census:	
Map Grid:	717-B5		
Subdivision:			

Legal Description: Township 3S Range 2E Section 07 Quarter C TAX LOT 01100 SEE SPLIT CODE ACCT 01180

Property Characteristics

Property Type:	SINGLE FAMILY	Building SF:	1,712	Pool:	No
House Style:		Living Area SF:	1,712	Deck SF:	
Year Built:	1926	Square Feet:	1,712	Deck Desc:	
Bedrooms:	5	1st Floor SF:		Patio SF:	
Bathrooms:	1.50	2nd Floor SF:		Patio Desc:	
Heat:		3rd Floor SF:		Foundation:	
Cooling:		Attic SF:		Exterior:	
Lot Size:	96,907	Bsmnt SF:		Ext. Finish:	
Acres:	2.13	Fin Bsmt SF:		Interior:	
Garage Type:		Garage SF:		Roof Style:	
Fireplaces:		Bsmnt Type:		Roof Cover:	

Assessment Information

Real Market Value:	$ 271,977	Land Value:	$ 179,617	Imp. Value:	$ 92,360
Total Assessed Value:	$ 132,652	Levy Code:	062064	M-5 Rate:	.0182
Taxes:	$ 2,409.93	Tax Year:	15-16		

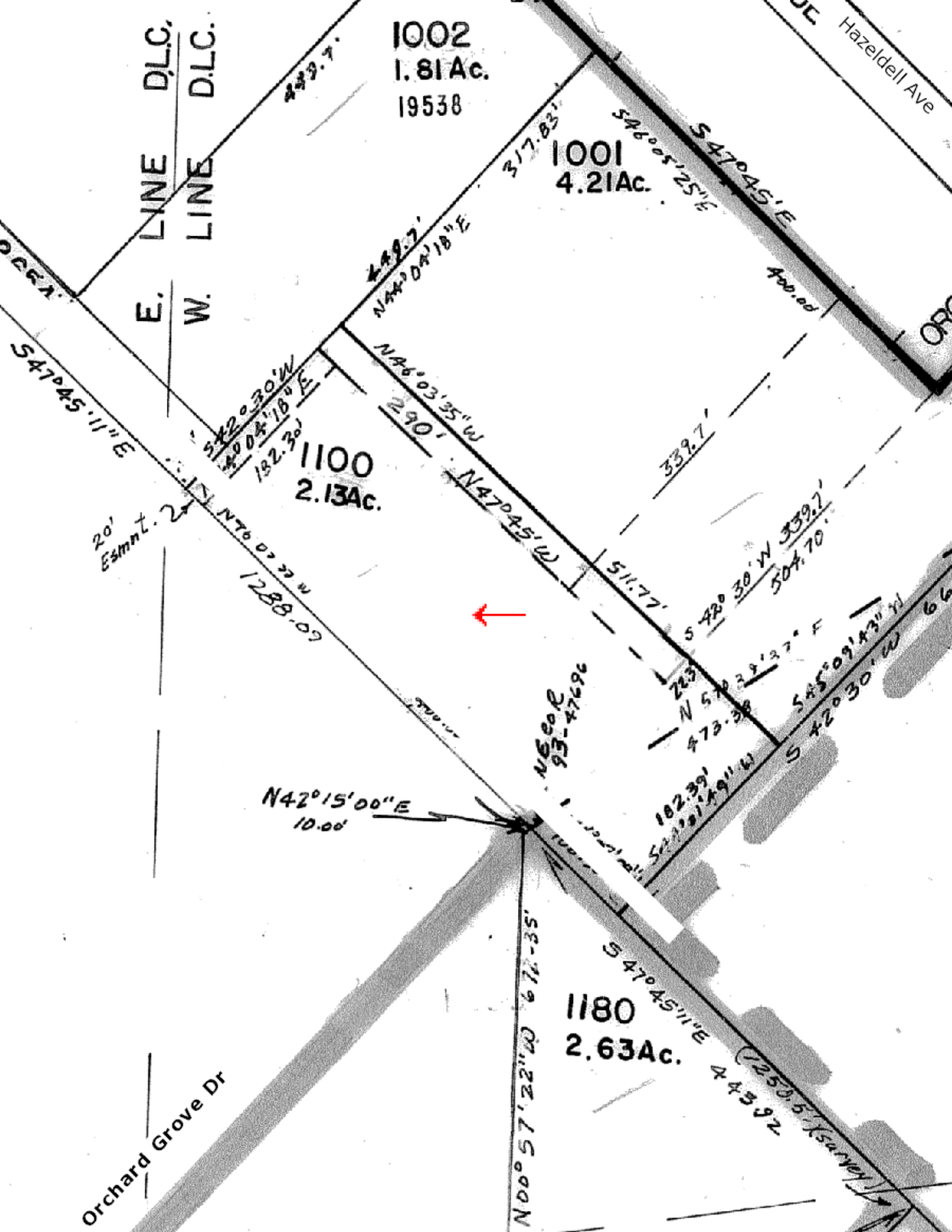
Previous Sale Information

Sale Amount:	Sale Date:	Document Num:

Transaction History

Sale Date	Sale Amount	HPI Sale Amount	Document Type	Reception Num	Book/Page
5/21/2007	$ 0	$ 0	X	2007-043769	/
11/9/2004	$ 1	$ 0	X	2004-103476	/

All information provided by ValueCheck, Inc is deemed reliable, but not guaranteed.
Accuracy of the information may vary by county.


1002
1.81 Ac.
19538
1001
4.21Ac.
1100
2.13Ac.
1180
2.63Ac.
E. LINE D.L.C.
W. LINE D.L.C.
449.7'
317.83'
S48°05'25"E
S47°45'E
400.00
N44°04'18"E
449.7'
S42°30'W
N44°04'18"E
132.30'
N46°03'35"W
290'
N47°45'W
511.77'
339.7'
S42°30'W
339.7'
504.70'
S47°45'11"E
20' Esmnt. 2
N70°07'22"W
1288.09
N42°15'00"E
10.00'
NE cor 93-47696
S45°09'43"W
182.39'
S42°30'W
N00°57'22"W 671.35'
S47°45'11"E
1250.57' (survey)
443.92
Orchard Grove Dr
Hazeldell Ave

3P

STATUTORY QUIT CLAIM DEED

David H. Wheeler Jr.
19588 S Central Point Rd.
Oregon City, OR 97045

GRANTOR

TO
David H. Wheeler Sr. as Trustee
David H. Wheeler Sr. Trust
19566 S Central Point Rd.
Oregon City, OR 97045

GRANTEE

After recording, return to:

Jaylin Palacio
Tyler Smith & Associates P.C.
181 N Grant St. STE 212
Canby, OR 97013
Anna Adams

Clackamas County Official Records
Sherry Hall, County Clerk

2013-007511

$58.00

01653157201300075110030034

02/01/2013 10:15:48 AM

D-D Cnt=1 Stn=1 JANISKEL
$15.00 $10.00 $16.00 $17.00

Until a change is requested, all tax statements shall be sent to:
The David H. Wheeler Sr. Trust
19566 S Central Point Rd.
Oregon City, OR 97045

STATUTORY QUITCLAIM DEED

David H. Wheeler Jr., **GRANTOR**, hereby releases and quitclaim to the David H. Wheeler Sr. as Trustee of the David H. Wheeler Sr. Trust, as **GRANTEE**, all right, title, and interest in and to the Property described as:

All real property, if any, BETWEEN: the northwestern boundary of the lot conveyed to David H Wheeler Jr. and Carol Wheeler, with the established legal description in the recorded Document Number 2004-103478, and furthermore with a legal description of said Boundary Line being described in the Boundary Line Agreement recorded in the real property records of Clackamas County as document number 2012-039420;
AND
the southeastern boundary line of the adjacent lot to the northwest, with said adjacent lot (also known as Tract 2) being recorded as Clackamas County record number 2004-103477 as amended by Property Line Adjustment Oregon City Planning File 12-01and shown Survey Number SN2012-080, with said survey recorded as Clackamas County record 2012-058983. The full legal description of the entire Tract 2 is described in Attachment A.

No monetary consideration for this conveyance was all or part of the consideration.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009

Dated: January 30, 2013.

David H. Wheeler Jr.

David H. Wheeler Jr., Grantor

STATE OF OREGON, County of Clackamas) ss.
This instrument was signed or acknowledged before me on January 30, 2013.

By:

OFFICIAL SEAL
JAYLIN D PALACIO
NOTARY PUBLIC - OREGON
COMMISSION NO. 458146
MY COMMISSION EXPIRES MAY 02, 2015

Jaylin D Palacio

Notary Public for State of Oregon
My commission expires: May 2, 2015

Delivered to and accepted by:

David H. Wheeler Sr.

David H. Wheeler Sr., Trustee, the David H. Wheeler Sr. Trust

ENGINEERING PLANNING
FORESTRY
13910 S.W. Galbreath Dr., Suite 100
Sherwood, Oregon 97140
Phone: (503) 925-8799
Fax: (503) 925-8969

AKS JOB No. 2142

LANDSCAPE ARCHITECTURE
SURVEYING
AKS Group of Companies:
SHERWOOD, OREGON
SALEM, OREGON
VANCOUVER, WASHINGTON
www.aks-eng.com

EXHIBIT A

Tract 2
City of Oregon City Planning File No. LL 12-01

A tract of land located in the Southwest One-Quarter of Section 7, Township 3 South, Range 2 East, Willamette Meridian, City of Oregon City, Clackamas County, Oregon, being more particularly described as follows:

Commencing at a 5/8 inch iron rod with a red plastic cap inscribed "AKS ENGR." at the southerly corner of Lot 75 of the plat "Hazel Creek Farms"; thence along the southwest line of said Lot 75, North 46°03'51" West 38.92 feet to a 5/8 inch iron rod with a yellow plastic cap inscribed "AKS ENGR."; thence along the northwest line of that tract of land conveyed to David H. Wheeler Jr. and Carol A. Wheeler in Document Number 2004-103478 and clarified in Boundary Line Agreement Document Number 2012-039420, Clackamas County Deed Records, South 45°09'43" West 483.16 feet to a set 5/8 inch iron rod with a yellow plastic cap inscribed "AKS ENGR." and the Point of Beginning; thence South 44°01'49" West 182.39 feet to a point on the northeasterly line of that tract of land conveyed to The Wheeler Family Investment Limited Partnership, an Oregon Limited Partnership in Document Number 2007-043768, Clackamas County Deed Records; thence along said northeasterly line and the northeasterly line, North 46°02'08" West 108.30 feet to a 6 inch by 6 inch stone with a "X" at the northerly corner thereof; thence along the northeasterly line of that tract of land conveyed to Edwin M. Tolstrup and Reitha M. Tolstrup in Document Number 2001-067656, Clackamas County Deed Records, North 46°03'35" West 400.00 feet to a 5/8 inch iron rod with a yellow plastic cap inscribed "AKS ENGR." at the southerly corner of that tract of land conveyed to David H. Wheeler Sr. Trust per Document Number 2002-068860, Clackamas County Deed Records; thence along the David H. Wheeler Sr. Trust tract, North 44°04'18" East 182.30 feet to a set 5/8 inch iron rod with a yellow plastic cap inscribed "AKS ENGR."; thence South 46°03'35" East 511.77 feet to the Point of Beginning.

The above described tract of land contains 2.13 acres, more or less.

06-25-12
REGISTERED
PROFESSIONAL
LAND SURVEYOR
OREGON
JANUARY 11, 2005
ROBERT D. RETTIG
60124LS
RENEWS: 12/31/12

Fidelity National Title OREGON

Property Profile Report

Address Not Available

Ownership Information

Owner Name:	Please see attached vesting deed for current ownership.
Mailing Address:	19566 CENTRAL POINT RD OREGON CITY, OR 97045

Property Description

County:	Clackamas	Map / Tax Lot:	32E07C/01180
Account Num:	00862837	Owner Occ.:	No
Land Use:	680-	Census:	
Map Grid:	717-B5		
Subdivision:			

Legal Description: Township 3S Range 2E Section 07 Quarter C TAX LOT 01180 SEE SPLIT CODE ACCT 01100

Property Characteristics

Property Type:	OTHER	Building SF:		Pool:	No
House Style:		Living Area SF:		Deck SF:	
Year Built:		Square Feet:	0	Deck Desc:	
Bedrooms:		1st Floor SF:		Patio SF:	
Bathrooms:		2nd Floor SF:		Patio Desc:	
Heat:		3rd Floor SF:		Foundation:	
Cooling:		Attic SF:		Exterior:	
Lot Size:	140,812	Bsmnt SF:		Ext. Finish:	
Acres:	2.63	Fin Bsmt SF:		Interior:	
Garage Type:		Garage SF:		Roof Style:	
Fireplaces:		Bsmnt Type:		Roof Cover:	

Assessment Information

Real Market Value:	$ 236,355	Land Value:	$ 236,355	Imp. Value:	$ 0
Total Assessed Value:	$ 1,914	Levy Code:	062002	M-5 Rate:	.0182
Taxes:	$ 34.78	Tax Year:	15-16		

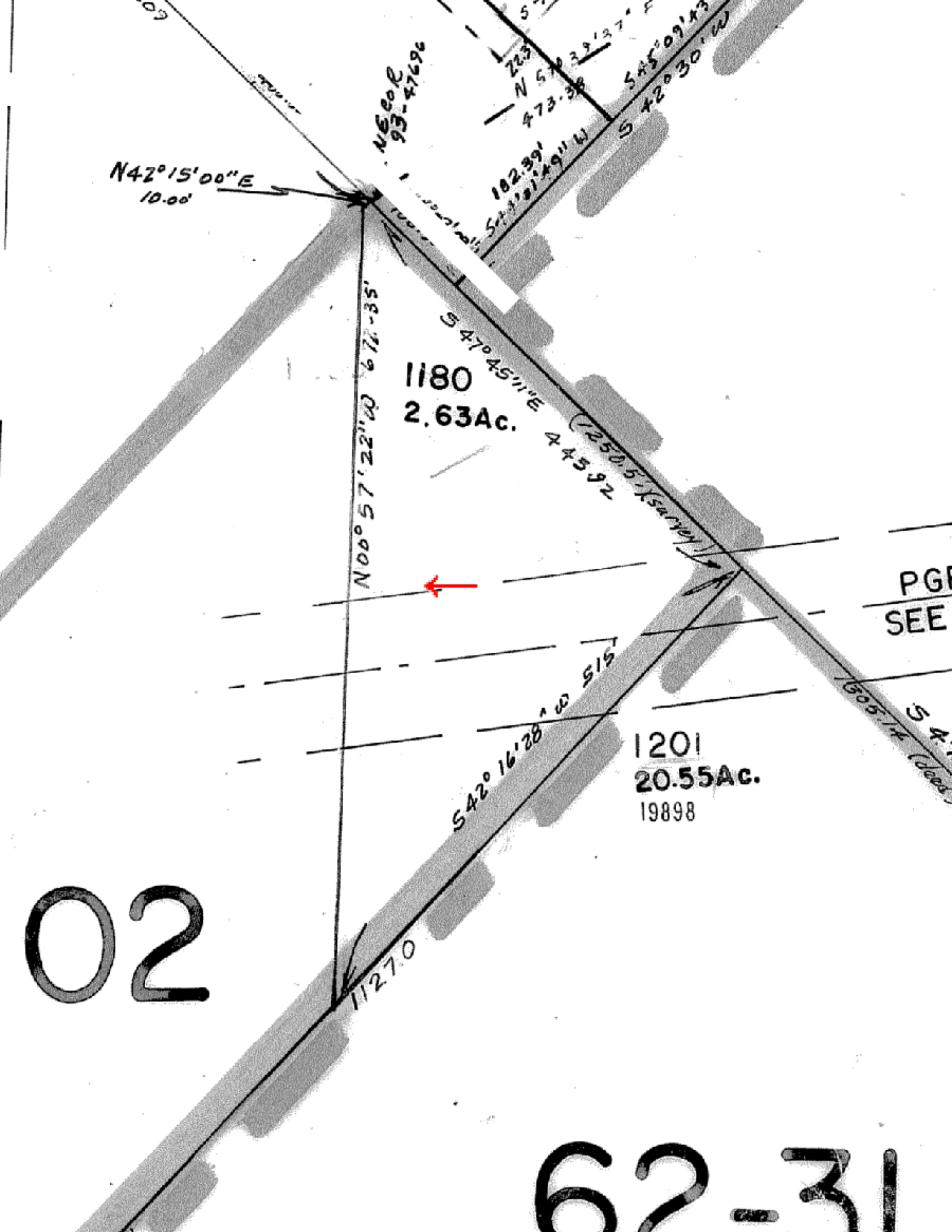
Previous Sale Information

Sale Amount:	Sale Date:	Document Num:

Transaction History

Sale Date	Sale Amount	HPI Sale Amount	Document Type	Reception Num	Book/Page
5/21/2007	$ 0		M	2007-043769	/
11/9/2004	$ 1		M	2004-103476	/

All information provided by ValueCheck, Inc is deemed reliable, but not guaranteed.
Accuracy of the information may vary by county.


N42°15'00"E
10.00'
NEcor
93-47696
N 67°32'37" E
223.
473.38
S 42°30' W
182.39'
S 47°45'11" W
1180
2.63Ac.
N 00°57'22" W 677.35'
S 47°45'11" E 445.92
(250.5' Survey)
1201
20.55Ac.
19898
S 42°16'28" W 515'
1127.0
PGE
SEE
02
62-31

3P

STATUTORY QUIT CLAIM DEED

David H. Wheeler Jr.
19588 S Central Point Rd.
Oregon City, OR 97045

GRANTOR

TO
David H. Wheeler Sr. as Trustee
David H. Wheeler Sr. Trust
19566 S Central Point Rd.
Oregon City, OR 97045

GRANTEE

After recording, return to:

Jaylin Palacio
Tyler Smith & Associates P.C.
181 N Grant St. STE 212
Canby, OR 97013
Anna Adams

Clackamas County Official Records
Sherry Hall, County Clerk

2013-007511

$58.00

01653157201300075110030034

02/01/2013 10:15:48 AM

D-D Cnt=1 Stn=1 JANISKEL
$15.00 $10.00 $16.00 $17.00

Until a change is requested, all tax statements shall be sent to:
The David H. Wheeler Sr. Trust
19566 S Central Point Rd.
Oregon City, OR 97045

STATUTORY QUITCLAIM DEED

David H. Wheeler Jr., **GRANTOR**, hereby releases and quitclaim to the David H. Wheeler Sr. as Trustee of the David H. Wheeler Sr. Trust, as **GRANTEE**, all right, title, and interest in and to the Property described as:

All real property, if any, BETWEEN: the northwestern boundary of the lot conveyed to David H Wheeler Jr. and Carol Wheeler, with the established legal description in the recorded Document Number 2004-103478, and furthermore with a legal description of said Boundary Line being described in the Boundary Line Agreement recorded in the real property records of Clackamas County as document number 2012-039420;
AND
the southeastern boundary line of the adjacent lot to the northwest, with said adjacent lot (also known as Tract 2) being recorded as Clackamas County record number 2004-103477 as amended by Property Line Adjustment Oregon City Planning File 12-01and shown Survey Number SN2012-080, with said survey recorded as Clackamas County record 2012-058983. The full legal description of the entire Tract 2 is described in Attachment A.

No monetary consideration for this conveyance was all or part of the consideration.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009

Dated: January 30, 2013.

David H. Wheeler Jr.

David H. Wheeler Jr., Grantor

STATE OF OREGON, County of Clackamas) ss.
This instrument was signed or acknowledged before me on January 30, 2013.

By:

OFFICIAL SEAL
JAYLIN D PALACIO
NOTARY PUBLIC - OREGON
COMMISSION NO. 458146
MY COMMISSION EXPIRES MAY 02, 2015

Jaylin D Palacio

Notary Public for State of Oregon
My commission expires: May 2, 2015

Delivered to and accepted by:

David H. Wheeler Sr.

David H. Wheeler Sr., Trustee, the David H. Wheeler Sr. Trust

ENGINEERING PLANNING
FORESTRY
13910 S.W. Galbreath Dr., Suite 100
Sherwood, Oregon 97140
Phone: (503) 925-8799
Fax: (503) 925-8969

AKS JOB No. 2142

LANDSCAPE ARCHITECTURE
SURVEYING
AKS Group of Companies:
SHERWOOD, OREGON
SALEM, OREGON
VANCOUVER, WASHINGTON
www.aks-eng.com

EXHIBIT A

Tract 2
City of Oregon City Planning File No. LL 12-01

A tract of land located in the Southwest One-Quarter of Section 7, Township 3 South, Range 2 East, Willamette Meridian, City of Oregon City, Clackamas County, Oregon, being more particularly described as follows:

Commencing at a 5/8 inch iron rod with a red plastic cap inscribed "AKS ENGR." at the southerly corner of Lot 75 of the plat "Hazel Creek Farms"; thence along the southwest line of said Lot 75, North 46°03'51" West 38.92 feet to a 5/8 inch iron rod with a yellow plastic cap inscribed "AKS ENGR."; thence along the northwest line of that tract of land conveyed to David H. Wheeler Jr. and Carol A. Wheeler in Document Number 2004-103478 and clarified in Boundary Line Agreement Document Number 2012-039420, Clackamas County Deed Records, South 45°09'43" West 483.16 feet to a set 5/8 inch iron rod with a yellow plastic cap inscribed "AKS ENGR." and the Point of Beginning; thence South 44°01'49" West 182.39 feet to a point on the northeasterly line of that tract of land conveyed to The Wheeler Family Investment Limited Partnership, an Oregon Limited Partnership in Document Number 2007-043768, Clackamas County Deed Records; thence along said northeasterly line and the northeasterly line, North 46°02'08" West 108.30 feet to a 6 inch by 6 inch stone with a "X" at the northerly corner thereof; thence along the northeasterly line of that tract of land conveyed to Edwin M. Tolstrup and Reitha M. Tolstrup in Document Number 2001-067656, Clackamas County Deed Records, North 46°03'35" West 400.00 feet to a 5/8 inch iron rod with a yellow plastic cap inscribed "AKS ENGR." at the southerly corner of that tract of land conveyed to David H. Wheeler Sr. Trust per Document Number 2002-068860, Clackamas County Deed Records; thence along the David H. Wheeler Sr. Trust tract, North 44°04'18" East 182.30 feet to a set 5/8 inch iron rod with a yellow plastic cap inscribed "AKS ENGR."; thence South 46°03'35" East 511.77 feet to the Point of Beginning.

The above described tract of land contains 2.13 acres, more or less.

06-25-12
REGISTERED
PROFESSIONAL
LAND SURVEYOR
OREGON
JANUARY 11, 2005
ROBERT D. RETTIG
60124LS
RENEWS: 12/31/12

FORM No. 961 – BARGAIN AND SALE DEED – STATUTORY FORM (Individual Grantor). STEVENS-NESS LAW PUBLISHING CO., PORTLAND, OR 97204

NA

BARGAIN AND SALE DEED — STATUTORY FORM

INDIVIDUAL GRANTOR

David H. Wheeler and Winifred L. Wheeler, husband and wife

Grantor,

conveys to Donald W. Wheeler and Roxanne O. Wheeler, husband and wife

Grantee, the following real property situated in Clackamas

County, Oregon, to-wit:

Beginning at a point which is North 42°15' East 57.36 Feet from the most Northerly corner of a tract of land conveyed to Frank Rotter and Anna Rotter as described in Vol. 133 Pg. 629 in the deed records for Clackamas County, Oregon; Thence South 47°36'06" East 443.46 Feet; Thence South 42°16'28" West 25.00 Feet; Thence North 47°36'06" West 417.45 Feet; Thence South 42°15' West 7.41 Feet; Thence North 47°30' West 26.00 Feet; Thence north 42°15' East 32.36 Feet to the point of beginning.

Recorded By First American Title Insurance Company of Oregon 74751

(IF SPACE INSUFFICIENT, CONTINUE DESCRIPTION ON REVERSE SIDE)

No *The true consideration for this conveyance is $* ** 0 *(Here comply with the requirements of ORS 93.030)*

** ~~Lot Line Adjustment~~

Dated this 19 *day of* April, *19* 94

David H. Wheeler

Winifred L. Wheeler

THIS INSTRUMENT WILL NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY APPROVED USES AND TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES AS DEFINED IN ORS 30.930.

STATE OF OREGON, County of Clackamas) ss.

This instrument was acknowledged before me on April 19, *19* 94,

by David H. Wheeler and Winifred L. Wheeler

OFFICIAL SEAL
SUSAN R. SEAWARD
NOTARY PUBLIC-OREGON
COMMISSION NO. 015780
MY COMMISSION EXPIRES MAY 31, 1996

Notary Public for Oregon

My commission expires 5/31/96

BARGAIN AND SALE DEED

David H. & Winifred L. Wheeler, GRANTOR
Donald W. & Roxanne O. Wheeler, GRANTEE

GRANTEE'S ADDRESS, ZIP

After recording return to:

A. Gregory McKenzie
1600 Willamette Falls Drive
West Linn, OR 97068

NAME, ADDRESS, ZIP

Until a change is requested, all tax statements shall be sent to the following address:

Donald W. Wheeler
Roxanne O. Wheeler
19898 S. White Lane
Oregon City, OR 97045

NAME, ADDRESS, ZIP

STATE OF OREGON
County of Clackamas } ss

I, John Kauffman, County Clerk, for the County of Clackamas, do hereby certify that the instrument of writing was received for recording in the records of said county at

94 APR 22 PM 3:20

COUNTY OF CLACKAMAS * OREGON * STATE OF

Witness my hand and seal affixed

JOHN KAUFFMAN
County Clerk

Deputy

Recording Certificate
CCP-R4 (Rev. 6/91)

94 34241

94 34241

Fidelity National Title OREGON

Property Profile Report

Address Not Available

Ownership Information

Owner Name:	Please see attached vesting deed for current ownership.
Mailing Address:	19566 CENTRAL POINT RD OREGON CITY, OR 97045

Property Description

County:	Clackamas	Map / Tax Lot:	31E12D/01700
Account Num:	00763276	Owner Occ.:	No
Land Use:	540-	Census:	
Map Grid:	717-B5		
Subdivision:			

Legal Description: Section 12 Township 3S Range 1E Quarter D TAX LOT 01700 SEE SPLIT CODE ACCT 01790

Property Characteristics

Property Type:	AGRICULTURAL	Building SF:		Pool:	No
House Style:		Living Area SF:		Deck SF:	
Year Built:		Square Feet:	0	Deck Desc:	
Bedrooms:		1st Floor SF:		Patio SF:	
Bathrooms:		2nd Floor SF:		Patio Desc:	
Heat:		3rd Floor SF:		Foundation:	
Cooling:		Attic SF:		Exterior:	
Lot Size:	190,697	Bsmnt SF:		Ext. Finish:	
Acres:	4.62	Fin Bsmt SF:		Interior:	
Garage Type:		Garage SF:		Roof Style:	
Fireplaces:		Bsmnt Type:		Roof Cover:	

Assessment Information

Real Market Value:	$ 270,495	Land Value:	$ 270,495	Imp. Value:	$ 0
Total Assessed Value:	$ 3,738	Levy Code:	062064	M-5 Rate:	.0182
Taxes:	$ 67.91	Tax Year:	15-16		

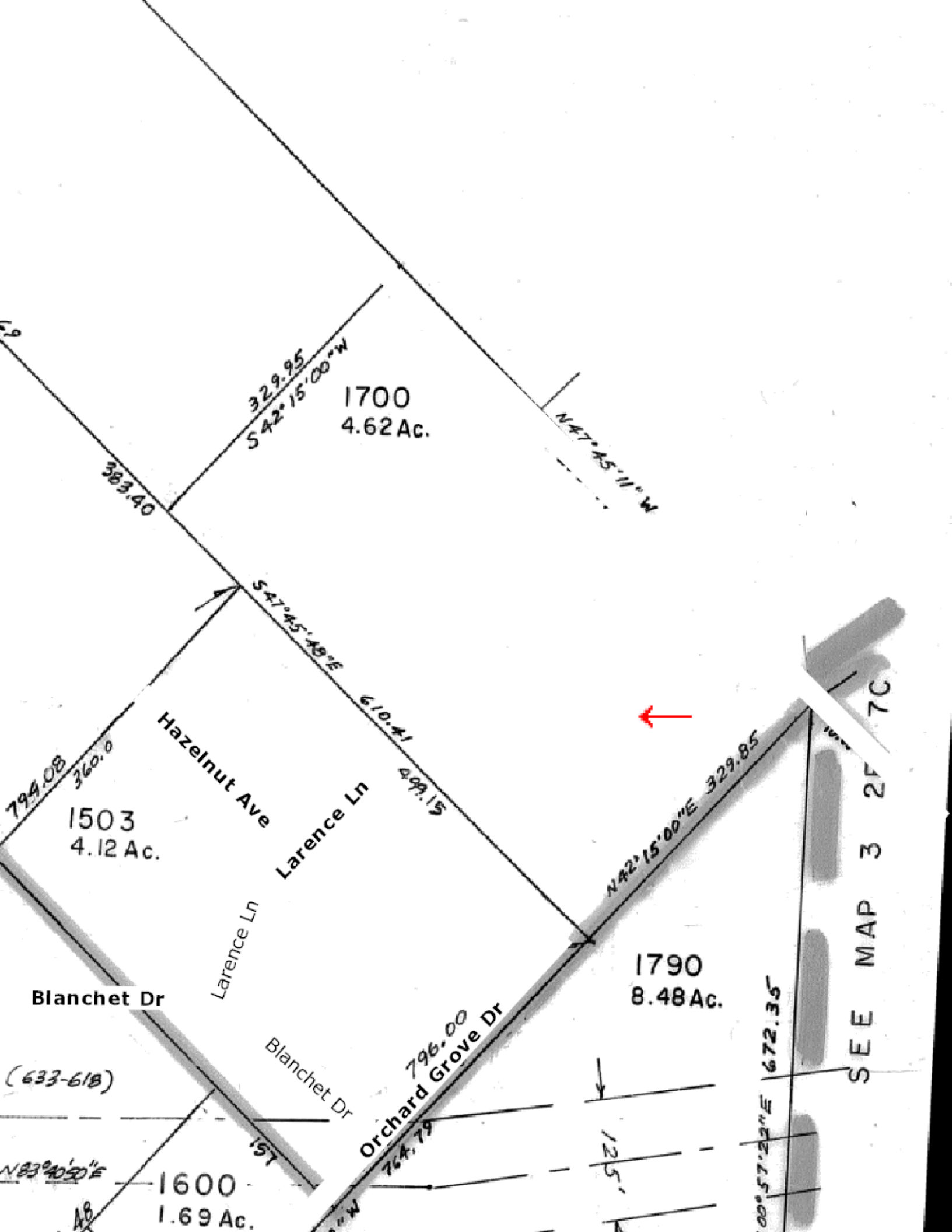
Previous Sale Information

Sale Amount:	Sale Date:	Document Num:

Transaction History

Sale Date	Sale Amount	HPI Sale Amount	Document Type	Reception Num	Book/Page
10/8/2013	$ 0		S	2013-070116	/
7/1/1993	$ 0			1993-047696	/

All information provided by ValueCheck, Inc is deemed reliable, but not guaranteed.
Accuracy of the information may vary by county.


1700
4.62 Ac.
329.95
S 42° 15' 00" W
N 47° 45' 11" W
383.40
S 47° 45' 49" E
610.41
499.15
1503
4.12 Ac.
799.08
360.0
Hazelnut Ave
Larence Ln
Larence Ln
Blanchet Dr
Blanchet Dr
N 42° 15' 00" E 329.85
1790
8.48 Ac.
796.00
Orchard Grove Dr
764.79
1600
1.69 Ac.
(633-618)
151
125'
672.35
SEE MAP 3 2F 7C

3P

BARGAIN AND SALE DEED

Wheeler Family Investment Limited Partnership
19566 S Central Point Rd.
Oregon City, OR 97045

GRANTORS

TO
Wheeler Family, Enterprises LLC
19566 S Central Point Rd.
Oregon City, OR 97045

GRANTEE

After recording, return to:

Tayda Ross
Tyler Smith
Tyler Smith & Associates P.C.
181 N Grant St. STE 212
Canby, OR 97013

Clackamas County Official Records
Sherry Hall, County Clerk
2013-070116

01723548201300701160030033
$58.00
10/08/2013 01:29:11 PM

D-D Cnt=1 Stn=9 COUNTER1
$15.00 $10.00 $16.00 $17.00

Until a change is requested, all tax statements shall be sent to:
Wheeler Family Enterprises, LLC
19566 S Central Point Rd.
Oregon City, OR 97045

STATUTORY BARGAIN AND SALE DEED

Wheeler Family Investment Limited Partnership, **GRANTOR**, herby conveys to Wheeler Family Enterprises, LLC, as **GRANTEE**, the following described real property:

See attachment Exhibit A, (lot to be conveyed commonly known as Tax Lot 1700, T3S R1E Section 12D).

No monetary consideration for this conveyance was all or part of the consideration.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE

UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009

Dated: October 8, 2013.

David H. Wheeler Sr.

David H. Wheeler Sr., General Partner Wheeler Family Investments Limited Partnership

STATE OF OREGON,)
County of Clackamas) ss.
This instrument was signed or acknowledged by David Wheeler, before me on October 8, 2013.

Sherry B Smith

Notary Public for State of Oregon
My commission expires: July 14, 2016

OFFICIAL SEAL
SHERRY B SMITH
NOTARY PUBLIC - OREGON
COMMISSION NO. 469538
MY COMMISSION EXPIRES JULY 14, 2016

Delivered to and accepted by:

David H. Wheeler Sr.

David H. Wheeler Sr., Member Wheeler Family Enterprises, LLC

EXHIBIT A

Beginning at a point on the northeasterly line of that tract of land described in Recorders Fee 93-47696, Clackamas County Deed Records, located in the S.E. 1/4 of Section 12, T.3S., R.1E., and the S.W. 1/4 of Section 7, T.3S., R.2E., W.M., Clackamas County, Oregon, said point being S42°41'31"W 65.05 feet and S47°45'11"E 677.68 feet from a 5/8 inch iron rod marking the most northerly curve point of Lot 1, "Filbert Orchard"; thence, leaving said northeasterly line, S42° 15'00"W 329.95 feet to the southwesterly line of said tract; thence, on the southwesterly line S47°45'48"E 610.41 feet to the most southerly corner of said track; thence, on the southeasterly line of said tract, N42°15'00"E 329.85 feet to the most easterly corner of said tract; thence, on the northeasterly line of said tract N47°45'11"W 610.41 feet to the POINT OF BEGINNING.

The tract known as tax lot 1700 conveyed herein contains 4.62 acres, more or less.

Subject to any easements of record.

Fidelity National Title OREGON

Property Profile Report

Address Not Available

Ownership Information

Owner Name:	Please see attached vesting deed for current ownership.
Mailing Address:	19566 CENTRAL POINT RD OREGON CITY, OR 97045

Property Description

County:	Clackamas	Map / Tax Lot:	31E12D/01790
Account Num:	01655729	Owner Occ.:	No
Land Use:	640-	Census:	
Map Grid:	717-A6		
Subdivision:			

Legal Description: Section 12 Township 3S Range 1E Quarter D TAX LOT 01790 SEE SPLIT CODE ACCT 01700

Property Characteristics

Property Type:	VACANT LAND	Building SF:		Pool:	No
House Style:		Living Area SF:		Deck SF:	
Year Built:		Square Feet:	0	Deck Desc:	
Bedrooms:		1st Floor SF:		Patio SF:	
Bathrooms:		2nd Floor SF:		Patio Desc:	
Heat:		3rd Floor SF:		Foundation:	
Cooling:		Attic SF:		Exterior:	
Lot Size:	346,764	Bsmnt SF:		Ext. Finish:	
Acres:	8.48	Fin Bsmt SF:		Interior:	
Garage Type:		Garage SF:		Roof Style:	
Fireplaces:		Bsmnt Type:		Roof Cover:	

Assessment Information

Real Market Value:	$ 376,049	Land Value:	$ 376,049	Imp. Value:	$ 0
Total Assessed Value:	$ 2,985	Levy Code:	062002	M-5 Rate:	.0182
Taxes:	$ 54.23	Tax Year:	15-16		

Previous Sale Information

Sale Amount:	Sale Date:	Document Num:

Transaction History

Sale Date	Sale Amount	HPI Sale Amount	Document Type	Reception Num	Book/Page
10/8/2013	$ 0		S	2013-070117	/

All information provided by ValueCheck, Inc is deemed reliable, but not guaranteed.
Accuracy of the information may vary by county.

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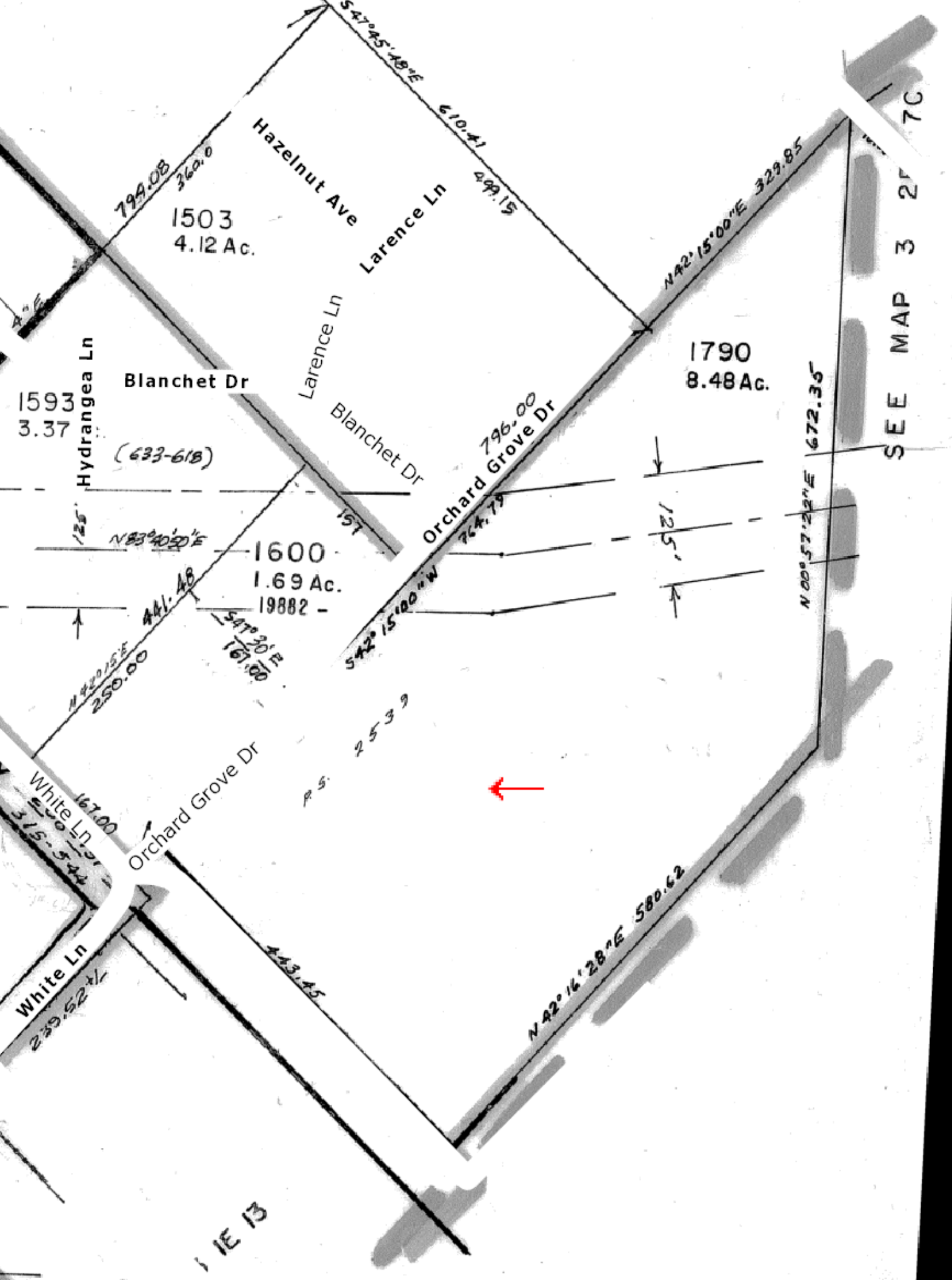
Hazelnut Ave
Larence Ln
Larence Ln
Blanchet Dr
Blanchet Dr
Hydrangea Ln
Orchard Grove Dr
Orchard Grove Dr
White Ln
White Ln
1503
4.12 Ac.
1593
3.37
1600
1.69 Ac.
1790
8.48 Ac.
SEE MAP 3 2
S47°45'48"E 610.41
499.15
194.08
360.0
N42°15'00"E 329.85
672.35
N83°40'20"E
441.48
S47°20'
161.81'
N42°15'E
250.00
796.00
764.79
S42°15'00"W
N00°57'22"E
167.00
443.45
N42°16'28"E 580.62
239.52+/-
(633-618)
19882
125'
151'
12'

3P

BARGAIN AND SALE DEED

Wheeler Family Investment Limited Partnership
19566 S Central Point Rd.
Oregon City, OR 97045

GRANTORS

TO

Wheeler Family, Enterprises LLC
19566 S Central Point Rd.
Oregon City, OR 97045

GRANTEE

After recording, return to:

Fayda Ross

Tyler Smith
Tyler Smith & Associates P.C.
181 N Grant St. STE 212
Canby, OR 97013

Clackamas County Official Records
Sherry Hall, County Clerk

2013-070117

$58.00

01723549201300701170030030

10/08/2013 01:29:11 PM

D-D Cnt=1 Stn=9 COUNTER1
$15.00 $10.00 $16.00 $17.00

Until a change is requested, all tax statements shall be sent to:
Wheeler Family Enterprises, LLC
19566 S Central Point Rd.
Oregon City, OR 97045

STATUTORY BARGAIN AND SALE DEED

Wheeler Family Investment Limited Partnership, **GRANTOR**, herby conveys to Wheeler Family Enterprises, LLC, as **GRANTEE**, the following described real property:

See attachment Exhibit A, (lot to be conveyed commonly known as Tax Lot 1790, T3S R1E Section 12D).

No monetary consideration for this conveyance was all or part of the consideration.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE

UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009

Dated: October 8, 2013.

David H. Wheeler Sr

David H. Wheeler Sr., General Partner Wheeler Family Investments Limited Partnership

STATE OF OREGON,)
County of Clackamas) ss.
This instrument was signed or acknowledged by David Wheeler, before me on October 8, 2013.

OFFICIAL SEAL
SHERRY B SMITH
NOTARY PUBLIC - OREGON
COMMISSION NO. 469538
MY COMMISSION EXPIRES JULY 14, 2016

Sherry B Smith

Notary Public for State of Oregon
My commission expires: July 14, 2016

Delivered to and accepted by:

David H Wheeler Sr.

David H. Wheeler Sr., Member, Wheeler Enterprises LLC

EXHIBIT A

Beginning at a point on the northeasterly line of that tract of land described in Recorders Fee 93-47696, Clackamas County Deed Records, located in the S.E. 1/4 of Section 12, T.3S., R.1E., and the S.W. 1/4 of Section 7, T.3S., R.2E., W.M., Clackamas County, Oregon, said point being S42° 41'31"W 65.05 feet and S47° 45'11" E 677.68 feet from a 5/8 inch rod marking the most northerly curve point of Lot 1, "Filbert Orchard"; thence, leaving said northeasterly line, S42° 150' 0"W 329.95 feet to the southwesterly line of said tract; thence, on said southwesterly line S47°45' 48"E 610.41 feet to the most southerly corner of said tract, said corner being on the northwesterly line of that tract of land described in Recorders Fee No. 83-11698, Clackamas County deed Records; thence, on said northwesterly line S42°15' 00" W 764.79 feet to the most westerly corner of said tract; thence, on the southwesterly line of said tract S47°36' 06"E 443.45 feet; thence N42° 16' 28"E 580.62 feet; thence, N00°57'22"E 672.35 feet to the northwesterly line of said tract (Fee 83-11698); thence, on said northwesterly line N42°15'00"E 10.00 feet to the most easterly corner of said tract (Fee No. 93-47696); thence, on the northeasterly line of said tract N47°45'11"W 610.41 feet to the POINT OF BEGINNING.

(Above description includes both tax lot 1700 and 1790 as recorded and described in the boundary line agreement recorded in Clackamas County Records document number 2003-085041, Exhibit C).

EXCLUDING that portion of above description known as tax lot 1700 which is being conveyed by separate document, with full description of excluded portion being:

Beginning at a point on the northeasterly line of that tract of land described in Recorders Fee 93-47696, Clackamas County Deed Records, located in the S.E. 1/4 of Section 12, T.3S., R.1E., and the S.W. 1/4 of Section 7, T.3S., R.2E., W.M., Clackamas County, Oregon, said point being S42°41'31"W 65.05 feet and S47°45'11"E 677.68 feet from a 5/8 inch iron rod marking the most northerly curve point of Lot 1, "Filbert Orchard"; thence, leaving said northeasterly line, S42° 15'00"W 329.95 feet to the southwesterly line of said tract; thence, on the southwesterly line S47°45'48"E 610.41 feet to the most southerly corner of said track; thence, on the southeasterly line of said tract, N42°15'00"E 329.85 feet to the most easterly corner of said tract; thence, on the northeasterly line of said tract N47°45'45'11"W 610.41 feet to the POINT OF BEGINNING. (The tract known as tax lot 1700 contains 4.62 acres, more or less).

With the parcel being conveyed under this document consisting of 8.48 acres more or less.

Subject to any easements of record.

Exhibit E: 2016 Property Tax Statements

07/01/2016 - 06/30/2017 REAL PROPERTY TAX STATEMENT

CLACKAMAS COUNTY, OREGON * 150 BEAVERCREEK RD * OREGON CITY, OREGON 97045

PROPERTY DESCRIPTION | **MAP: 32E07C 01001** | **ACCOUNT NO: 00862748**

NO SITUS

ADDRESS OR

Code Area: 062-064

Acres: 4.21

Farm Deferral - POTENTIAL ADDITIONAL TAX

VALUES:	LAST YEAR	THIS YEAR
REAL MARKET VALUES (RMV):		
RMV LAND	557,432	711,855
RMV BLDG		
RMV TOTAL	557,432	711,855
M5 TOTAL (SAV)	9,506	10,062
ASSESSED VALUE	3,406	3,507
TOTAL TAXABLE AV	3,406	3,507
PROPERTY TAXES:	**61.88**	**63.47**

* Property taxes may be paid online, see applicable fees prior to paying.
* Payments may be mailed to PO Box 6100, Portland, OR 97228-6100. When paying by mail, please make checks payable to Clackamas County Tax Collector.
* You may also pay in our office, located in the Development Services Building at 150 Beavercreek Road in Oregon City.
* If your mortgage company pays your taxes, this information is for your records.

TAX PAYMENT OPTIONS

Payment Options	Date Due	Discount Allowed		Net Amount
FULL	**Nov 15th, 2016**	**1.90**	**3%**	**61.57**
2/3	**Nov 15th, 2016**	**0.85**	**2%**	**41.46**
1/3	**Nov 15th, 2016**			**21.15**

2016 - 2017 CURRENT TAX BY DISTRICT:

COM COLL CLACK	1.85
ESD CLACKAMAS	1.23
SCH OREGON CITY	16.56
EDUCATION TOTAL:	**19.64**
CITY OREGON CITY	14.70
COUNTY CLACKAMAS	8.02
COUNTY EXTENSION & 4-H	0.17
COUNTY LIBRARY	1.32
COUNTY PUBLIC SFTY LOC OPT	0.87
COUNTY SOIL CONS	0.17
FD 1 CLACK CO	7.93
PORT OF PTLD	0.23
SRV 2 METRO	0.32
SRV 2 METRO LOC OPT	0.34
URBAN RENEWAL COUNTY	0.12
URBAN RENEWAL OREGON CITY	2.95
VECTOR CONTROL	0.02
VECTOR CONTROL LOC OPT	0.09
GENERAL GOVERNMENT TOTAL:	**37.25**
CITY OREGON CITY BOND	0.31
COM COLL CLACK BOND	0.62
FD 1 CLACK CO BOND	0.32
SCH OREGON CITY BOND	4.62
SRV 2 METRO BOND	0.71
EXCLUDED FROM LIMIT TOTAL:	**6.58**
2016 - 2017 TAX BEFORE DISCOUNT	**63.47**

DELINQUENT TAXES: **0.00**

TOTAL (after discount) **61.57**

Delinquent tax amount is included in payment options listed below. Delinquent taxes marked with an (*) are subject to foreclosure if not paid on or before May 15th.

The on-line tax statement information reflects the certified property tax as of the October certification date for the tax year referenced. This information does not reflect any tax payments, value corrections, or delinquent interest on an account after the due date listed. If you have questions or need current tax balance information, please contact our office at 503-655-8671. Our office hours are Monday through Thursday from 7:00 am to 6:00 pm; Clackamas County offices are closed on Fridays. You can leave a voice mail message or email us at PropertyTaxInfo@co.clackamas.or.us, our goal is to respond to you on the following business day.

07/01/2016 - 06/30/2017 REAL PROPERTY TAX STATEMENT

CLACKAMAS COUNTY, OREGON * 150 BEAVERCREEK RD * OREGON CITY, OREGON 97045

PROPERTY DESCRIPTION | **MAP: 32E07C 01100** | **ACCOUNT NO: 00862828**

NO SITUS

ADDRESS OR

Code Area: 062-064

Acres: 2.13

Farm Deferral - POTENTIAL ADDITIONAL TAX

VALUES:	LAST YEAR	THIS YEAR
REAL MARKET VALUES (RMV):		
RMV LAND	179,617	229,376
RMV BLDG	92,360	99,970
RMV TOTAL	271,977	329,346
M5 TOTAL (SAV)	189,672	223,682
ASSESSED VALUE	132,652	136,631
TOTAL TAXABLE AV	132,652	136,631
PROPERTY TAXES:	**2,409.93**	**2,472.46**

* Property taxes may be paid online, see applicable fees prior to paying.
* Payments may be mailed to PO Box 6100, Portland, OR 97228-6100. When paying by mail, please make checks payable to Clackamas County Tax Collector.
* You may also pay in our office, located in the Development Services Building at 150 Beavercreek Road in Oregon City.
* If your mortgage company pays your taxes, this information is for your records.

TAX PAYMENT OPTIONS

Payment Options	Date Due	Discount Allowed		Net Amount
FULL	**Nov 15th, 2016**	**74.17**	**3%**	**2,398.29**
2/3	**Nov 15th, 2016**	**32.97**	**2%**	**1,615.34**
1/3	**Nov 15th, 2016**			**824.16**

2016 - 2017 CURRENT TAX BY DISTRICT:

COM COLL CLACK	72.15
ESD CLACKAMAS	47.74
SCH OREGON CITY	645.38
EDUCATION TOTAL:	**765.27**
CITY OREGON CITY	573.30
COUNTY CLACKAMAS	312.56
COUNTY EXTENSION & 4-H	6.48
COUNTY LIBRARY	51.46
COUNTY PUBLIC SFTY LOC OPT	33.88
COUNTY SOIL CONS	6.48
FD 1 CLACK CO	308.81
PORT OF PTLD	9.09
SRV 2 METRO	12.50
SRV 2 METRO LOC OPT	13.12
URBAN RENEWAL COUNTY	4.71
URBAN RENEWAL OREGON CITY	114.66
VECTOR CONTROL	0.85
VECTOR CONTROL LOC OPT	3.42
GENERAL GOVERNMENT TOTAL:	**1,451.32**
CITY OREGON CITY BOND	12.21
COM COLL CLACK BOND	24.27
FD 1 CLACK CO BOND	12.65
SCH OREGON CITY BOND	178.91
SRV 2 METRO BOND	27.83
EXCLUDED FROM LIMIT TOTAL:	**255.87**
2016 - 2017 TAX BEFORE DISCOUNT	**2,472.46**

DELINQUENT TAXES: **0.00**

TOTAL (after discount) **2,398.29**

Delinquent tax amount is included in payment options listed below. Delinquent taxes marked with an (*) are subject to foreclosure if not paid on or before May 15th.

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07/01/2016 - 06/30/2017 REAL PROPERTY TAX STATEMENT

CLACKAMAS COUNTY, OREGON * 150 BEAVERCREEK RD * OREGON CITY, OREGON 97045

PROPERTY DESCRIPTION | **MAP: 32E07C 01180** | **ACCOUNT NO: 00862837**

NO SITUS

ADDRESS OR

Code Area: 062-002

Acres: 2.63

Mixed Use Deferral - POTENTIAL ADDITIONAL TAX

VALUES:	LAST YEAR	THIS YEAR
REAL MARKET VALUES (RMV):		
RMV LAND	236,355	301,832
RMV BLDG		
RMV TOTAL	236,355	301,832
M5 TOTAL (SAV)	5,062	5,335
ASSESSED VALUE	1,914	1,970
TOTAL TAXABLE AV	1,914	1,970
PROPERTY TAXES:	**34.78**	**35.65**

* Property taxes may be paid online, see applicable fees prior to paying.
* Payments may be mailed to PO Box 6100, Portland, OR 97228-6100. When paying by mail, please make checks payable to Clackamas County Tax Collector.
* You may also pay in our office, located in the Development Services Building at 150 Beavercreek Road in Oregon City.
* If your mortgage company pays your taxes, this information is for your records.

TAX PAYMENT OPTIONS

Payment Options	Date Due	Discount Allowed		Net Amount
FULL	**Nov 15th, 2016**	**1.07**	**3%**	**34.58**
2/3	**Nov 15th, 2016**	**0.48**	**2%**	**23.29**
1/3	**Nov 15th, 2016**			**11.89**

2016 - 2017 CURRENT TAX BY DISTRICT:

COM COLL CLACK	1.04
ESD CLACKAMAS	0.69
SCH OREGON CITY	9.30
EDUCATION TOTAL:	**11.03**
CITY OREGON CITY	8.30
COUNTY CLACKAMAS	4.51
COUNTY EXTENSION & 4-H	0.09
COUNTY LIBRARY	0.74
COUNTY PUBLIC SFTY LOC OPT	0.49
COUNTY SOIL CONS	0.09
FD 1 CLACK CO	4.45
PORT OF PTLD	0.13
SRV 2 METRO	0.18
SRV 2 METRO LOC OPT	0.19
URBAN RENEWAL COUNTY	0.06
URBAN RENEWAL OREGON CITY	1.64
VECTOR CONTROL	0.01
VECTOR CONTROL LOC OPT	0.05
GENERAL GOVERNMENT TOTAL:	**20.93**
CITY OREGON CITY BOND	0.18
COM COLL CLACK BOND	0.35
FD 1 CLACK CO BOND	0.18
SCH OREGON CITY BOND	2.58
SRV 2 METRO BOND	0.40
EXCLUDED FROM LIMIT TOTAL:	**3.69**
2016 - 2017 TAX BEFORE DISCOUNT	**35.65**

DELINQUENT TAXES: **0.00**

TOTAL (after discount) **34.58**

Delinquent tax amount is included in payment options listed below. Delinquent taxes marked with an (*) are subject to foreclosure if not paid on or before May 15th.

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07/01/2016 - 06/30/2017 REAL PROPERTY TAX STATEMENT

CLACKAMAS COUNTY, OREGON * 150 BEAVERCREEK RD * OREGON CITY, OREGON 97045

PROPERTY DESCRIPTION | **MAP: 32E07C 01291** | **ACCOUNT NO: 01655738**

NO SITUS

ADDRESS OR

Code Area: 062-002

Acres: 0.26

Forest Deferral - POTENTIAL ADDITIONAL TAX

VALUES:	LAST YEAR	THIS YEAR
REAL MARKET VALUES (RMV):		
RMV LAND	4,288	5,475
RMV BLDG		
RMV TOTAL	4,288	5,475
M5 TOTAL (SAV)	180	180
ASSESSED VALUE	111	114
TOTAL TAXABLE AV	111	114
PROPERTY TAXES:	**2.02**	**2.06**

* Property taxes may be paid online, see applicable fees prior to paying.
* Payments may be mailed to PO Box 6100, Portland, OR 97228-6100. When paying by mail, please make checks payable to Clackamas County Tax Collector.
* You may also pay in our office, located in the Development Services Building at 150 Beavercreek Road in Oregon City.
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TAX PAYMENT OPTIONS

Payment Options	Date Due	Discount Allowed		Net Amount
FULL	**Nov 15th, 2016**	**0.06**	**3%**	**2.00**
2/3	**Nov 15th, 2016**	**0.03**	**2%**	**1.34**
1/3	**Nov 15th, 2016**			**0.68**

2016 - 2017 CURRENT TAX BY DISTRICT:

COM COLL CLACK	0.06
ESD CLACKAMAS	0.04
SCH OREGON CITY	0.54
EDUCATION TOTAL:	**0.64**
CITY OREGON CITY	0.49
COUNTY CLACKAMAS	0.26
COUNTY EXTENSION & 4-H	0.01
COUNTY LIBRARY	0.04
COUNTY PUBLIC SFTY LOC OPT	0.03
COUNTY SOIL CONS	0.01
FD 1 CLACK CO	0.26
PORT OF PTLD	0.01
SRV 2 METRO	0.01
SRV 2 METRO LOC OPT	0.01
URBAN RENEWAL OREGON CITY	0.08
GENERAL GOVERNMENT TOTAL:	**1.21**
CITY OREGON CITY BOND	0.01
COM COLL CLACK BOND	0.02
FD 1 CLACK CO BOND	0.01
SCH OREGON CITY BOND	0.15
SRV 2 METRO BOND	0.02
EXCLUDED FROM LIMIT TOTAL:	**0.21**
2016 - 2017 TAX BEFORE DISCOUNT	**2.06**

DELINQUENT TAXES: **0.00**

TOTAL (after discount) **2.00**

Delinquent tax amount is included in payment options listed below. Delinquent taxes marked with an (*) are subject to foreclosure if not paid on or before May 15th.

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07/01/2016 - 06/30/2017 REAL PROPERTY TAX STATEMENT

CLACKAMAS COUNTY, OREGON * 150 BEAVERCREEK RD * OREGON CITY, OREGON 97045

PROPERTY DESCRIPTION | **MAP: 31E12D 01700** | **ACCOUNT NO: 00763276**

NO SITUS

ADDRESS OR

Code Area: 062-064

Acres: 4.62

Farm Deferral - POTENTIAL ADDITIONAL TAX

VALUES:	LAST YEAR	THIS YEAR
REAL MARKET VALUES (RMV):		
RMV LAND	270,495	345,430
RMV BLDG		
RMV TOTAL	270,495	345,430
M5 TOTAL (SAV)	10,432	11,042
ASSESSED VALUE	3,738	3,848
TOTAL TAXABLE AV	3,738	3,848
PROPERTY TAXES:	**67.91**	**69.64**

* Property taxes may be paid online, see applicable fees prior to paying.
* Payments may be mailed to PO Box 6100, Portland, OR 97228-6100. When paying by mail, please make checks payable to Clackamas County Tax Collector.
* You may also pay in our office, located in the Development Services Building at 150 Beavercreek Road in Oregon City.
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TAX PAYMENT OPTIONS

Payment Options	Date Due	Discount Allowed		Net Amount
FULL	**Nov 15th, 2016**	**2.09**	**3%**	**67.55**
2/3	**Nov 15th, 2016**	**0.93**	**2%**	**45.50**
1/3	**Nov 15th, 2016**			**23.22**

2016 - 2017 CURRENT TAX BY DISTRICT:

COM COLL CLACK	2.03
ESD CLACKAMAS	1.34
SCH OREGON CITY	18.18
EDUCATION TOTAL:	**21.55**
CITY OREGON CITY	16.14
COUNTY CLACKAMAS	8.80
COUNTY EXTENSION & 4-H	0.18
COUNTY LIBRARY	1.45
COUNTY PUBLIC SFTY LOC OPT	0.95
COUNTY SOIL CONS	0.18
FD 1 CLACK CO	8.70
PORT OF PTLD	0.26
SRV 2 METRO	0.35
SRV 2 METRO LOC OPT	0.37
URBAN RENEWAL COUNTY	0.13
URBAN RENEWAL OREGON CITY	3.24
VECTOR CONTROL	0.02
VECTOR CONTROL LOC OPT	0.10
GENERAL GOVERNMENT TOTAL:	**40.87**
CITY OREGON CITY BOND	0.34
COM COLL CLACK BOND	0.68
FD 1 CLACK CO BOND	0.36
SCH OREGON CITY BOND	5.05
SRV 2 METRO BOND	0.79
EXCLUDED FROM LIMIT TOTAL:	**7.22**
2016 - 2017 TAX BEFORE DISCOUNT	**69.64**

DELINQUENT TAXES: **0.00**

TOTAL (after discount) **67.55**

Delinquent tax amount is included in payment options listed below. Delinquent taxes marked with an (*) are subject to foreclosure if not paid on or before May 15th.

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07/01/2016 - 06/30/2017 REAL PROPERTY TAX STATEMENT

CLACKAMAS COUNTY, OREGON * 150 BEAVERCREEK RD * OREGON CITY, OREGON 97045

PROPERTY DESCRIPTION | **MAP: 31E12D 01790** | **ACCOUNT NO: 01655729**

NO SITUS

ADDRESS OR

Code Area: 062-002

Acres: 8.48

Forest Deferral - POTENTIAL ADDITIONAL TAX

VALUES:	LAST YEAR	THIS YEAR
REAL MARKET VALUES (RMV):		
RMV LAND	376,049	480,224
RMV BLDG		
RMV TOTAL	376,049	480,224
M5 TOTAL (SAV)	4,848	4,855
ASSESSED VALUE	2,985	3,076
TOTAL TAXABLE AV	2,985	3,076
PROPERTY TAXES:	**54.23**	**55.66**

* Property taxes may be paid online, see applicable fees prior to paying.
* Payments may be mailed to PO Box 6100, Portland, OR 97228-6100. When paying by mail, please make checks payable to Clackamas County Tax Collector.
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TAX PAYMENT OPTIONS

Payment Options	Date Due	Discount Allowed		Net Amount
FULL	**Nov 15th, 2016**	**1.67**	**3%**	**53.99**
2/3	**Nov 15th, 2016**	**0.74**	**2%**	**36.37**
1/3	**Nov 15th, 2016**			**18.56**

2016 - 2017 CURRENT TAX BY DISTRICT:

COM COLL CLACK	1.62
ESD CLACKAMAS	1.07
SCH OREGON CITY	14.54
EDUCATION TOTAL:	**17.23**
CITY OREGON CITY	12.91
COUNTY CLACKAMAS	7.04
COUNTY EXTENSION & 4-H	0.15
COUNTY LIBRARY	1.16
COUNTY PUBLIC SFTY LOC OPT	0.76
COUNTY SOIL CONS	0.15
FD 1 CLACK CO	6.95
PORT OF PTLD	0.20
SRV 2 METRO	0.28
SRV 2 METRO LOC OPT	0.30
URBAN RENEWAL COUNTY	0.10
URBAN RENEWAL OREGON CITY	2.57
VECTOR CONTROL	0.02
VECTOR CONTROL LOC OPT	0.08
GENERAL GOVERNMENT TOTAL:	**32.67**
CITY OREGON CITY BOND	0.27
COM COLL CLACK BOND	0.55
FD 1 CLACK CO BOND	0.28
SCH OREGON CITY BOND	4.04
SRV 2 METRO BOND	0.62
EXCLUDED FROM LIMIT TOTAL:	**5.76**
2016 - 2017 TAX BEFORE DISCOUNT	**55.66**

DELINQUENT TAXES: **0.00**

TOTAL (after discount) **53.99**

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Exhibit F: Approved Subdivision Name

REQUEST TO RESERVE SUBDIVISION / CONDOMINIUM NAME

Clackamas County Surveyor's Office
150 Beavercreek Road #325
Oregon City, OR 97045
(503) 742-4475 / FAX (503) 742-4481
E-mail address: surveyor@clackamas.us

PLAT NAME REQUESTED:
Wheeler Farms

	TWP/RANGE:	**SECTION#:**	**TAX LOT#(s):**
***Location of Plat*:**	32E 31E	07C 12D	1001, 1100, 1180, 1291 1700, 1790

I understand that if the above name plat is not pending or recorded within two years, the name will be removed from the reserved list.

RESERVED BY:

DATE:	**TELEPHONE:**	**FAX:**
04/03/2017	(503) 563 - 6151	(503) 563 - 6152
EMAIL ADDRESS: scheideggerm@aks-eng.com		
PLAT SURVEYOR: #		
NAME OF DEVELOPER:		
ADDRESS:		
DATE:	**TELEPHONE:** ( ) -	**FAX:** ( ) -
EMAIL ADDRESS:		

APPROVED BY:	**APPROVAL DATE:**

Matt Scheidegger

From: Fuller, Debbie <DebbieFul@co.clackamas.or.us>
Sent: Tuesday, April 4, 2017 8:42 AM
To: Matt Scheidegger
Subject: Good News for You!

Categories: Filed by Newforma

Hey Matt,

Ray and I confer that the requested name of "Wheeler Farms" is approved. Since the other plat recorded 22 years ago, it doesn't seem feasible that they would be developing any further plats with that name.
Have a wonderful day! ☺

Debbie Fuller
Department of Transportation & Development
County Surveyor & Engineering
Phone: 503.742.4492 | Email: debbieful@clackamas.us
My office hours 7:30-4:30 Monday – Thursday and Friday 7:30-3:00

The Clackamas County Department of Transportation and Development is dedicated to providing excellent customer service. Please help us to serve you better by giving us your feedback. We appreciate your comments and will use them to evaluate and improve the quality of our public service.

Exhibit G: Draft CC&R's

DRAFT

AFTER RECORDING, RETURN TO:

DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS

This Declaration of Protective Covenants, Conditions and Restrictions ("Declaration") is made and effective the ____, day of _____, 2017. This Declaration affects that certain real property (the "Property") located in the City of Oregon City, Clackamas County, Oregon and more particularly described as Lots 1 through 77, inclusive, as shown on Subdivision Plat _____ (the "Plat) recorded in the official records of Clackamas County on _____, and all improvements now existing or to be constructed on Property, which Property and improvements are collectively known and referred to as Wheeler Farms.

RECITALS, INTENT AND PURPOSE

A. _____ is the owner in fee simple of the Property and the Declarant herein.

NOW, THEREFORE, for such purposes, Declarant makes this Declaration for governance of the Property:

DECLARATION

Declarant hereby declares on behalf of itself, its successors, grantees and assigns, as well as any and all persons having, acquiring or seeking to have or acquire any interest of any nature whatsoever in and to any part of the Property, as follows:

1. Definitions. Except as otherwise provided or modified by this Section 1, the terms contained herein shall have the meaning set forth in the Oregon Planned Community Act, ORS 94.550 et seq. As used in this Declaration, the following terms shall have the following meanings:

1.1 Mortgage. Mortgage means a recorded first mortgage, first trust deed or first contract of sale that creates a first lien against a Lot, and “Mortgagee” means the holder,

beneficiary or vendor of such a mortgage, trust deed or contract of sale, but only when such holder, beneficiary or vendor notifies the Association in writing of the existence of such mortgage and gives the Association a current name and mailing address.

1.2 Owner. Owner means the sole, or all joint, owners of one or more Lots.

1.3 Plat. Plat has the meaning provided in the initial paragraph of this Declaration.

2. Name Description

2.1. Name. The name by which the Property shall be known is Wheeler Farms.

2.2. Lot Designation. The Property is comprised of seventy-seven (77) Lots, each suitable for construction of one residential building, and easements as described in the Plat. The boundaries, designation, location and dimensions of each Lot are shown on the Plat.

3. Easements. Easements are reserved as shown on the Plat. Within these easements no structure, planting or other materials shall be placed or permitted to remain which may damage or interfere with the purpose of the easement.

4. Building Materials and Size Limitations. All building materials to be incorporated into and visible as a part of the external structure of any building or other structure in the Property conform to the following criteria:

4.1. Roofing material. In particular, all roofing material for any building or structure shall be of wood (shake or shingle), tile, or a 25-year or better composition architectural shake with ridge caps.

4.2. Siding material. All siding materials shall be natural wood, or man-made lap siding materials provided.

4.3. Minimum House Size. Each residence constructed on a Lot shall have a minimum floor area of 1,000 square feet, exclusive of garages.

5. Landscape, Hedges and Fences. All front and side yards must be completely landscaped within six (6) months of initial occupancy. All grounds and related structures shall be maintained in harmony with surrounding landscaping. No weeds, noxious plants, or unsightly vegetation shall be planted or allowed to grow. Fences shall comply with applicable City regulations but shall not exceed six(6) feet in height. Fences shall be well constructed of suitable materials and shall not detract from the appearance of the adjacent structures or buildings. No high output exterior lighting, including but not limited to mercury vapor and halide lights, shall be installed. No tree shall be removed except in accordance with City of Oregon City permit standards.

6. No Rezoning or Redivision. No property within the Property may be rezoned or

redivided, nor may a Lot line or boundary line of a Lot be altered, without the written consent of the City of Oregon City and a majority of Owners.

7. Restrictions on Animals. No animals of any kind shall be raised, bred or kept in the Property, except that dogs, cats and other commonly maintained household pets may be kept so long as they are not bred, maintained or kept for commercial purposes. No animal of any kind, including dogs and cats, shall be allowed to interfere with the quiet enjoyment of the other residents in the Property, or permitted untended upon the streets, or upon premises of other occupants of the Property.

8. No Commercial Use. No portion of property in the Property shall be used for business or commercial purposes. No occupant of property within the Property shall park, nor permit to be parked, any commercial vehicle such as log trucks, dump trucks, tractor trailer rigs, or any other vehicles except passenger automobiles (including pickups) upon property, including streets, in the Property. No owner or occupant shall permit, initiate, or carry on activities in the Property that are obnoxious or offensive, nor allow conditions on any Lot to become a nuisance or annoyance to the neighborhood. No commercial signs shall be erected on the property, except real estate sales signs of not more than five (5) square feet advertising property within the Property for sale or rent.

9. Screening. Trash, garbage and other waste shall not be kept except in sanitary containers, screened from public view. No Lot or Tract shall be used as a dumping ground for trash, garbage, waste or debris. All heat pumps and condensers on Lots (or other utilities and devices commonly placed out of doors) shall receive special consideration to provide visual screening and noise attenuation. All boats, trailers, recreational vehicles, equipment, campers and the like must be parked off streets of the Property in a garage or on a concrete pad beside a garage built specifically for the purpose.

10. No Interference. Owners or occupants within the Property shall not engage in nor continue uses which unreasonably interfere with use of other property within the Property. The following activities shall conclusively be deemed to unreasonably interfere with other property in the Property: (1) construction and maintenance of communications transmission and reception towers and antenna; and (2) construction and maintenance of exterior radio and television antennae and other receptors except for satellite dish type antennae not larger than 36 inches in diameter.

11. Completion of Improvements. All structures (including flat work and landscaping) constructed within the Property shall be erected and completed within one year after the commencement of construction. All remodeling, reconstruction, or enhancement of structures shall be completed within one year of the commencement of construction. Commencement of construction shall be deemed to be the date upon which a building permit was first issued for the construction, or, if no building permit was obtained, the date on which Lot clearing, demolition or remodeling commenced.

12. No Further Subdivision. No Lot may be subdivided or partitioned into divisions of any nature without City approval.

13. Mandatory Mediation Prior to Litigation. All Lot owners agree that all claims, controversies or disputes, whether they be statutory, contract and/or tort claims between or among the parties hereto which arise out of or are related to this Agreement, or which relate to the formation, interpretation, breach or invalidity of this Agreement, whether arising before, during or after termination (hereinafter collectively referred to as "Claims"), shall be resolved in accordance with the mediation and litigation procedures specified herein.

13.1 Mediation. All "Claims" defined in the foregoing paragraph shall be submitted to mediation. The parties shall agree to a mediator. If the parties cannot agree as to the selection of a mediator, then either party may request appointment of a mediator from the American Arbitration Association or the Arbitration Service of Portland, Inc., whichever organization is selected by the party which first initiates mediation by filing a claim in accordance with the filing rules of the organization selected. The parties shall share equally the cost of the mediation process.

13.2 Litigation and Attorney's Fees. Any "Claims" that have not been resolved by mediation may be the subject of litigation in which the parties shall have all rights and remedies available at law and in equity, and the prevailing party in such litigation shall be entitled to an award of attorneys' fees and costs of action at trial and on appeal and review.

13.3 Judgment. Judgment upon the award rendered pursuant to such arbitration may be entered in any court having jurisdiction thereof. The parties shall share equally the fees and costs charged by the arbitration entity. The parties knowingly and voluntarily waive their rights to have their dispute tried and adjudicated by a judge or jury. In the event a party fails to proceed with arbitration, unsuccessfully challenges the arbitrator's award, or fails to comply with the arbitrator's award, the other party is entitled to costs, including reasonable attorney's fees, for having to compel arbitration or defend or enforce the award.

13.4 Venue. The venue for any litigation to interpret or enforce the provisions hereof shall be Oregon City, Oregon. The parties expressly consent to the jurisdiction of such court.

14. Section and Paragraph Captions. Section and paragraph captions shall not be deemed to be a part of this Declaration unless the context otherwise requires. In construing this Declaration, if the context so requires, the singular shall be taken to mean and to include the plural, the masculine shall be taken to mean and to include the feminine and the neuter and, generally, all grammatical changes shall be made, assumed and implied to make the provisions hereof apply equally to individuals, trusts, estates, personal representative, trustees and corporations.

The undersigned Owner of the subject property has caused this Declaration to be executed this

_____ day of _____, 2017.

DECLARANT:

_____

Exhibit H: Transportation Impact Study

Wheeler Farms

Transportation Impact Study

Oregon City, Oregon

Date:
June 15, 2017

Prepared for:
Rian Park Development, Inc.

Prepared by:
Todd Mobley, PE
Richard Martin, EI

RENEWS: 12/31/2018

LANCASTER
ENGINEERING

321 SW 4th Ave., Suite 400 | Portland, OR 97204 | 503.248.0313 | lancasterengineering.com

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Executive Summary

1. A zone change from R10 to R8 is proposed for a site that consists of six tax lots, totalling approximately 22.56 acres. The site is located to the southeast of S Central Point Road, southwest of Hazeldell Avenue, and northeast of S White Lane. A subdivision is proposed under the R8 zoning that would accommodate 77 lots for construction of single-family homes.
2. The trip generation calculations show that the proposed subdivision is projected to generate a total of 57 trips during the morning peak hour and 76 trips during the evening peak hour. The change in zoning is expected to result in a potential net increase in trips of 8 during the morning peak hour and 11 during the evening peak hour.
3. For 2019 conditions with the proposed Wheeler Farms subdivision in place, all study area intersections are expected to operate acceptably and no mitigations are necessary to accommodate the proposed subdivision.
4. By 2035, all study-area intersections will continue to operate acceptably, with the exception of the signalized intersection of Warner-Parrott/Warner-Milne Road at Linn Avenue/Leland Road, which will operate slightly over capacity. However, the proposed zone change will not degrade the operation of the intersection, since the net increase in trips associated with the change in zoning is quite small. As such, the Transportation Planning Rule is satisfied and there is no significant effect on the surrounding transportation system.
5. Based on the detailed review of all of the crash data, no significant patterns and no contributing design concerns were identified at the study intersections. Accordingly, no safety mitigations are recommended.

Introduction

The proposed subdivision consists of the construction of 77 single-family detached houses. The project site is located immediately to the southeast of S Central Point Road, southwest of Hazeldell Avenue, and northeast of S White Lane at 19584 and 19532 Central Point Road in Oregon City, Oregon. The project site consists of tax lots 1001, 1291, 1100, 1180, 1700, and 1790 and encompasses an approximate total of 22.56 acres. All six lots are currently utilized for agricultural purposes with lot 1100 containing one single-family detached house and outbuildings.

The proposed subdivision will connect to five street stubs from adjacent subdivisions and connect these streets within the site, completing the local street system in the immediate vicinity. This improved connectivity will offer multiple travel routes to the neighborhood, distributing trips and avoiding concentrated traffic impacts. Wheeler Farms will have access to S Central Point Road via four street connections, including Hazeldell Avenue, Skellenger Way, Blanchet Drive, and White Lane. However, given the site location, street layout, and expected travel patterns, White Lane is not expected to carry any significant traffic from the project.

This report addresses the impacts of the proposed development on the nearby street system and includes safety and capacity / level-of-service analyses at the following five intersections:

1. S Central Point Road at Blanchet Drive
2. S Central Point Road at Skellenger Way
3. S Central Point Road at Hazeldell Avenue
4. S Central Point Road at Warner Parrott Road
5. Warner Milne Road at Linn Avenue/Leland Road

The purpose of the study is to determine whether the transportation system in the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses, and to determine any mitigation that might be necessary to do so.

Vicinity Streets

S Central Point Road is classified as a Collector by the City of Oregon City. The roadway has a two-lane cross-section southwest of Trade Wind Street, widening to a three-lane cross-section, with one standard travel lane in each direction and a center two-way left-turn lane northeast of Trade Wind Street. It has a posted speed of 45 mph southwest of and a posted speed of 35 mph northeast of Partlow Road. Partial bike lanes, curbs and sidewalks are in place between the project site and Warner Parrott Road, however these facilities are not continuous. Some on-street parking is also available along both sides of the roadway.

Warner Parrott Road is classified as a Minor Arterial by the City of Oregon City. The roadway has a two-lane cross-section and has a posted speed of 30 mph. Bike lanes are in place on both sides of the street. Partial curbs and sidewalks are provided along both sides of the roadway within the study area.

Warner Milne Road is classified as a Minor Arterial by the City of Oregon City. The roadway has a two-lane cross-section and has a posted speed of 30 mph. Bike lanes are in place on both sides of the street. Partial curbs and sidewalks are provided along both sides of the roadway within the site vicinity.

Skellenger Way is classified as a Local Street by the City of Oregon City. The roadway has a two-lane cross-section without centerline striping and has a posted speed of 25 mph. On-street parking is permitted along both sides of the roadway. Curbs and sidewalks are also provided along both sides of the roadway.

Linn Avenue is classified as a Minor Arterial by the City of Oregon City. The roadway has a two-lane cross-section and has a posted speed of 35 mph. Bike lanes are in place on both sides of the street. On-street parking is generally permitted along both sides of the roadway between Williams Street and Ethel Street. Curbs and sidewalks are provided along both sides of the roadway within the site vicinity.

Leland Road is classified as a Minor Arterial by the City of Oregon City. The roadway has a two-lane cross-section and has a posted speed of 35 mph. Bike lanes are in place on both sides of the street. Partial curbs and sidewalks are provided along the eastern side of the roadway within the site vicinity.

Study Intersections

The intersection of Warner Parrott Road at S Central Point Road is a three-legged intersection that is stop-controlled for the northeast bound approach of S Central Point Road. The northeast bound approach has one left-turn lane, one right-turn lane, and a bicycle lane to the right of the outermost standard travel lane. The northwest bound approach has one through lane, one left-turn lane, and a bicycle lane to the right of the outermost standard travel lane. The southeast bound approach has one through lane that feeds into the left-turn lane at the traffic signal at Leland Road/Linn Avenue, one shared through/right-turn lane, and a bicycle lane to the right of the outermost standard travel lane. The southwestern intersection leg has a marked crosswalk while all other intersection leg crosswalks are unmarked.

The intersection of Warner Parrott/Milne Road at Linn Avenue/Leland Road is a four-legged intersection that is controlled by a traffic signal. The north-, south-, and eastbound approaches each have one left-turn lane served by protected phasing, one shared through/right-turn lane, and a bicycle lane to the right of the outermost standard travel lane. The westbound approach of Warner Milne Road has one left-turn lane served by protected phasing, one through lane, one shared through/right-turn lane, and a bicycle lane to the right of the outermost standard travel lane. All four intersection legs have marked crosswalks.

The intersection of S Central Point Road and Blanchet Drive is a three-legged intersection that is stop-controlled for the northwest bound approach of Blanchet Drive. The northeast and southeast bound approaches each have one through/turn lane and parking is available on the southeast side of the street. S Central Point Road has a posted speed limit of 45 mph in both directions and Blanchet Drive has a posted speed limit of 25 mph at the intersection.

The intersection of S Central Point Road and Skellenger Way is a three-legged intersection that is stop-controlled for the southeast bound approach of Skellenger Way. The northeast and southeast bound approaches each have one through/turn lane and parking is available on the northwest side of the street. S Central Point Road has a posted speed limit of 45 mph in both directions and Skellenger Way has a posted speed limit of 25 mph at the intersection.

The intersection of S Central Point Road and S Hazeldell Avenue is a four-legged intersection that is stop-controlled for the northwest and southeast bound approaches of S Hazeldell Avenue. The northeast and southeast bound approaches each have one through/turn lane and parking is available on the southeast side of the street. S Central Point Road has a posted speed limit of 45 mph in both directions and S Hazeldell Avenue has a posted speed limit of 25 mph at the intersection. All four approaches have sidewalks and unmarked crosswalks.

A vicinity map displaying the project site, vicinity streets, and the study area intersections with their associated lane configurations is shown in Figure 1**Error! Reference source not found.** on page five.

Traffic Counts

Traffic counts were conducted at study area intersections on Wednesday, April 5th, 2017 from 7:00 AM to 9:00 AM and on Tuesday, April 4th, 2017 from 4:00 PM to 6:00 PM. Data from each intersection peak hour was used for analysis.

Figure 2 on page six shows the existing AM and PM peak hour traffic volumes for the study area intersections.

Transit

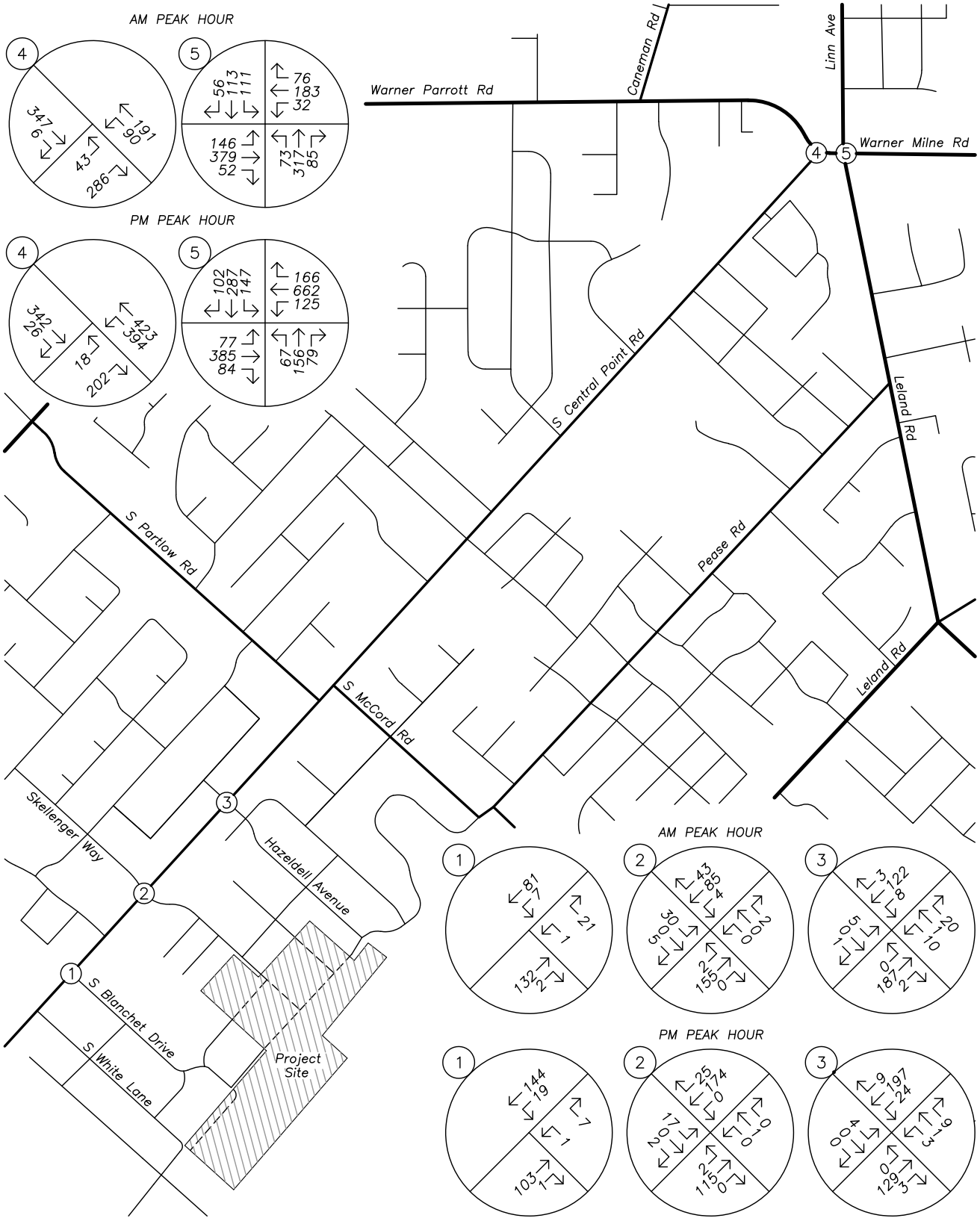
TriMet bus line *#33 – McLoughlin* operates along Warner Milne Road and Linn Avenue near the site vicinity, with the closest northbound/westbound and southbound/eastbound bus stops located approximately 1.35 miles from the project site. This route provides service between Portland City Center, the last stop at the intersection of NW 5th Avenue and NW Hoyt Street, and the Oregon City Transit Center/Clackamas Community College depending on the time of day. Weekday service is scheduled from approximately 4:30 AM to 1:45 AM, with headways of approximately 15 to 60 minutes. Saturday service is scheduled from approximately 5:45 AM to 1:30 AM with headways of about 15 to 60 minutes. Sunday service is scheduled from 6:00 AM to 1:30 AM with headways of approximately 15 to 60 minutes.

VICINITY MAP

no scale

FIGURE 1

PAGE 5



TRAFFIC VOLUMES
Existing Conditions
AM & PM Peak Hours

no scale

FIGURE 2

PAGE 6

Project-Generated Trips

Under the proposed R-8 zoning, the Wheeler Farms subdivision includes 77 single-family detached homes. There is currently one single-family home on the site that will be removed with site development. The sections below describe the methodology used to calculate the number of trips generated by the new homes and the way they are expected to use the transportation system in the project study area.

Trip Generation

To estimate the number of trips that will be generated by the proposed subdivision, trip rates from the *TRIP GENERATION MANUAL*[1] were used. Data from land-use code 210, *Single-Family Detached Housing*, was used to estimate the proposed development's trip generation based on the number of dwelling units.

The trip generation calculations show that the proposed subdivision is projected to generate a net increase of 57 trips during the morning peak hour and 76 trips during the evening peak hour. The trip generation estimates are summarized in Table 1 below. Detailed trip generation calculations are included in the technical appendix to this report.

Table 1: Subdivision Trip Generation Summary

	ITE		Morning Peak Hour			Evening Peak Hour			Weekday
	Code	Size	In	Out	Total	In	Out	Total	Total
Single-Family Detached Housing									
Proposed Development	210	77 units	15	43	58	49	28	77	734
Existing Development	210	1 unit	*0*	*-1*	*-1*	*-1*	*0*	*-1*	*-10*
Total		**83 units**	**15**	**42**	**57**	**48**	**28**	**76**	**724**

Because a change in zoning is proposed for the site, a comparison of the reasonable worst-case development potential under both the existing and proposed zoning designations is necessary to gauge the traffic impact that could occur due to the change. Under the existing R-10 zoning, approximately 73 dwelling units could be constructed. Under the proposed R-8 zone, approximately 84 dwelling units are possible, for a net increase of 11 homes. The comparative trip generation analysis for the zone change is shown in Table 2 below.

[1] Institute of Transportation Engineers (ITE), *TRIP GENERATION MANUAL, 9th Edition*, 2012

Table 2: Zone Change Trip Generation Summary

	ITE Code	Size	Morning Peak Hour In	Morning Peak Hour Out	Morning Peak Hour Total	Evening Peak Hour In	Evening Peak Hour Out	Evening Peak Hour Total	Weekday Total
Single-Family Detached Housing									
R-8 Zoning Potential	210	84 units	16	47	63	53	31	84	800
R-10 Zoning Potential	210	73 units	14	41	55	46	27	73	694
Potential Net Increase in Trips		**11 units**	**2**	**6**	**8**	**7**	**4**	**11**	**106**

Trip Distribution

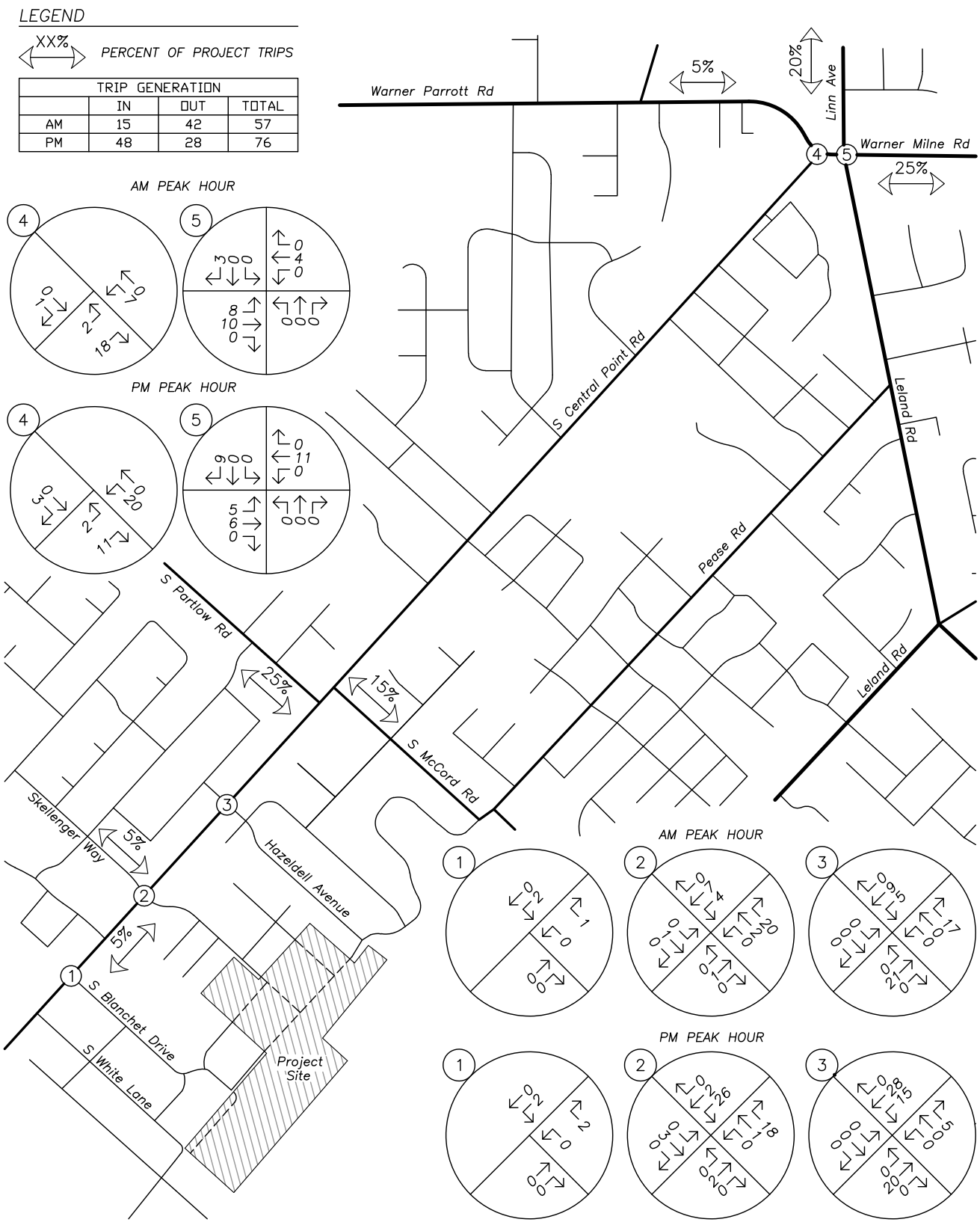
The directional distribution of site trips to and from the proposed development was estimated based on locations of likely trip destinations, locations of major transportation facilities in the site vicinity, and existing travel patterns at the study area intersections.

The following trip distribution was estimated and used for analysis:

- Approximately 25 percent of trips will travel to/from the east along Warner Milne Road.
- Approximately 25 percent of trips will travel to/from the northwest along S Partlow Road.
- Approximately 20 percent of trips will travel to/from the north along Linn Avenue.
- Approximately 15 percent of trips will travel to/from the southeast along S McCord Road.
- Approximately 5 percent of trips will travel to/from the west along Warner Parrott Road.
- Approximately 5 percent of trips will travel to/from the northwest along Skellenger Way.
- Approximately 5 percent of trips will travel to/from the southwest along S Central Point Road.

As described previously, there are three primary streets that the subdivision will use to reach S Central Point Road. Approximately one-third of site trips were assumed to utilize each access point along S Central Point Road at Skellenger Way, S Hazeldell Avenue, and Blanchet Drive.

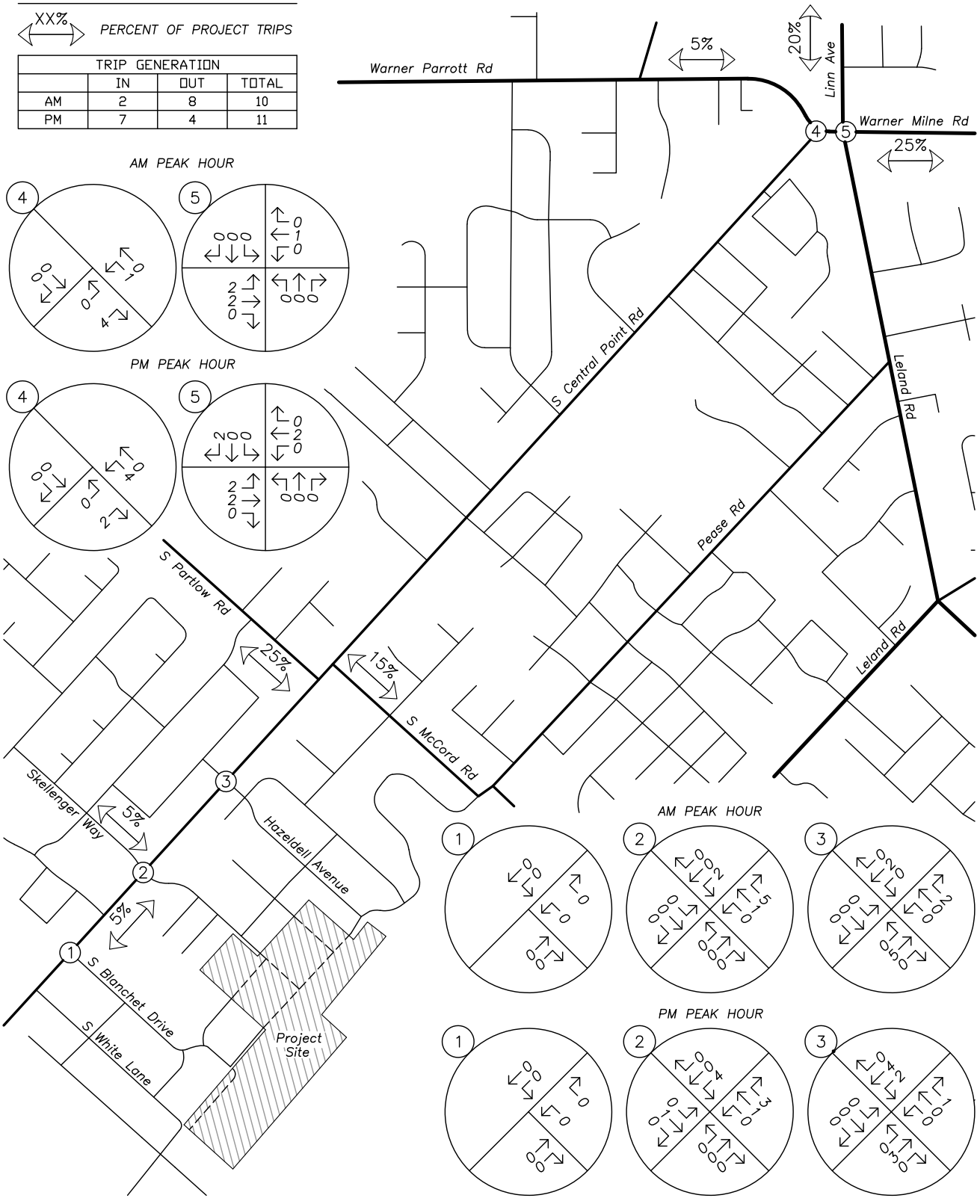
The trip assignment for the AM and PM peak hours for build out of the subdivision is shown in Figure 3 on page 9 and the assignment of the potential net increase in trips from the zone chage is shown in Figure 4 on page 10.



SITE TRIP DISTRIBUTION & ASSIGNMENT
Proposed Development Plan – Site Trips
AM & PM Peak Hours

no scale

FIGURE 3



ZONE CHANGE DISTRIBUTION & ASSIGNMENT
Net Increase in Trips from Zone Change
AM & PM Peak Hour

no scale

FIGURE 4

PAGE 10

Operational Analysis

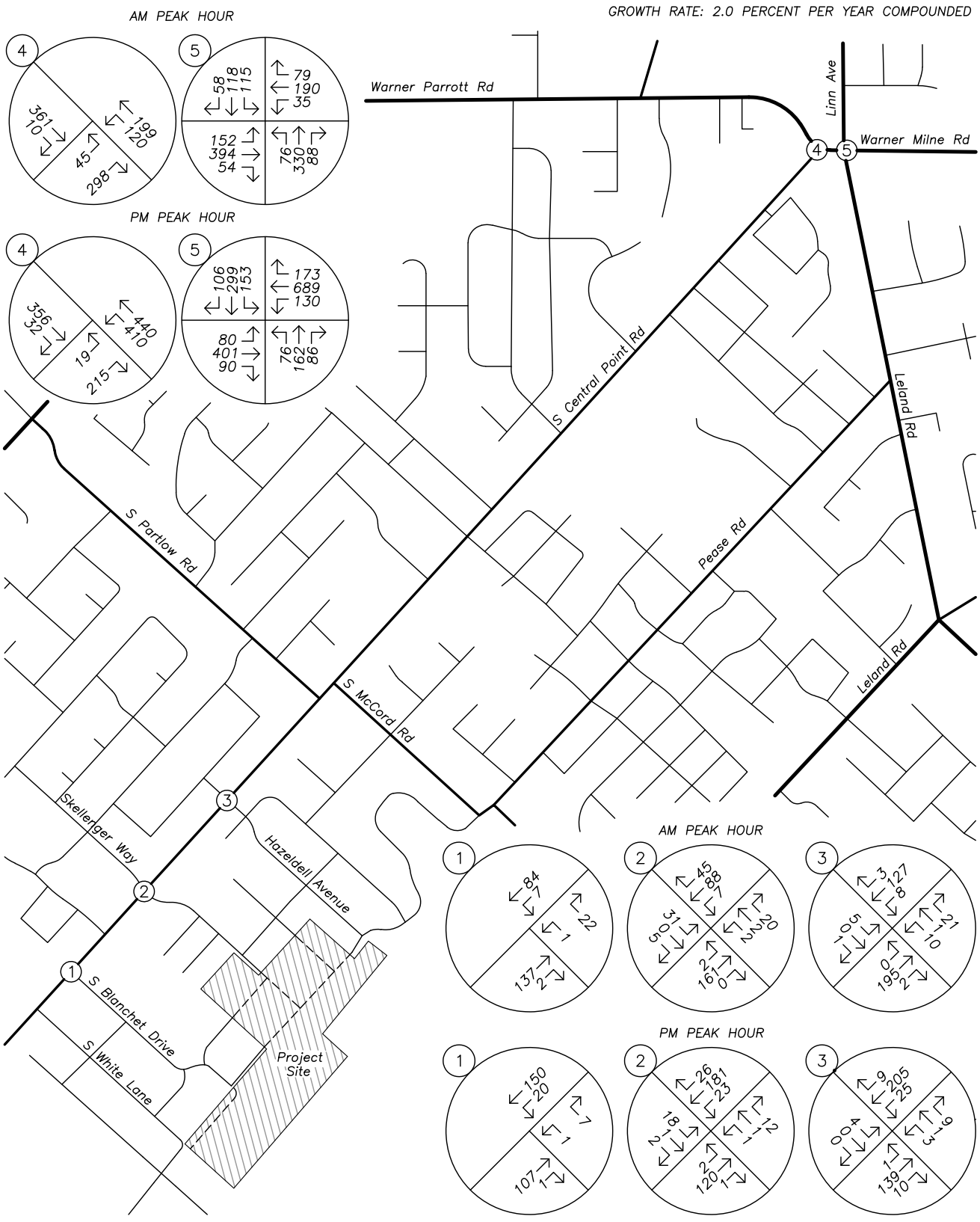
To gauge the operation of the study area intersections, an operational analysis was conducted. The following subsections describe how future traffic volumes were derived as well as the operation (level of service, delay, and volume-to-capacity ratio) of the study area intersections.

Background Traffic

To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. Growth in traffic voloumes was estimated based on data from the 2013 Transportation System Plan (TSP), which examines a base year of 2010 and a future year of 2035. Growth in the TSP averages a rate of two percent per year, which was applied to all intersection movements.

It was assumed that the proposed subdivision would be completed by 2019. In order to calculate traffic volumes in 2019 without the subdivision in place, a compounded growth rate of two percent per year was applied over a period of two years. In addition, trips from nearby and adjacent subdivisions that have been approved but are not yet built out were added. Year 2019 background volumes (conditions without the proposed subdivision) are shown in Figure 5 on page 12. Year 2019 conditions with the subdivision at build out are shown in Figure 6 on page 13.

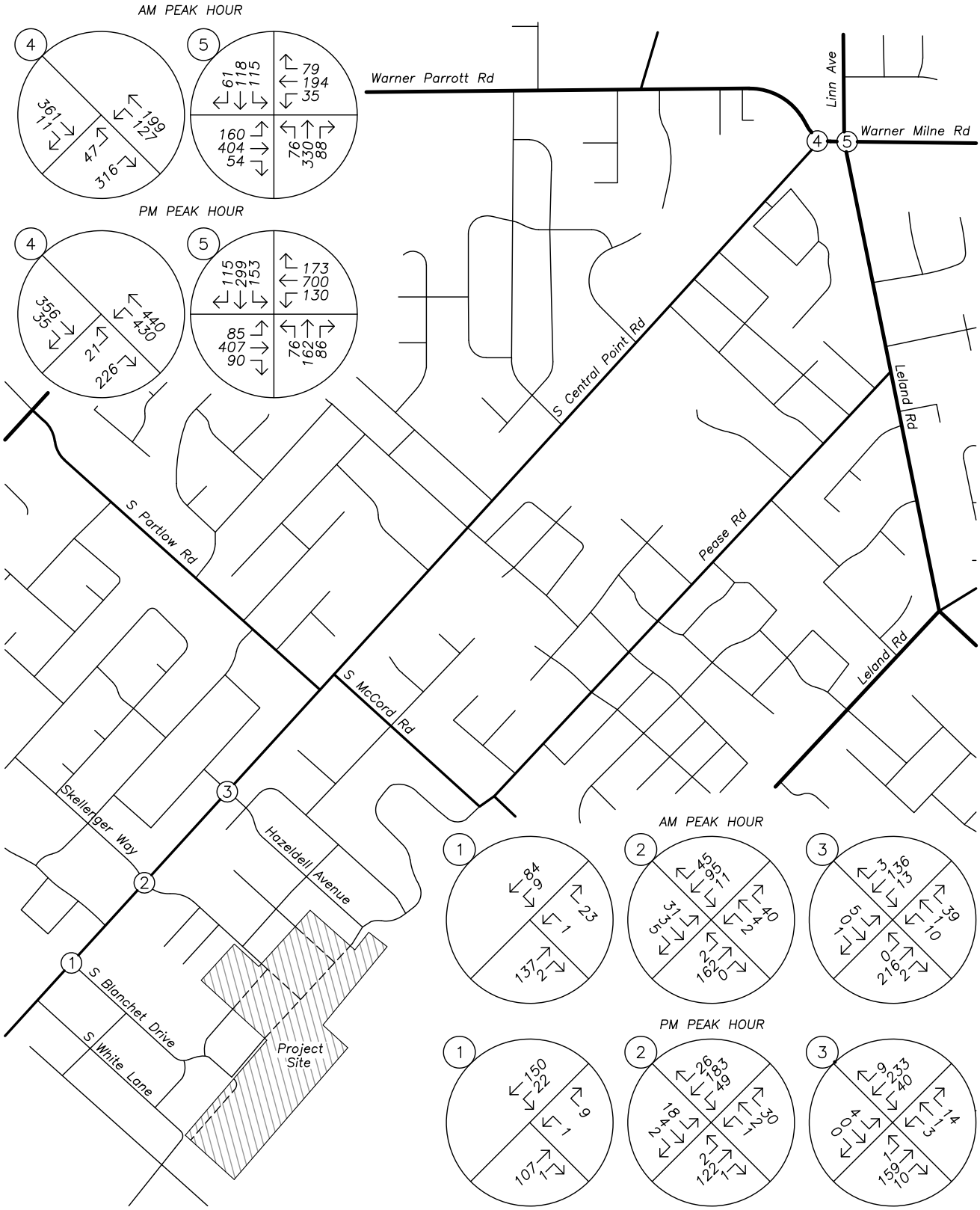
In order to assess the impacts of the proposed zone change on traffic conditions at the planning horizon, the existing traffic volumes at the study area intersections were increased to account for anticipated growth through year 2035. Background conditions for the year 2035, including development on the site under the existing zone, are shown in Figure 7 on page 14. Figure 8 of page 15 shows the sum of 2035 background conditions plus the net increase in trips from the zone change.



TRAFFIC VOLUMES
Year 2019 Background Conditions
AM & PM Peak Hours

no scale

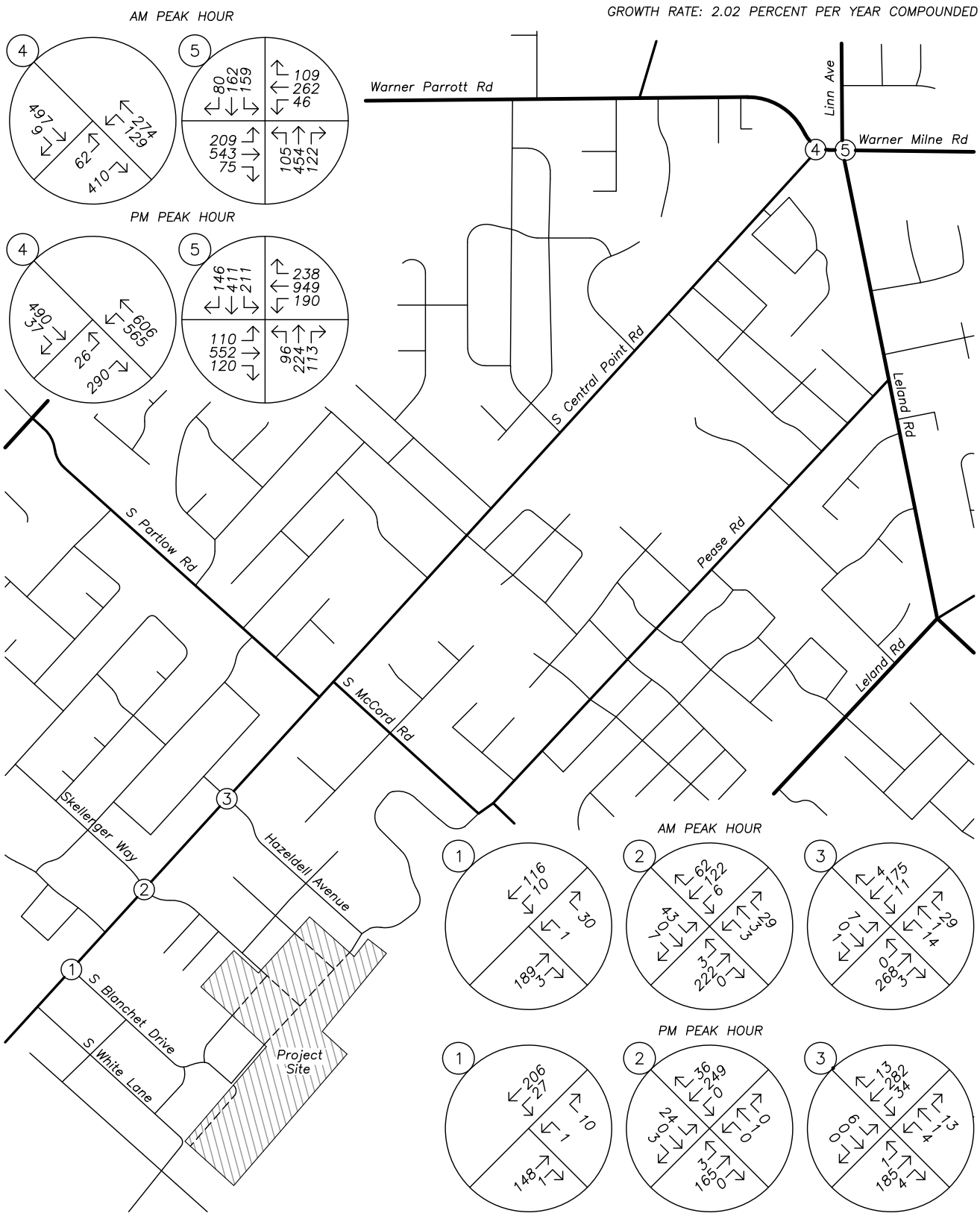
FIGURE 5



TRAFFIC VOLUMES
Year 2019 Background plus Site Trips
AM & PM Peak Hours

no scale

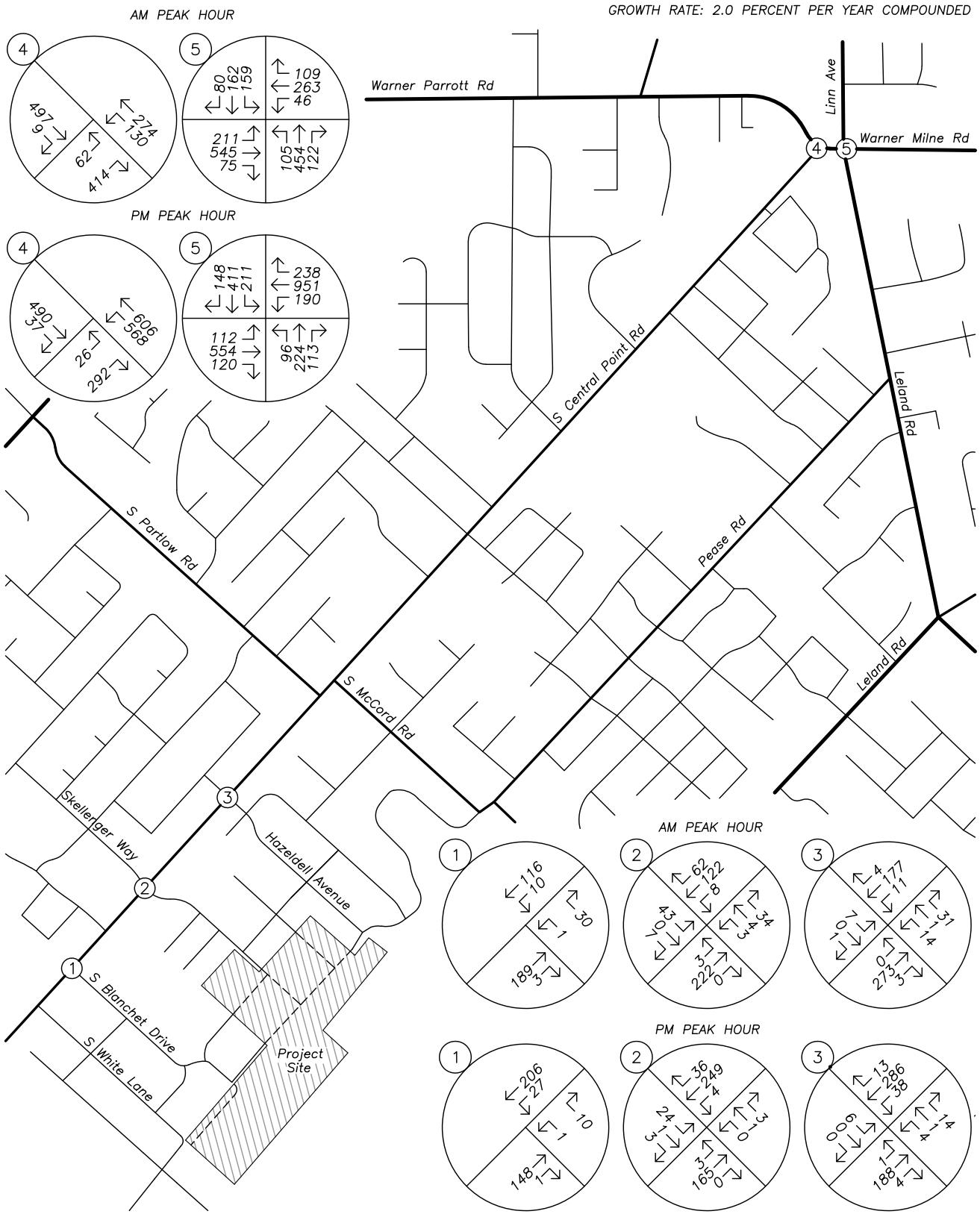
FIGURE 6



TRAFFIC VOLUMES
Year 2035 Background Conditions
AM & PM Peak Hour

no scale

FIGURE 7



TRAFFIC VOLUMES
Year 2035 Existing plus Net Increase in Trips
AM & PM Peak Hour

no scale

FIGURE 8

PAGE 15

Intersection Capacity and Level-of-Service Analysis

To determine the performance of the study intersections, a capacity analysis was conducted for the morning and evening peak hours for existing conditions, year 2019 background conditions, and year 2019 background plus site trips from the proposed development. The analysis was conducted according to the unsignalized and signalized intersection analysis methodologies given in the *HIGHWAY CAPACITY MANUAL* (HCM), published by the Transportation Research Board.

Intersections outside the Regional Center but designated on the Arterial and Throughway Network, as defined in the Regional Transportation Plan, shall operate with a v/c ratio of 0.99 or less. This standard applies to signalized intersections as a whole. For unsignalized intersections this standard applies to movements on the major street, whereas there is no performance standard for the minor street approach. The study intersections of Warner Parrott Road at S Central Point Road and Warner Parrott/Milne Road at Linn Avenue/Leland Road are subject to these standards.

For unsignalized intersections outside the Regional Center and not designated on the Arterial and Throughway Network, as defined in the Regional Transportation Plan, all movements serving more than 20 vehicles are required to operate at level of service (LOS) E or better during both the morning and evening peak hours, however LOS F is tolerated for movements serving 20 or less vehicles. Levels of service can range from LOS A, which indicates very little or no delay experience by vehicles, to LOS F, which indicates a high degree of congestion and delay. The intersections of Hazeldell Avenue, Skellenger Way, and Blanchet Drive with S Central Point Road are subject to these standards.

The intersection of S Central Point Road at Blanchet Drive currently operates at LOS A during both the morning and evening peak hours. The intersection is projected to operated at LOS A under all peak hour conditions, except for 2035 background plus zone change conditions, under which it will operate at LOS B.

The intersection of S Central Point Road at Skellenger Way currently operates at LOS B during both the morning and evening peak hours. The intersection is projected to operate at LOS B under all peak hour conditions, except for 2035 background and background plus zone change conditions. Under those conditions, the intersection is projected to operate at LOS C in the evening peak hour.

The intersection of S Central Point Road at Hazeldell Avenue currently operates at LOS B during both the morning and evening peak hours. It is projected to operate at LOS B under all potential peak hour conditions.

The intersection of Warner Parrott Road at S Central Point Road operates at LOS A during both the morning and evening peak hours, with a maximum V/C ratio of 0.36 for the westbound left turn movement. The intersection is projected to operate at LOS A during the morning peak hour and LOS B during the evening peak hour for all projections, with a maximum V/C ratio of 0.60 for the westbound left turn movement.

The intersection of Warner Parrott/Milne Road at Linn Avenue/Leland Road currently operates at LOS D during both the morning and evening peak hours, with a maximum V/C ratio of 0.82. Failure levels are seen under 2035 background and background plus zone change conditions in the morning and evening peak

hours. Under these conditions, the intersection is projected to operate at LOS E with a v/c ratio of 1.01 for both the morning and evening peak hours.

The results of the capacity analysis, along with the levels of service, delay, and v/c ratios are shown in Table 3. Detailed calculations, as well as tables showing the relationships between delay and level of service are included in the appendix to this report.

Based on the results of the operational analysis, all study area intersections will operating acceptably through 2019, even with the proposed development in place. It is important to note that because of the City of Oregon City's performance standard, the northbound stop-controlled approach on S Central Point Road is not subject to a level of service or v/c standard.

The intersection of Warner Milne Road/Warner Parrott Road at Linn Avenue/Leland Road is projected to operate above capacity by 2035, even without the proposed zone change. The proposed zone change has very little impact on operation of the intersection at the planning horizon, since the net increase in trips from the change in zoning is very low.

Also, Oregon City's TSP includes a potential future roundabout at the intersection of Warner Milne Road/Warner Parrott Road and Linn Avenue/Leland Road. This roundabout would mitigate the operation of the intersection and bring it into compliance with the applicable performance standard.

Table 3: Capacity and LOS Summary

	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
S Central Point Rd at Blanchet Drive						
Existing Conditions	A	10	0.06	A	9	0.02
2019 Background Conditions	A	9	0.03	A	9	0.02
2019 Background + Site Trips	A	9	0.03	A	9	0.02
2035 Background Conditions	A	10	0.05	A	10	0.02
2035 Background + Zone Change	A	10	0.04	A	9	0.02
S Central Point Rd at Skellenger Way						
Existing Conditions	B	11	0.07	B	12	0.04
2019 Background Conditions	B	12	0.08	B	12	0.05
2019 Background + Site Trips	B	12	0.10	B	14	0.07
2035 Background Conditions	B	14	0.14	B	13	0.07
2035 Background + Zone Change	B	14	0.14	B	13	0.07
S Central Point Rd at S Hazeldell Avenue						
Existing Conditions	B	11	0.06	B	12	0.04
2019 Background Conditions	B	12	0.06	B	12	0.02
2019 Background + Site Trips	B	13	0.10	B	14	0.03
2035 Background Conditions	B	14	0.10	C	15	0.03
2035 Background + Zone Change	B	14	0.10	C	15	0.04
S Central Point Rd at Warner Parrott Road*						
Existing Conditions	A	8	0.08	A	10	0.36
2019 Background Conditions	A	9	0.11	B	10	0.38
2019 Background + Site Trips	A	9	0.12	B	10	0.40
2035 Background Conditions	A	9	0.14	B	14	0.59
2035 Background + Zone Change	A	9	0.14	B	14	0.60
Warner Parrott/Milne Road at Linn Ave/Leland Road						
Existing Conditions	D	42	0.71	D	38	0.82
2019 Background Conditions	D	35	0.82	D	40	0.82
2019 Background + Site Trips	D	36	0.83	D	43	0.83
2035 Background Conditions	E	67	1.01	E	66	1.01
2035 Background + Zone Change	E	67	1.01	E	69	1.01

***Westbound left turn LOS, delay, and v/c are reported

Safety Analysis

Safety of the transportation system is related to the operations discussed in the previous section, but is a separate consideration. The safety of the roads and intersections within the project study area are addressed in the following subsection.

Crash Analysis

Using data obtained from ODOT's Crash Data Analysis and Reporting Unit, a review of the most recent available five years of crash history (2011 – 2015) at the study area intersections was performed. The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for the intersection. Crash rates provide the ability to compare relative safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak hour represents 10% of the average annual daily traffic (AADT) at the intersection. Crash rates more than 1.0 crashes per million entering vehicles (CMEV) may be indicative of safety hazards that should be further investigated and mitigated.

The intersections of S Central Point Road at Skellenger Way, Blanchet Drive, and Hazeldell Avenue had no reported crashes during the five-year analysis period.

The intersection of Warner Parrott Road at S Central Point Road had seven reported crashes during the analysis period. The crashes consisted of three turning-type collisions, two rear-end collisions, one backing collision, and one fixed-object collision. Of these reported crashes, four were classified as "Property Damage Only" (*PDO*), two as "Possible Injury – Complaint of Pain" (*Injury-C*), and one as "Non-Incapacitating Injury" (*Injury-B*). The crash rate at the intersection was calculated to be 0.27 CMEV.

The intersection of Warner Parrott/Milne Road at Linn Avenue/Leland Road had two reported crashes during the analysis period. The crashes consisted of one angle-type collision and one collision involving a pedestrian. Of these reported crashes one was classified as "Property Damage Only" (*PDO*) and one as "Non-Incapacitating Injury" (*Injury-B*). The crash rate at the intersection was calculated to be 0.04 CMEV.

Based on the detailed review of all the crash data, no significant patterns and no contributing design concerns were identified at the study intersections. Accordingly, no safety mitigations are recommended.

Transportation Planning Rule

The Transportation Planning Rule (TPR) is in place to ensure that the transportation system is capable of supporting possible increases in traffic intensity that could result from changes to adopted plans and land-use regulations. Because the proposed project includes a change in zoning, the TPR must be addressed. The applicable elements of the TPR are each quoted directly in *italics* below, with a response directly following.

Oregon Administrative Rule 660-12-0600

(1) If an amendment to a functional plan, an acknowledge comprehensive plan, or a land use regulation (including a zoning map) would significantly affect an existing or planned transportation facility, then the local government must put in place measures as provided in section (2) of the rule, unless the amendment is allowed under section (3), (9), or (10) of this rule. A plan or land use regulation amendment significantly affects a transportation facility if it would:

(a) Change the functional classification of an existing or planned transportation facility (exclusive of correction of map errors in an adopted plan;

(b) Change standards implementing a functional classification system; or

(c) Result in any of the effects listed in paragraphs (A) through (C) of this subsection based on projected conditions measured at the end of the planning period identified in the TSP. As part of evaluating projected conditions, the amount of traffic projected to be generated within the area of the amendment may be reduced if the amendment includes an enforceable, ongoing requirement that would demonstrably limit traffic generation, including, but not limited to, transportation demand management. This reduction may diminish or completely eliminate the significant effect of the amendment.

(A) Types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;

(B) Degrade the performance of an existing or planned transportation facility such that it would not meet the performance standards identified in the TSP or comprehensive plan; or

(C) Degrade the performance of an existing or planned transportation facility that is otherwise projected to not meet performance standards identified in the TSP or comprehensive plan.

In the case of this report, subsections (a) and (b) are not triggered, since the proposed zone change will not impact or alter the functional classification of any existing or planned facility and the proposal does not include a change to any functional classification standards.

Subsection (c) is also not triggered since the addition of the net increase in trips from the zone change will not degrade the performance of the one intersection in the project study area that is projected to not meet performance standards at the planning horizon.

The TPR is satisfied, since the proposed zone change does not significantly affect the transportation system.

Conclusions

For 2019 conditions, all study area intersections are expected to operate acceptably and no mitigations are necessary to accommodate the proposed 77-lot subdivision.

By 2035, all study-area intersections will continue to operate acceptably, with the exception of the signalized intersection of Warner-Parrott/Warner-Milne Road at Linn Avenue/Leland Road, which will operate slightly over capacity. However, the proposed zone change will not degrade the operation of the intersection, since the net increase in trips associated with the change in zoning is quite small. As such, the Transportation Planning Rule is satisfied and there is no significant effect on the surrounding transportation system.

Appendix

SCALE 1" = 80 FEET
SCALE AT HALF SIZE (11"x17") 1" = 160 FEET
DATE: 04/17/2017

NOTES:
1. INFORMATION SHOWN IS BASED ON A VARIETY OF SOURCES, INCLUDING GEOGRAPHIC INFORMATION SYSTEMS (GIS), AERIAL PHOTOGRAPHS, AS-BUILT INFORMATION, AND TAX ASSESSOR MAP INFORMATION.
2. DIMENSIONS SHOWN ARE APPROXIMATE.

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ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

WHEELER FARMS

OREGON CITY, OREGON
TAX LOTS 1700, 1100, 1291, 1001, 1790, 1180 CLACKAMAS CO. TAX MAPS 3S2E07C, 3S1E12D

PRELIMINARY SUBDIVISION LAYOUT

DESIGNED BY:
DRAWN BY:
CHECKED BY: MBH
SCALE: AS NOTED
DATE: 05/16/2017

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

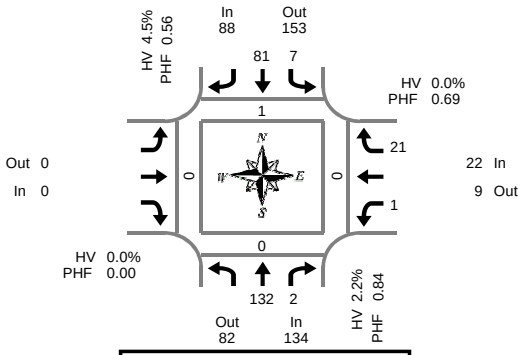
JOB NUMBER 5621

SHEET 2

AKS DRAWING FILE: 5621 NEIGHBOR PLANS.DWG | LAYOUT: 2

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Central Point Rd & Blanchet Dr

Wednesday, April 05, 2017
7:00 AM to 9:00 AM

Peak Hour Summary
7:15 AM to 8:15 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
7:00 AM	3	0	0		1	3		0				0	0		1	0	8	0	0	0	0
7:05 AM	2	0	0		1	4		0				0	0		1	0	8	0	0	0	0
7:10 AM	6	0	0		0	6		0				0	0		2	0	14	0	0	0	0
7:15 AM	15	0	0		0	4		0				0	0		1	0	20	0	0	0	0
7:20 AM	8	0	0		0	6		0				0	0		2	0	16	0	0	0	0
7:25 AM	8	0	0		0	4		0				0	1		1	0	14	0	0	0	0
7:30 AM	13	1	0		2	4		0				0	0		3	0	23	0	0	0	0
7:35 AM	8	0	0		0	1		0				0	0		2	0	11	0	0	0	0
7:40 AM	12	1	0		1	9		0				0	0		3	0	26	0	0	0	0
7:45 AM	16	0	0		0	7		0				0	0		3	0	26	0	0	0	0
7:50 AM	11	0	0		1	12		0				0	0		0	0	24	1	0	0	0
7:55 AM	13	0	0		1	12		1				0	0		0	0	26	0	0	0	0
8:00 AM	9	0	0		1	12		0				0	0		0	0	22	0	0	0	0
8:05 AM	5	0	0		0	5		0				0	0		2	0	12	0	0	0	0
8:10 AM	14	0	0		1	5		0				0	0		4	0	24	0	0	0	0
8:15 AM	7	0	0		0	4		0				0	0		0	0	11	0	0	0	0
8:20 AM	9	0	0		1	7		0				0	0		0	0	17	0	0	0	0
8:25 AM	9	0	0		0	4		0				0	0		0	0	13	0	0	0	0
8:30 AM	2	0	0		1	7		0				0	0		0	0	10	0	0	0	0
8:35 AM	7	0	0		0	8		0				0	0		1	0	16	0	0	2	0
8:40 AM	7	0	0		0	2		0				0	0		2	0	11	0	0	0	0
8:45 AM	7	0	0		1	4		0				0	0		1	0	13	0	0	0	0
8:50 AM	10	0	0		2	9		0				0	0		1	0	22	0	0	0	0
8:55 AM	8	0	0		1	4		0				0	0		1	0	14	0	0	0	0
Total Survey	209	2	0		15	143		1				0	1		31	0	401	1	0	2	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
7:00 AM	11	0	0		2	13		0				0	0		4	0	30	0	0	0	0
7:15 AM	31	0	0		0	14		0				0	1		4	0	50	0	0	0	0
7:30 AM	33	2	0		3	14		0				0	0		8	0	60	0	0	0	0
7:45 AM	40	0	0		2	31		1				0	0		3	0	76	1	0	0	0
8:00 AM	28	0	0		2	22		0				0	0		6	0	58	0	0	0	0
8:15 AM	25	0	0		1	15		0				0	0		0	0	41	0	0	0	0
8:30 AM	16	0	0		1	17		0				0	0		3	0	37	0	0	2	0
8:45 AM	25	0	0		4	17		0				0	0		3	0	49	0	0	0	0
Total Survey	209	2	0		15	143		1				0	1		31	0	401	1	0	2	0

Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	134	82	216	0	88	153	241	1	0	0	0	0	22	9	31	0	244	1	0	0	0
%HV	2.2%				4.5%				0.0%				0.0%				2.9%				
PHF	0.84				0.56				0.00				0.69				0.80				

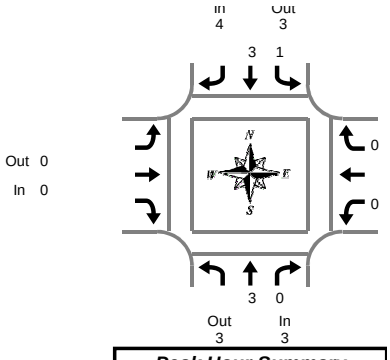
By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Total
	T	R	Total		L	T		Total				Total	L		R	Total	
Volume	132	2	134		7	81		88				0	1		21	22	244
%HV	NA	2.3%	0.0%	2.2%	14.3%	3.7%	NA	4.5%	NA	NA	NA	0.0%	0.0%	NA	0.0%	0.0%	2.9%
PHF		0.83	0.25	0.84	0.58	0.56		0.56				0.00	0.25		0.66	0.69	0.80

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
7:00 AM	115	2	0		7	72		1				0	1		19	0	216	1	0	0	0
7:15 AM	132	2	0		7	81		1				0	1		21	0	244	1	0	0	0
7:30 AM	126	2	0		8	82		1				0	0		17	0	235	1	0	0	0
7:45 AM	109	0	0		6	85		1				0	0		12	0	212	1	0	2	0
8:00 AM	94	0	0		8	71		0				0	0		12	0	185	0	0	2	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Central Point Rd & Blanchet Dr

Wednesday, April 05, 2017
7:00 AM to 9:00 AM

Peak Hour Summary
7:15 AM to 8:15 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
7:00 AM		0	0	0	0	0		0				0	0		0	0	0
7:05 AM		0	0	0	0	0		0				0	0		0	0	0
7:10 AM		0	0	0	0	0		0				0	0		0	0	0
7:15 AM		0	0	0	0	0		0				0	0		0	0	0
7:20 AM		0	0	0	0	0		0				0	0		0	0	0
7:25 AM		1	0	1	0	0		0				0	0		0	0	1
7:30 AM		0	0	0	1	0		1				0	0		0	0	1
7:35 AM		1	0	1	0	0		0				0	0		0	0	1
7:40 AM		0	0	0	0	0		0				0	0		0	0	0
7:45 AM		0	0	0	0	1		1				0	0		0	0	1
7:50 AM		0	0	0	0	0		0				0	0		0	0	0
7:55 AM		0	0	0	0	0		0				0	0		0	0	0
8:00 AM		0	0	0	0	1		1				0	0		0	0	1
8:05 AM		0	0	0	0	0		0				0	0		0	0	0
8:10 AM		1	0	1	0	1		1				0	0		0	0	2
8:15 AM		0	0	0	0	0		0				0	0		0	0	0
8:20 AM		1	0	1	1	1		2				0	0		0	0	3
8:25 AM		0	0	0	0	0		0				0	0		0	0	0
8:30 AM		0	0	0	0	0		0				0	0		0	0	0
8:35 AM		0	0	0	0	2		2				0	0		0	0	2
8:40 AM		1	0	1	0	0		0				0	0		0	0	1
8:45 AM		0	0	0	0	0		0				0	0		0	0	0
8:50 AM		0	0	0	0	0		0				0	0		0	0	0
8:55 AM		1	0	1	0	0		0				0	0		0	0	1
Total Survey		6	0	6	2	6		8				0	0		0	0	14

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
7:00 AM		0	0	0	0	0		0				0	0		0	0	0
7:15 AM		1	0	1	0	0		0				0	0		0	0	1
7:30 AM		1	0	1	1	0		1				0	0		0	0	2
7:45 AM		0	0	0	0	1		1				0	0		0	0	1
8:00 AM		1	0	1	0	2		2				0	0		0	0	3
8:15 AM		1	0	1	1	1		2				0	0		0	0	3
8:30 AM		1	0	1	0	2		2				0	0		0	0	3
8:45 AM		1	0	1	0	0		0				0	0		0	0	1
Total Survey		6	0	6	2	6		8				0	0		0	0	14

Heavy Vehicle Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound Central Point Rd			Southbound Central Point Rd			Eastbound Blanchet Dr			Westbound Blanchet Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	3	6	4	3	7	0	0	0	0	1	1	7
PHF	0.38			0.50			0.00			0.00			0.58

By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Total
		T	R	Total	L	T		Total				Total	L		R	Total	
Volume		3	0	3	1	3		4				0	0		0	0	7
PHF		0.38	0.00	0.38	0.25	0.38		0.50				0.00	0.00		0.00	0.00	0.58

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

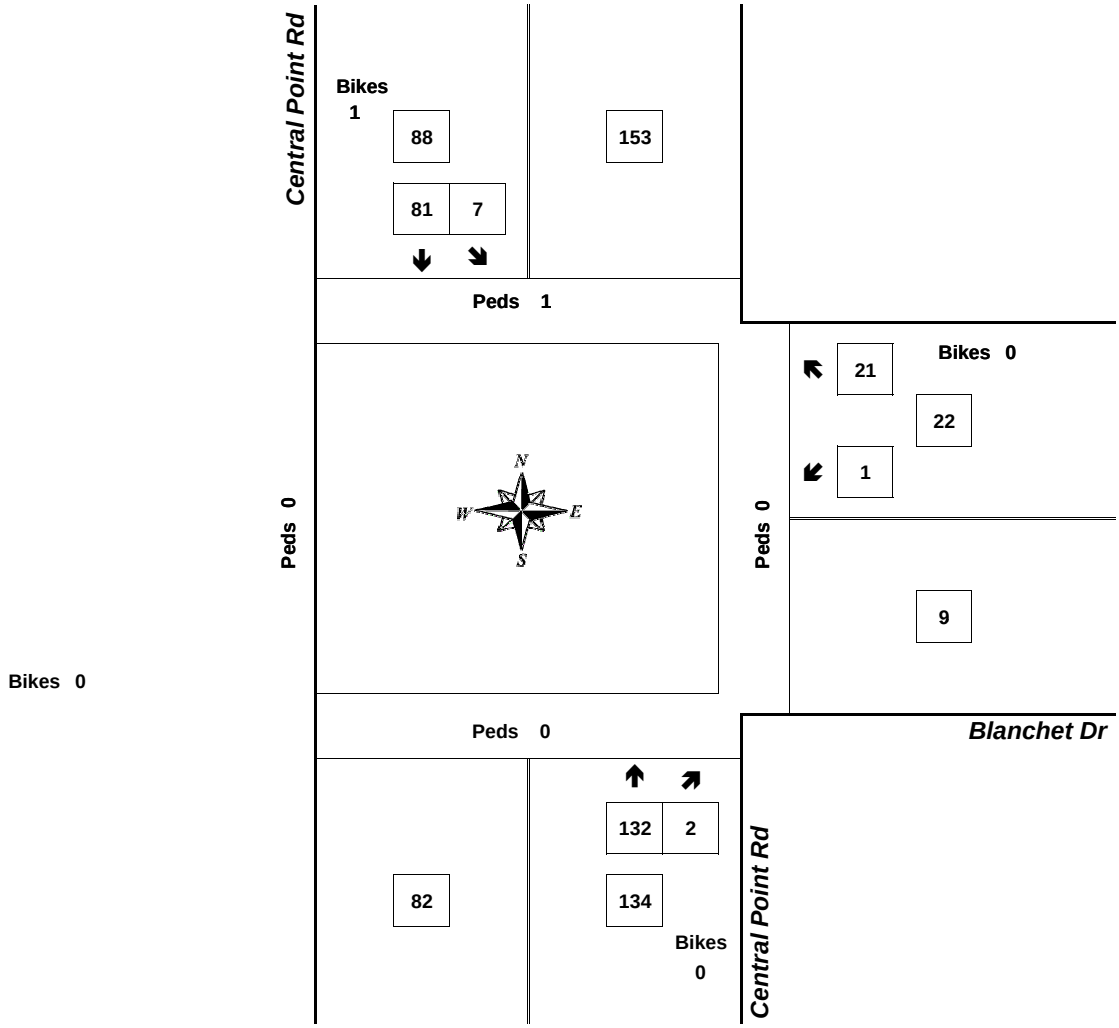
Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
7:00 AM		2	0	2	1	1		2				0	0		0	0	4
7:15 AM		3	0	3	1	3		4				0	0		0	0	7
7:30 AM		3	0	3	2	4		6				0	0		0	0	9
7:45 AM		3	0	3	1	6		7				0	0		0	0	10
8:00 AM		4	0	4	1	5		6				0	0		0	0	10

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Central Point Rd & Blanchet Dr

7:15 AM to 8:15 AM
Wednesday, April 05, 2017

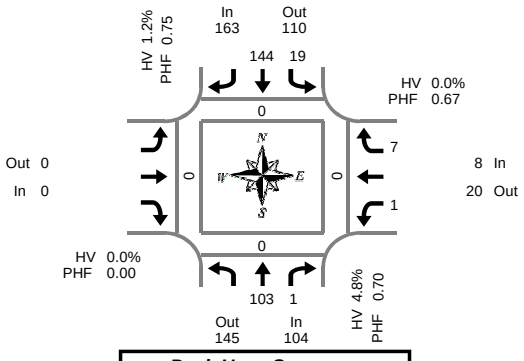


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.69	0.0%	22
NB	0.84	2.2%	134
SB	0.56	4.5%	88
Intersection	0.80	2.9%	244

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:55 PM to 5:55 PM

Central Point Rd & Blanchet Dr

Tuesday, April 04, 2017
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM	4	1	0		0	8		0				0	0		1	0	14	0	0	0	0
4:05 PM	5	0	0		1	12		0				0	1		0	0	19	0	0	0	0
4:10 PM	6	0	1		1	7		1				0	0		0	0	14	0	0	0	0
4:15 PM	11	0	0		0	9		0				0	0		1	0	21	0	0	0	0
4:20 PM	3	0	0		1	10		0				0	0		0	0	14	0	0	0	0
4:25 PM	4	0	0		0	14		0				0	0		0	0	18	0	0	0	0
4:30 PM	7	0	0		1	6		0				0	0		0	0	14	0	0	0	0
4:35 PM	6	0	0		0	11		0				0	0		0	0	17	0	0	0	0
4:40 PM	11	0	0		2	9		0				0	0		0	0	22	0	0	0	0
4:45 PM	6	0	0		0	6		0				0	0		0	0	12	0	0	0	0
4:50 PM	7	0	0		2	2		0				0	0		0	0	11	0	0	0	0
4:55 PM	8	0	0		2	16		0				0	0		0	0	26	0	0	0	0
5:00 PM	5	0	0		0	10		0				0	0		2	0	17	0	0	0	0
5:05 PM	14	0	2		2	4		0				0	0		1	0	21	0	0	0	0
5:10 PM	10	0	0		5	14		0				0	0		0	0	29	0	0	0	0
5:15 PM	13	0	0		0	9		0				0	1		1	0	24	0	0	0	0
5:20 PM	6	0	0		3	20		0				0	0		0	0	29	0	0	0	0
5:25 PM	11	0	0		1	5		0				0	0		1	0	18	0	0	0	0
5:30 PM	7	0	0		2	9		0				0	0		2	0	20	0	0	0	0
5:35 PM	9	1	0		0	7		0				0	0		0	0	17	0	0	0	0
5:40 PM	9	0	0		0	14		0				0	0		0	0	23	0	0	0	0
5:45 PM	5	0	0		2	16		0				0	0		0	0	23	0	0	0	0
5:50 PM	6	0	0		2	20		0				0	0		0	0	28	0	0	0	0
5:55 PM	3	0	0		2	8		0				0	0		0	0	13	0	0	1	0
Total Survey	176	2	3		29	246		1				0	2		9	0	464	0	0	1	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM	15	1	1		2	27		1				0	1		1	0	47	0	0	0	0
4:15 PM	18	0	0		1	33		0				0	0		1	0	53	0	0	0	0
4:30 PM	24	0	0		3	26		0				0	0		0	0	53	0	0	0	0
4:45 PM	21	0	0		4	24		0				0	0		0	0	49	0	0	0	0
5:00 PM	29	0	2		7	28		0				0	0		3	0	67	0	0	0	0
5:15 PM	30	0	0		4	34		0				0	1		2	0	71	0	0	0	0
5:30 PM	25	1	0		2	30		0				0	0		2	0	60	0	0	0	0
5:45 PM	14	0	0		6	44		0				0	0		0	0	64	0	0	1	0
Total Survey	176	2	3		29	246		1				0	2		9	0	464	0	0	1	0

Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	104	145	249	2	163	110	273	0	0	0	0	0	8	20	28	0	275	0	0	0	0
%HV	4.8%				1.2%				0.0%				0.0%				2.5%				
PHF	0.70				0.75				0.00				0.67				0.84				

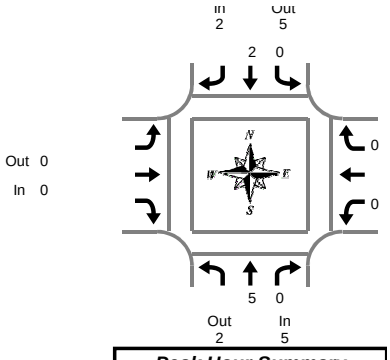
By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Total
	T	R	Total		L	T		Total				Total	L		R	Total	
Volume	103	1	104		19	144		163				0	1		7	8	275
%HV	NA	4.9%	0.0%	4.8%	0.0%	1.4%	NA	1.2%	NA	NA	NA	0.0%	0.0%	NA	0.0%	0.0%	2.5%
PHF		0.70	0.25	0.70	0.59	0.72		0.75				0.00	0.25		0.58	0.67	0.84

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM	78	1	1		10	110		1				0	1		2	0	202	0	0	0	0
4:15 PM	92	0	2		15	111		0				0	0		4	0	222	0	0	0	0
4:30 PM	104	0	2		18	112		0				0	1		5	0	240	0	0	0	0
4:45 PM	105	1	2		17	116		0				0	1		7	0	247	0	0	0	0
5:00 PM	98	1	2		19	136		0				0	1		7	0	262	0	0	1	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Central Point Rd & Blanchet Dr

Tuesday, April 04, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:55 PM to 5:55 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
4:00 PM		0	0	0	0	0		0				0	0		0	0	0
4:05 PM		0	0	0	0	0		0				0	1		0	1	1
4:10 PM		0	0	0	0	2		2				0	0		0	0	2
4:15 PM		0	0	0	0	0		0				0	0		0	0	0
4:20 PM		0	0	0	0	1		1				0	0		0	0	1
4:25 PM		1	0	1	0	1		1				0	0		0	0	2
4:30 PM		0	0	0	0	0		0				0	0		0	0	0
4:35 PM		0	0	0	0	1		1				0	0		0	0	1
4:40 PM		0	0	0	0	0		0				0	0		0	0	0
4:45 PM		0	0	0	0	1		1				0	0		0	0	1
4:50 PM		0	0	0	0	0		0				0	0		0	0	0
4:55 PM		1	0	1	0	0		0				0	0		0	0	1
5:00 PM		1	0	1	0	0		0				0	0		0	0	1
5:05 PM		0	0	0	0	0		0				0	0		0	0	0
5:10 PM		0	0	0	0	1		1				0	0		0	0	1
5:15 PM		0	0	0	0	0		0				0	0		0	0	0
5:20 PM		0	0	0	0	0		0				0	0		0	0	0
5:25 PM		2	0	2	0	0		0				0	0		0	0	2
5:30 PM		0	0	0	0	0		0				0	0		0	0	0
5:35 PM		1	0	1	0	0		0				0	0		0	0	1
5:40 PM		0	0	0	0	0		0				0	0		0	0	0
5:45 PM		0	0	0	0	0		0				0	0		0	0	0
5:50 PM		0	0	0	0	1		1				0	0		0	0	1
5:55 PM		0	0	0	0	0		0				0	0		0	0	0
Total Survey		6	0	6	0	8		8				0	1		0	1	15

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
4:00 PM		0	0	0	0	2		2				0	1		0	1	3
4:15 PM		1	0	1	0	2		2				0	0		0	0	3
4:30 PM		0	0	0	0	1		1				0	0		0	0	1
4:45 PM		1	0	1	0	1		1				0	0		0	0	2
5:00 PM		1	0	1	0	1		1				0	0		0	0	2
5:15 PM		2	0	2	0	0		0				0	0		0	0	2
5:30 PM		1	0	1	0	0		0				0	0		0	0	1
5:45 PM		0	0	0	0	1		1				0	0		0	0	1
Total Survey		6	0	6	0	8		8				0	1		0	1	15

Heavy Vehicle Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound Central Point Rd			Southbound Central Point Rd			Eastbound Blanchet Dr			Westbound Blanchet Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	5	2	7	2	5	7	0	0	0	0	0	0	7
PHF	0.42			0.50			0.00			0.00			0.58

By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Total
		T	R	Total	L	T		Total				Total	L		R	Total	
Volume		5	0	5	0	2		2				0	0		0	0	7
PHF		0.42	0.00	0.42	0.00	0.50		0.50				0.00	0.00		0.00	0.00	0.58

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

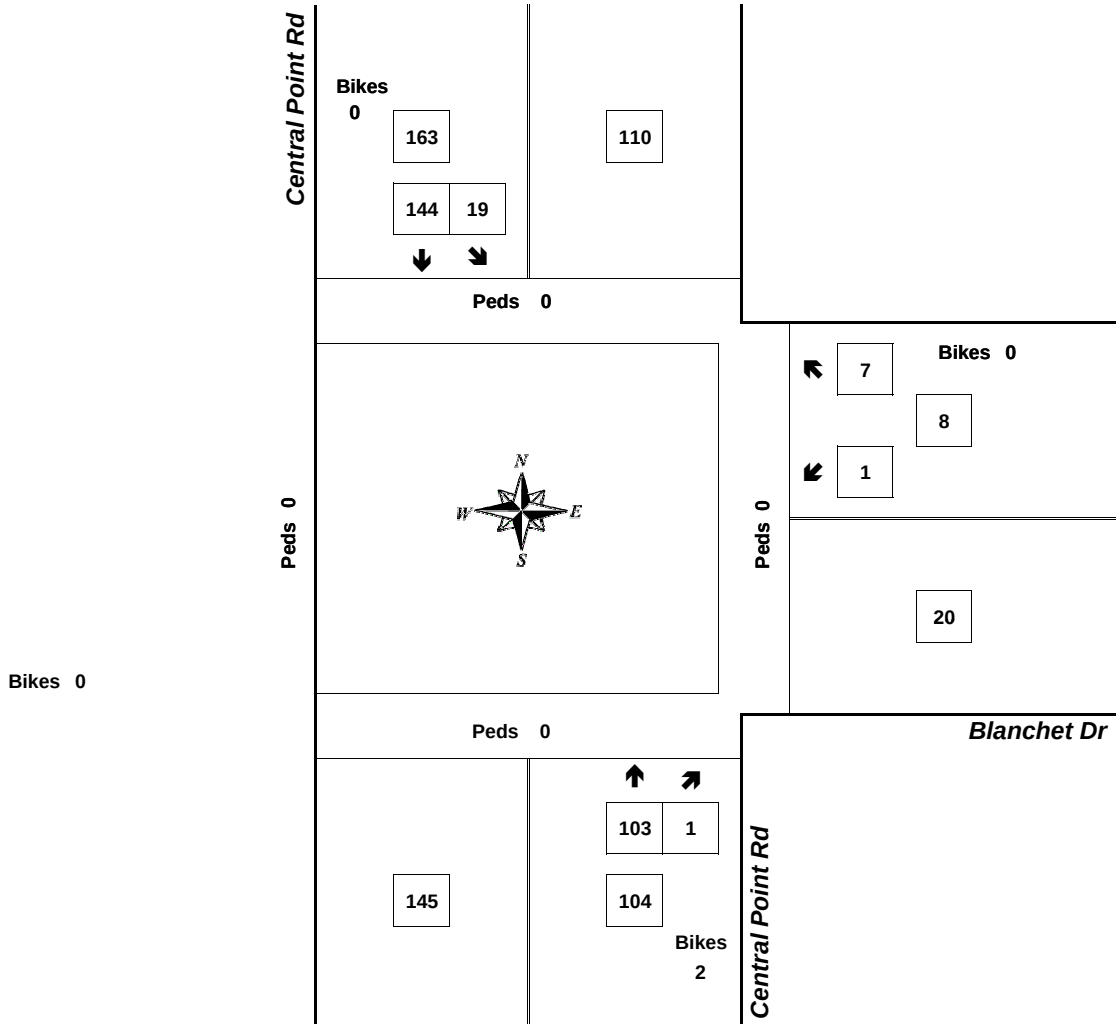
Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Blanchet Dr				Westbound Blanchet Dr				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
4:00 PM		2	0	2	0	6		6				0	1		0	1	9
4:15 PM		3	0	3	0	5		5				0	0		0	0	8
4:30 PM		4	0	4	0	3		3				0	0		0	0	7
4:45 PM		5	0	5	0	2		2				0	0		0	0	7
5:00 PM		4	0	4	0	2		2				0	0		0	0	6

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Central Point Rd & Blanchet Dr

4:55 PM to 5:55 PM
Tuesday, April 04, 2017

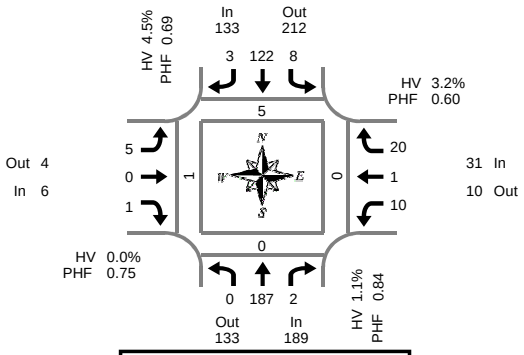


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.67	0.0%	8
NB	0.70	4.8%	104
SB	0.75	1.2%	163
Intersection	0.84	2.5%	275

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:15 AM to 8:15 AM

Central Point Rd & Hazeldell Ave

Wednesday, April 05, 2017
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	7	0	0	1	4	1	0	2	0	0	0	0	0	1	0	16	0	0	0	0
7:05 AM	0	8	0	0	1	6	0	0	0	0	0	0	0	0	2	0	17	0	0	0	0
7:10 AM	0	15	0	0	0	9	0	0	2	0	0	0	0	0	0	0	26	0	0	0	0
7:15 AM	0	20	0	0	1	5	0	0	0	0	0	0	1	0	1	0	28	0	0	0	0
7:20 AM	0	15	0	0	1	9	0	0	1	0	0	0	0	0	1	0	27	0	0	0	0
7:25 AM	0	14	0	0	0	6	0	0	0	0	0	0	0	0	1	0	21	0	0	0	0
7:30 AM	0	16	0	0	3	13	0	0	1	0	0	0	2	0	3	0	38	1	0	0	0
7:35 AM	0	15	1	0	0	7	0	0	1	0	0	0	1	0	1	0	26	0	0	0	0
7:40 AM	0	17	1	0	1	23	1	0	0	0	0	0	1	0	3	0	47	1	0	0	0
7:45 AM	0	22	0	0	0	5	0	0	0	0	0	0	5	0	2	0	34	0	0	0	0
7:50 AM	0	13	0	0	1	14	1	0	1	0	0	0	0	0	2	0	32	0	0	0	0
7:55 AM	0	16	0	0	0	17	1	0	0	0	0	0	0	0	0	0	34	0	0	0	1
8:00 AM	0	10	0	0	1	11	0	0	0	0	0	0	0	0	2	0	24	1	0	0	0
8:05 AM	0	10	0	0	0	3	0	0	0	0	1	0	0	0	1	0	15	2	0	0	0
8:10 AM	0	19	0	0	0	9	0	0	1	0	0	0	0	1	3	0	33	0	0	0	0
8:15 AM	0	9	0	0	0	5	0	0	3	0	0	0	0	0	2	0	19	0	0	0	0
8:20 AM	0	12	0	0	1	12	1	0	1	0	0	0	0	0	0	0	27	0	0	0	0
8:25 AM	0	7	1	0	0	5	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0
8:30 AM	0	5	0	0	0	9	0	0	0	0	0	0	0	0	2	0	16	0	0	0	0
8:35 AM	0	11	0	0	0	10	0	0	0	0	0	0	0	0	2	0	23	0	0	0	0
8:40 AM	0	9	0	0	0	5	0	0	0	0	0	0	0	0	1	0	15	0	0	0	0
8:45 AM	0	10	0	0	1	10	0	0	0	0	0	0	0	0	1	0	22	0	0	0	0
8:50 AM	0	15	0	0	1	9	0	0	0	0	0	0	0	0	2	0	27	0	0	0	1
8:55 AM	0	10	0	0	1	7	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0
Total Survey	0	305	3	0	14	213	5	0	13	0	1	0	10	1	33	0	598	5	0	0	2

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	30	0	0	2	19	1	0	4	0	0	0	0	0	3	0	59	0	0	0	0
7:15 AM	0	49	0	0	2	20	0	0	1	0	0	0	1	0	3	0	76	0	0	0	0
7:30 AM	0	48	2	0	4	43	1	0	2	0	0	0	4	0	7	0	111	2	0	0	0
7:45 AM	0	51	0	0	1	36	2	0	1	0	0	0	5	0	4	0	100	0	0	0	1
8:00 AM	0	39	0	0	1	23	0	0	1	0	1	0	0	1	6	0	72	3	0	0	0
8:15 AM	0	28	1	0	1	22	1	0	4	0	0	0	0	0	2	0	59	0	0	0	0
8:30 AM	0	25	0	0	0	24	0	0	0	0	0	0	0	0	5	0	54	0	0	0	0
8:45 AM	0	35	0	0	3	26	0	0	0	0	0	0	0	0	3	0	67	0	0	0	1
Total Survey	0	305	3	0	14	213	5	0	13	0	1	0	10	1	33	0	598	5	0	0	2

Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	189	133	322	0	133	212	345	0	6	4	10	0	31	10	41	0	359	5	0	0	1
%HV	1.1%				4.5%				0.0%				3.2%				2.5%				
PHF	0.84				0.69				0.75				0.60				0.79				

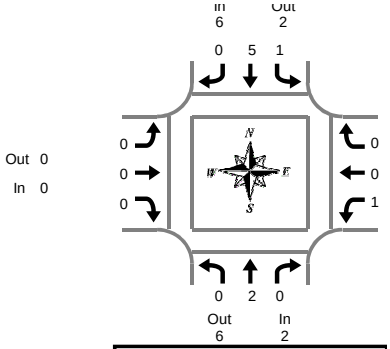
By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	187	2	189	8	122	3	133	5	0	1	6	10	1	20	31	359
%HV	0.0%	1.1%	0.0%	1.1%	12.5%	4.1%	0.0%	4.5%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	3.2%	2.5%
PHF	0.00	0.87	0.25	0.84	0.50	0.71	0.38	0.69	0.63	0.00	0.25	0.75	0.36	0.25	0.71	0.60	0.79

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	178	2	0	9	118	4	0	8	0	0	0	10	0	17	0	346	2	0	0	1
7:15 AM	0	187	2	0	8	122	3	0	5	0	1	0	10	1	20	0	359	5	0	0	1
7:30 AM	0	166	3	0	7	124	4	0	8	0	1	0	9	1	19	0	342	5	0	0	1
7:45 AM	0	143	1	0	3	105	3	0	6	0	1	0	5	1	17	0	285	3	0	0	1
8:00 AM	0	127	1	0	5	95	1	0	5	0	1	0	0	1	16	0	252	3	0	0	1

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Central Point Rd & Hazeldell Ave

Wednesday, April 05, 2017
7:00 AM to 9:00 AM

Peak Hour Summary
7:15 AM to 8:15 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:25 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
7:30 AM	0	0	0	0	1	1	0	2	0	0	0	0	1	0	0	1	3
7:35 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:10 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
8:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:20 AM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:35 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
8:40 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	5	0	5	1	9	0	10	0	0	0	0	1	0	0	1	16

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
7:30 AM	0	0	0	0	1	2	0	3	0	0	0	0	1	0	0	1	4
7:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
8:00 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
8:15 AM	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	4
8:30 AM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	5	0	5	1	9	0	10	0	0	0	0	1	0	0	1	16

Heavy Vehicle Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound Central Point Rd			Southbound Central Point Rd			Eastbound Hazeldell Ave			Westbound Hazeldell Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	6	8	6	2	8	0	0	0	1	1	2	9
PHF	0.50			0.38			0.00			0.25			0.38

By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	2	0	2	1	5	0	6	0	0	0	0	1	0	0	1	9
PHF	0.00	0.50	0.00	0.50	0.25	0.42	0.00	0.38	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.25	0.38

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

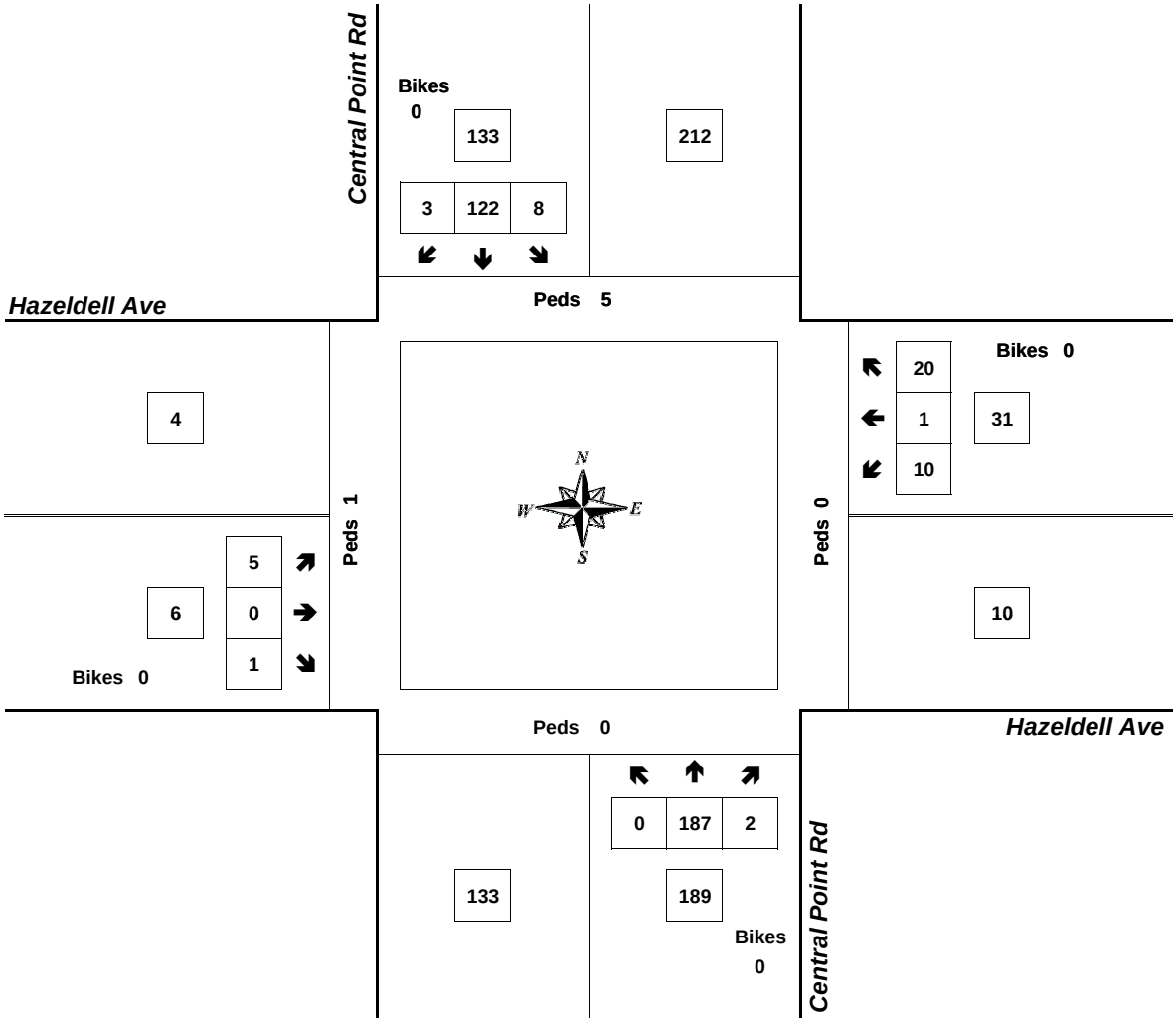
Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	1	0	1	1	4	0	5	0	0	0	0	1	0	0	1	7
7:15 AM	0	2	0	2	1	5	0	6	0	0	0	0	1	0	0	1	9
7:30 AM	0	3	0	3	1	6	0	7	0	0	0	0	1	0	0	1	11
7:45 AM	0	4	0	4	0	6	0	6	0	0	0	0	0	0	0	0	10
8:00 AM	0	4	0	4	0	5	0	5	0	0	0	0	0	0	0	0	9

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Central Point Rd & Hazeldell Ave

7:15 AM to 8:15 AM
Wednesday, April 05, 2017

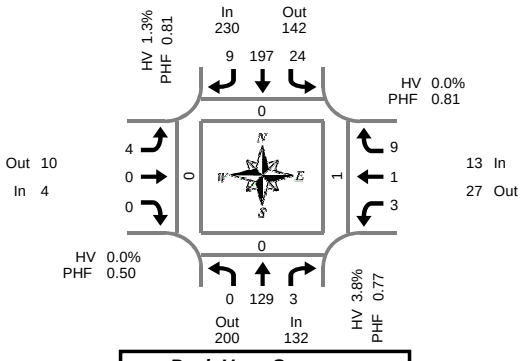


Approach	PHF	HV%	Volume
EB	0.75	0.0%	6
WB	0.60	3.2%	31
NB	0.84	1.1%	189
SB	0.69	4.5%	133
Intersection	0.79	2.5%	359

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:55 PM to 5:55 PM

Central Point Rd & Hazeldell Ave

Tuesday, April 04, 2017
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	7	0	0	0	11	1	0	2	0	0	0	0	0	0	0	21	0	0	0	0
4:05 PM	0	6	0	0	2	16	0	1	0	0	0	0	0	0	0	0	24	0	0	0	0
4:10 PM	0	7	0	1	1	11	0	0	1	0	0	0	1	0	0	0	21	0	0	0	0
4:15 PM	0	0	0	0	1	18	1	0	0	0	0	0	0	0	0	0	20	0	0	0	0
4:20 PM	0	5	0	0	2	10	0	0	0	0	0	0	0	1	0	0	18	0	0	0	0
4:25 PM	0	5	0	0	3	20	0	0	0	0	0	0	0	0	3	0	31	0	0	0	0
4:30 PM	0	7	0	0	2	12	1	0	0	0	0	0	0	0	1	0	23	0	0	0	0
4:35 PM	0	9	0	0	2	15	0	0	1	1	0	0	0	0	1	0	29	0	0	0	0
4:40 PM	0	11	0	0	4	15	1	0	0	0	0	0	0	0	0	0	31	0	0	0	0
4:45 PM	0	8	0	0	1	6	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0
4:50 PM	1	6	1	0	3	9	0	0	0	0	0	0	0	0	2	0	22	0	0	0	0
4:55 PM	0	13	0	0	1	21	1	0	2	0	0	0	0	0	0	0	38	0	0	0	0
5:00 PM	0	10	0	0	1	12	3	0	0	0	0	0	0	0	2	0	28	0	0	0	0
5:05 PM	0	16	0	0	0	10	3	0	0	0	0	0	0	0	0	0	29	0	0	0	0
5:10 PM	0	10	0	0	2	25	0	1	0	0	0	0	1	0	1	0	39	0	0	0	0
5:15 PM	0	17	0	0	3	14	0	0	0	0	0	0	0	1	0	0	35	0	0	0	0
5:20 PM	0	9	0	0	4	23	0	0	1	0	0	0	0	0	1	0	38	0	0	0	0
5:25 PM	0	12	0	0	2	10	0	0	0	0	0	0	0	0	1	0	25	0	0	0	0
5:30 PM	0	9	1	0	2	10	0	0	1	0	0	0	1	0	1	0	25	0	0	0	0
5:35 PM	0	9	1	0	3	13	0	0	0	0	0	0	0	0	0	0	26	0	0	0	0
5:40 PM	0	9	0	0	0	19	0	0	0	0	0	0	0	0	0	0	28	0	0	0	0
5:45 PM	0	9	0	0	3	16	1	0	0	0	0	0	0	0	1	0	30	0	0	0	0
5:50 PM	0	6	1	0	3	24	1	0	0	0	0	0	1	0	2	0	38	0	0	1	0
5:55 PM	0	4	0	0	1	10	0	0	1	0	0	0	0	0	0	0	16	0	0	0	0
Total Survey	1	204	4	1	46	350	13	2	9	1	0	0	4	2	16	0	650	0	0	1	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	20	0	1	3	38	1	1	3	0	0	0	1	0	0	0	66	0	0	0	0
4:15 PM	0	10	0	0	6	48	1	0	0	0	0	0	0	1	3	0	69	0	0	0	0
4:30 PM	0	27	0	0	8	42	2	0	1	1	0	0	0	0	2	0	83	0	0	0	0
4:45 PM	1	27	1	0	5	36	1	0	2	0	0	0	0	0	2	0	75	0	0	0	0
5:00 PM	0	36	0	0	3	47	6	1	0	0	0	0	1	0	3	0	96	0	0	0	0
5:15 PM	0	38	0	0	9	47	0	0	1	0	0	0	0	1	2	0	98	0	0	0	0
5:30 PM	0	27	2	0	5	42	0	0	1	0	0	0	1	0	1	0	79	0	0	0	0
5:45 PM	0	19	1	0	7	50	2	0	1	0	0	0	1	0	3	0	84	0	0	1	0
Total Survey	1	204	4	1	46	350	13	2	9	1	0	0	4	2	16	0	650	0	0	1	0

Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	132	200	332	0	230	142	372	1	4	10	14	0	13	27	40	0	379	0	0	1	0
%HV	3.8%				1.3%				0.0%				0.0%				2.1%				
PHF	0.77				0.81				0.50				0.81				0.85				

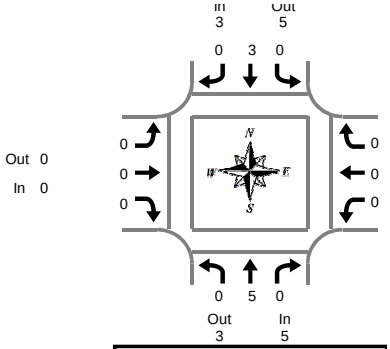
By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	129	3	132	24	197	9	230	4	0	0	4	3	1	9	13	379
%HV	0.0%	3.9%	0.0%	3.8%	0.0%	1.5%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%
PHF	0.00	0.75	0.38	0.77	0.67	0.79	0.32	0.81	0.50	0.00	0.00	0.50	0.75	0.25	0.75	0.81	0.85

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	1	84	1	1	22	164	5	1	6	1	0	0	1	1	7	0	293	0	0	0	0
4:15 PM	1	100	1	0	22	173	10	1	3	1	0	0	1	1	10	0	323	0	0	0	0
4:30 PM	1	128	1	0	25	172	9	1	4	1	0	0	1	1	9	0	352	0	0	0	0
4:45 PM	1	128	3	0	22	172	7	1	4	0	0	0	2	1	8	0	348	0	0	0	0
5:00 PM	0	120	3	0	24	186	8	1	3	0	0	0	3	1	9	0	357	0	0	1	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Central Point Rd & Hazeldell Ave

Tuesday, April 04, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:55 PM to 5:55 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:05 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:10 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:20 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:25 PM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:50 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	7	0	7	1	7	0	8	0	0	0	0	0	0	0	0	15

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	0	3	0	3	0	0	0	0	0	0	0	0	4
4:15 PM	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	2
4:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
4:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
5:15 PM	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
5:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Survey	0	7	0	7	1	7	0	8	0	0	0	0	0	0	0	0	15

Heavy Vehicle Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound Central Point Rd			Southbound Central Point Rd			Eastbound Hazeldell Ave			Westbound Hazeldell Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	5	3	8	3	5	8	0	0	0	0	0	0	8
PHF	0.42			0.38			0.00			0.00			0.67

By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	5	0	5	0	3	0	3	0	0	0	0	0	0	0	0	8
PHF	0.00	0.42	0.00	0.42	0.00	0.38	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

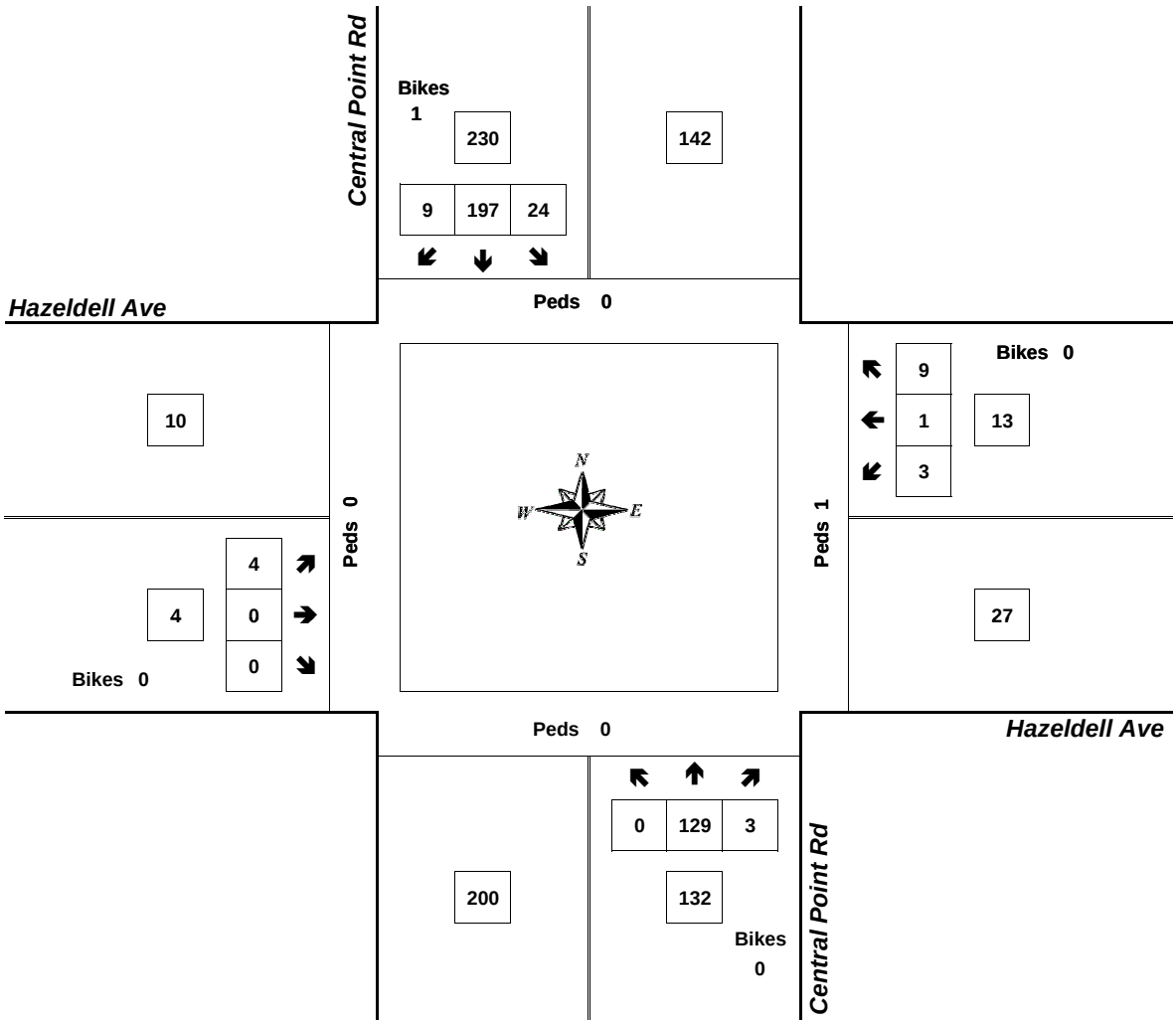
Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Hazeldell Ave				Westbound Hazeldell Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	3	0	3	1	4	0	5	0	0	0	0	0	0	0	0	8
4:15 PM	0	2	0	2	1	3	0	4	0	0	0	0	0	0	0	0	6
4:30 PM	0	4	0	4	0	3	0	3	0	0	0	0	0	0	0	0	7
4:45 PM	0	5	0	5	0	2	0	2	0	0	0	0	0	0	0	0	7
5:00 PM	0	4	0	4	0	3	0	3	0	0	0	0	0	0	0	0	7

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Central Point Rd & Hazeldell Ave

4:55 PM to 5:55 PM
Tuesday, April 04, 2017

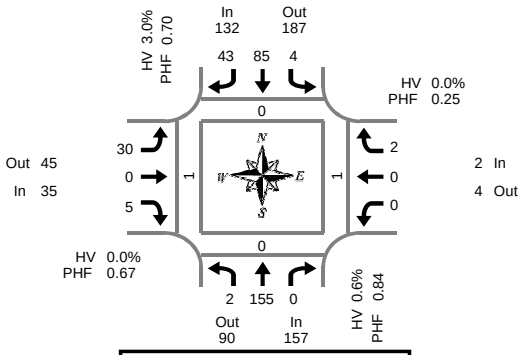


Approach	PHF	HV%	Volume
EB	0.50	0.0%	4
WB	0.81	0.0%	13
NB	0.77	3.8%	132
SB	0.81	1.3%	230
Intersection	0.85	2.1%	379

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Central Point Rd & Skellenger Way

Wednesday, April 05, 2017
7:00 AM to 9:00 AM

Peak Hour Summary
7:10 AM to 8:10 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	3	0	0	0	3	1	0	5	0	1	0	0	0	0	0	13	0	0	0	0
7:05 AM	0	6	0	0	0	6	0	0	0	0	0	0	0	0	1	0	13	0	0	0	0
7:10 AM	0	10	0	0	0	6	2	0	7	0	1	0	0	0	0	0	26	0	0	0	0
7:15 AM	0	16	0	0	0	5	2	0	3	0	0	0	0	0	0	0	26	0	0	0	0
7:20 AM	0	12	0	0	0	8	1	0	2	0	0	0	0	0	0	0	23	0	0	0	0
7:25 AM	0	12	0	0	1	4	1	0	2	0	0	0	0	0	0	0	20	0	0	0	0
7:30 AM	0	17	0	0	2	6	7	0	0	0	0	0	0	0	0	0	32	0	0	0	0
7:35 AM	0	13	0	0	0	1	7	0	2	0	0	0	0	0	0	0	23	0	0	0	0
7:40 AM	0	16	0	0	0	10	12	0	2	0	1	0	0	0	0	0	41	0	0	0	0
7:45 AM	2	16	0	0	0	7	3	0	6	0	1	0	0	0	0	0	35	0	0	0	0
7:50 AM	0	10	0	0	0	11	4	0	2	0	1	0	0	0	0	0	28	0	0	0	1
7:55 AM	0	15	0	0	0	14	3	0	1	0	0	0	0	0	1	0	34	0	0	0	0
8:00 AM	0	8	0	0	1	9	1	0	2	0	0	0	0	0	0	0	21	0	0	0	0
8:05 AM	0	10	0	0	0	4	0	0	1	0	1	0	0	0	1	0	17	0	0	1	0
8:10 AM	0	16	0	0	0	8	1	0	0	0	0	0	0	0	0	0	25	0	0	3	0
8:15 AM	0	8	0	0	0	3	2	0	2	0	0	0	0	0	0	0	15	0	0	0	0
8:20 AM	0	10	0	0	0	10	2	0	1	0	0	0	0	0	0	0	23	0	0	0	0
8:25 AM	0	9	0	0	0	4	1	0	1	0	0	0	0	0	0	0	15	0	0	0	0
8:30 AM	0	2	0	0	0	9	0	0	1	0	1	0	0	0	0	0	13	0	0	0	0
8:35 AM	0	9	0	0	0	8	3	0	2	0	0	0	0	0	0	0	22	0	0	0	0
8:40 AM	0	10	0	0	0	4	1	0	0	0	0	0	0	0	0	0	15	0	0	0	0
8:45 AM	0	7	0	0	0	7	2	0	2	0	0	0	0	0	0	0	18	0	0	0	0
8:50 AM	0	12	0	0	0	8	0	0	3	0	0	0	0	0	0	0	23	0	0	0	0
8:55 AM	1	8	0	0	0	5	1	0	1	0	0	0	0	0	1	0	17	0	0	0	0
Total Survey	3	255	0	0	4	160	57	0	48	0	7	0	0	0	4	0	538	0	0	4	1

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	19	0	0	0	15	3	0	12	0	2	0	0	0	1	0	52	0	0	0	0
7:15 AM	0	40	0	0	1	17	4	0	7	0	0	0	0	0	0	0	69	0	0	0	0
7:30 AM	0	46	0	0	2	17	26	0	4	0	1	0	0	0	0	0	96	0	0	0	0
7:45 AM	2	41	0	0	0	32	10	0	9	0	2	0	0	0	1	0	97	0	0	0	1
8:00 AM	0	34	0	0	1	21	2	0	3	0	1	0	0	0	1	0	63	0	0	4	0
8:15 AM	0	27	0	0	0	17	5	0	4	0	0	0	0	0	0	0	53	0	0	0	0
8:30 AM	0	21	0	0	0	21	4	0	3	0	1	0	0	0	0	0	50	0	0	0	0
8:45 AM	1	27	0	0	0	20	3	0	6	0	0	0	0	0	1	0	58	0	0	0	0
Total Survey	3	255	0	0	4	160	57	0	48	0	7	0	0	0	4	0	538	0	0	4	1

Peak Hour Summary
7:10 AM to 8:10 AM

By Approach	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	157	90	247	0	132	187	319	0	35	45	80	0	2	4	6	0	326	0	0	1	1
%HV	0.6%				3.0%				0.0%				0.0%				1.5%				
PHF	0.84				0.70				0.67				0.25				0.78				

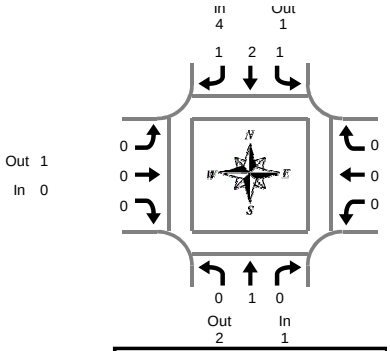
By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	155	0	157	4	85	43	132	30	0	5	35	0	0	2	2	326
%HV	0.0%	0.6%	0.0%	0.6%	25.0%	2.4%	2.3%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%
PHF	0.25	0.84	0.00	0.84	0.33	0.63	0.41	0.70	0.63	0.00	0.42	0.67	0.00	0.00	0.25	0.25	0.78

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	2	146	0	0	3	81	43	0	32	0	5	0	0	0	2	0	314	0	0	0	1
7:15 AM	2	161	0	0	4	87	42	0	23	0	4	0	0	0	2	0	325	0	0	4	1
7:30 AM	2	148	0	0	3	87	43	0	20	0	4	0	0	0	2	0	309	0	0	4	1
7:45 AM	2	123	0	0	1	91	21	0	19	0	4	0	0	0	2	0	263	0	0	4	1
8:00 AM	1	109	0	0	1	79	14	0	16	0	2	0	0	0	2	0	224	0	0	4	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Central Point Rd & Skellenger Way

Wednesday, April 05, 2017
7:00 AM to 9:00 AM

Peak Hour Summary
7:10 AM to 8:10 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:25 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	2
7:35 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:10 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
8:20 AM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:35 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
8:40 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:55 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Survey	0	4	0	4	1	7	1	9	1	0	0	1	0	0	0	0	14

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	1	1	1	3	0	0	0	0	0	0	0	0	3
7:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	1	0	1	0	2	0	2	1	0	0	1	0	0	0	0	4
8:30 AM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
8:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Survey	0	4	0	4	1	7	1	9	1	0	0	1	0	0	0	0	14

Heavy Vehicle Peak Hour Summary
7:10 AM to 8:10 AM

By Approach	Northbound Central Point Rd			Southbound Central Point Rd			Eastbound Skellenger Way			Westbound Skellenger Way			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	2	3	4	1	5	0	1	1	0	1	1	5
PHF	0.25			0.33			0.00			0.00			0.31

By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	1	0	1	1	2	1	4	0	0	0	0	0	0	0	0	5
PHF	0.00	0.25	0.00	0.25	0.25	0.50	0.25	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

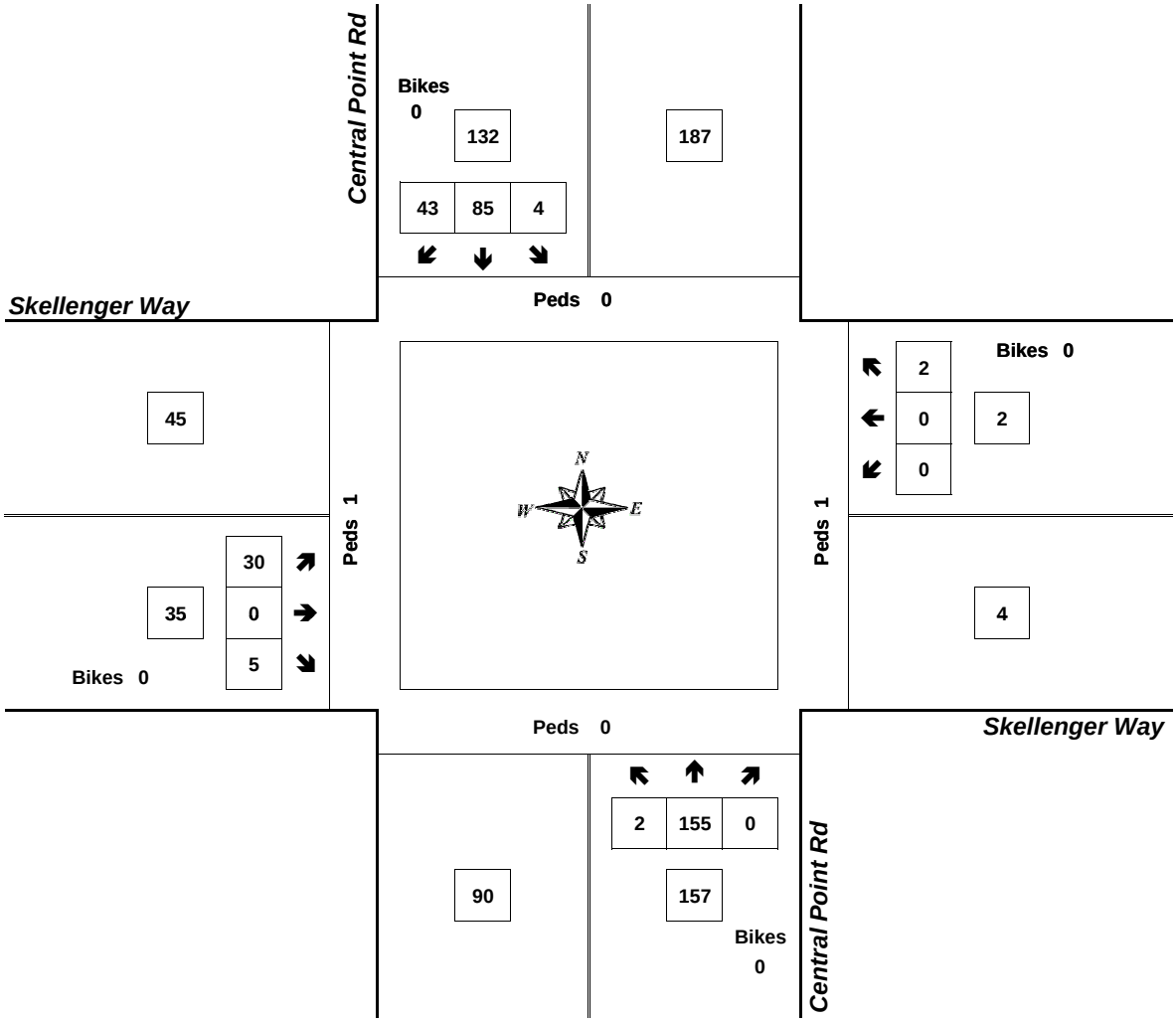
Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	1	0	1	1	2	1	4	0	0	0	0	0	0	0	0	5
7:15 AM	0	1	0	1	1	3	1	5	0	0	0	0	0	0	0	0	6
7:30 AM	0	1	0	1	1	5	1	7	1	0	0	1	0	0	0	0	9
7:45 AM	0	2	0	2	0	6	0	6	1	0	0	1	0	0	0	0	9
8:00 AM	0	3	0	3	0	5	0	5	1	0	0	1	0	0	0	0	9

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Central Point Rd & Skellenger Way

7:10 AM to 8:10 AM
Wednesday, April 05, 2017

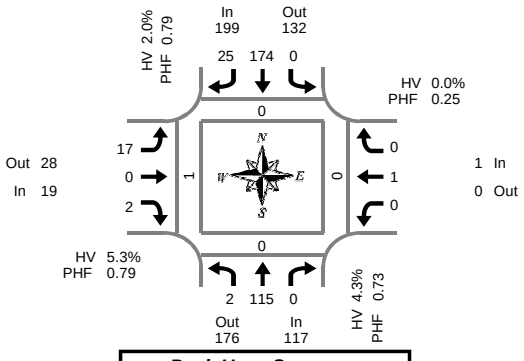


Approach	PHF	HV%	Volume
EB	0.67	0.0%	35
WB	0.25	0.0%	2
NB	0.84	0.6%	157
SB	0.70	3.0%	132
Intersection	0.78	1.5%	326

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Central Point Rd & Skellenger Way

Tuesday, April 04, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:55 PM to 5:55 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	5	0	0	0	6	3	0	0	0	1	0	0	0	0	0	15	0	0	0	0
4:05 PM	1	5	0	0	0	15	2	1	2	0	0	0	0	0	0	0	25	0	0	0	0
4:10 PM	0	7	0	1	0	12	1	0	2	0	0	0	0	0	0	0	22	0	0	0	0
4:15 PM	1	11	0	0	0	14	4	0	1	0	0	0	0	0	0	0	31	0	0	0	0
4:20 PM	0	5	0	0	0	8	2	0	0	0	0	0	0	0	0	0	15	0	0	0	0
4:25 PM	0	4	0	0	0	16	3	0	0	0	0	0	0	0	0	0	23	0	0	0	0
4:30 PM	0	8	0	0	0	8	4	0	0	0	0	0	0	0	0	0	20	0	0	0	0
4:35 PM	0	6	0	0	0	12	2	0	3	0	0	0	0	0	0	0	23	2	0	0	0
4:40 PM	0	11	0	0	0	12	1	0	2	0	0	0	0	0	0	0	26	0	0	0	0
4:45 PM	0	6	0	0	0	8	1	0	0	0	0	0	0	0	0	0	15	0	0	0	0
4:50 PM	0	6	0	0	0	8	1	0	4	1	0	0	0	0	0	0	20	0	0	0	0
4:55 PM	1	8	0	0	0	19	2	0	2	0	0	0	0	0	0	0	32	0	0	0	0
5:00 PM	0	10	0	0	0	10	2	0	2	0	0	0	0	0	0	0	24	0	0	0	0
5:05 PM	0	14	0	0	0	10	0	0	1	0	0	0	0	1	0	0	26	0	0	0	0
5:10 PM	0	10	0	0	0	21	3	1	0	0	1	0	0	0	0	0	35	0	0	0	0
5:15 PM	0	16	0	0	0	13	3	0	3	0	0	0	0	0	0	0	35	0	0	0	0
5:20 PM	0	8	0	0	0	21	2	0	2	0	0	0	0	0	0	0	33	0	0	0	0
5:25 PM	0	11	0	0	0	5	3	0	0	0	0	0	0	0	0	0	19	0	0	0	0
5:30 PM	1	8	0	0	0	10	2	0	2	0	0	0	0	0	0	0	23	0	0	0	0
5:35 PM	0	9	0	0	0	12	2	0	1	0	0	0	0	0	0	0	24	0	0	0	0
5:40 PM	0	8	0	0	0	15	2	0	1	0	0	0	0	0	0	0	26	0	0	0	0
5:45 PM	0	7	0	0	0	17	1	0	2	0	1	0	0	0	0	0	28	0	0	0	0
5:50 PM	0	6	0	0	0	21	3	0	1	0	0	0	0	0	0	0	31	0	0	0	1
5:55 PM	0	3	0	0	0	11	0	0	1	0	0	0	0	0	0	0	15	0	0	0	0
Total Survey	4	192	0	1	0	304	49	2	32	1	3	0	0	1	0	0	586	2	0	0	1

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	1	17	0	1	0	33	6	1	4	0	1	0	0	0	0	0	62	0	0	0	0
4:15 PM	1	20	0	0	0	38	9	0	1	0	0	0	0	0	0	0	69	0	0	0	0
4:30 PM	0	25	0	0	0	32	7	0	5	0	0	0	0	0	0	0	69	2	0	0	0
4:45 PM	1	20	0	0	0	35	4	0	6	1	0	0	0	0	0	0	67	0	0	0	0
5:00 PM	0	34	0	0	0	41	5	1	3	0	1	0	0	1	0	0	85	0	0	0	0
5:15 PM	0	35	0	0	0	39	8	0	5	0	0	0	0	0	0	0	87	0	0	0	0
5:30 PM	1	25	0	0	0	37	6	0	4	0	0	0	0	0	0	0	73	0	0	0	0
5:45 PM	0	16	0	0	0	49	4	0	4	0	1	0	0	0	0	0	74	0	0	0	1
Total Survey	4	192	0	1	0	304	49	2	32	1	3	0	0	1	0	0	586	2	0	0	1

Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	117	176	293	0	199	132	331	1	19	28	47	0	1	0	1	0	336	0	0	0	1
%HV	4.3%				2.0%				5.3%				0.0%				3.0%				
PHF	0.73				0.79				0.79				0.25				0.82				

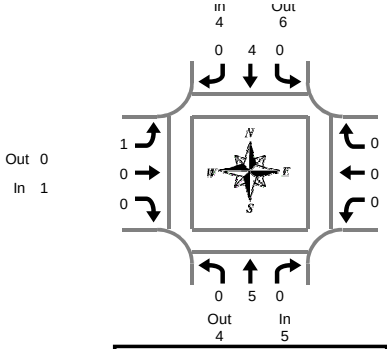
By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	115	0	117	0	174	25	199	17	0	2	19	0	1	0	1	336
%HV	0.0%	4.3%	0.0%	4.3%	0.0%	2.3%	0.0%	2.0%	5.9%	0.0%	0.0%	5.3%	0.0%	0.0%	0.0%	0.0%	3.0%
PHF	0.50	0.72	0.00	0.73	0.00	0.79	0.78	0.79	0.85	0.00	0.50	0.79	0.00	0.25	0.00	0.25	0.82

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	3	82	0	1	0	138	26	1	16	1	1	0	0	0	0	0	267	2	0	0	0
4:15 PM	2	99	0	0	0	146	25	1	15	1	1	0	0	1	0	0	290	2	0	0	0
4:30 PM	1	114	0	0	0	147	24	1	19	1	1	0	0	1	0	0	308	2	0	0	0
4:45 PM	2	114	0	0	0	152	23	1	18	1	1	0	0	1	0	0	312	0	0	0	0
5:00 PM	1	110	0	0	0	166	23	1	16	0	2	0	0	1	0	0	319	0	0	0	1

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Central Point Rd & Skellenger Way

Tuesday, April 04, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:55 PM to 5:55 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	0	0	0	0	2	0	2	1	0	0	1	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:05 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:10 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:20 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
5:25 PM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:50 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	6	0	6	0	7	1	8	2	0	0	2	0	0	0	0	16

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	2	1	3	1	0	0	1	0	0	0	0	4
4:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
5:00 PM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
5:15 PM	0	2	0	2	0	0	0	0	1	0	0	1	0	0	0	0	3
5:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
Total Survey	0	6	0	6	0	7	1	8	2	0	0	2	0	0	0	0	16

Heavy Vehicle Peak Hour Summary
4:55 PM to 5:55 PM

By Approach	Northbound Central Point Rd			Southbound Central Point Rd			Eastbound Skellenger Way			Westbound Skellenger Way			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	5	4	9	4	6	10	1	0	1	0	0	0	10
PHF	0.42			0.50			0.25			0.00			0.83

By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	5	0	5	0	4	0	4	1	0	0	1	0	0	0	0	10
PHF	0.00	0.42	0.00	0.42	0.00	0.50	0.00	0.50	0.25	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.83

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

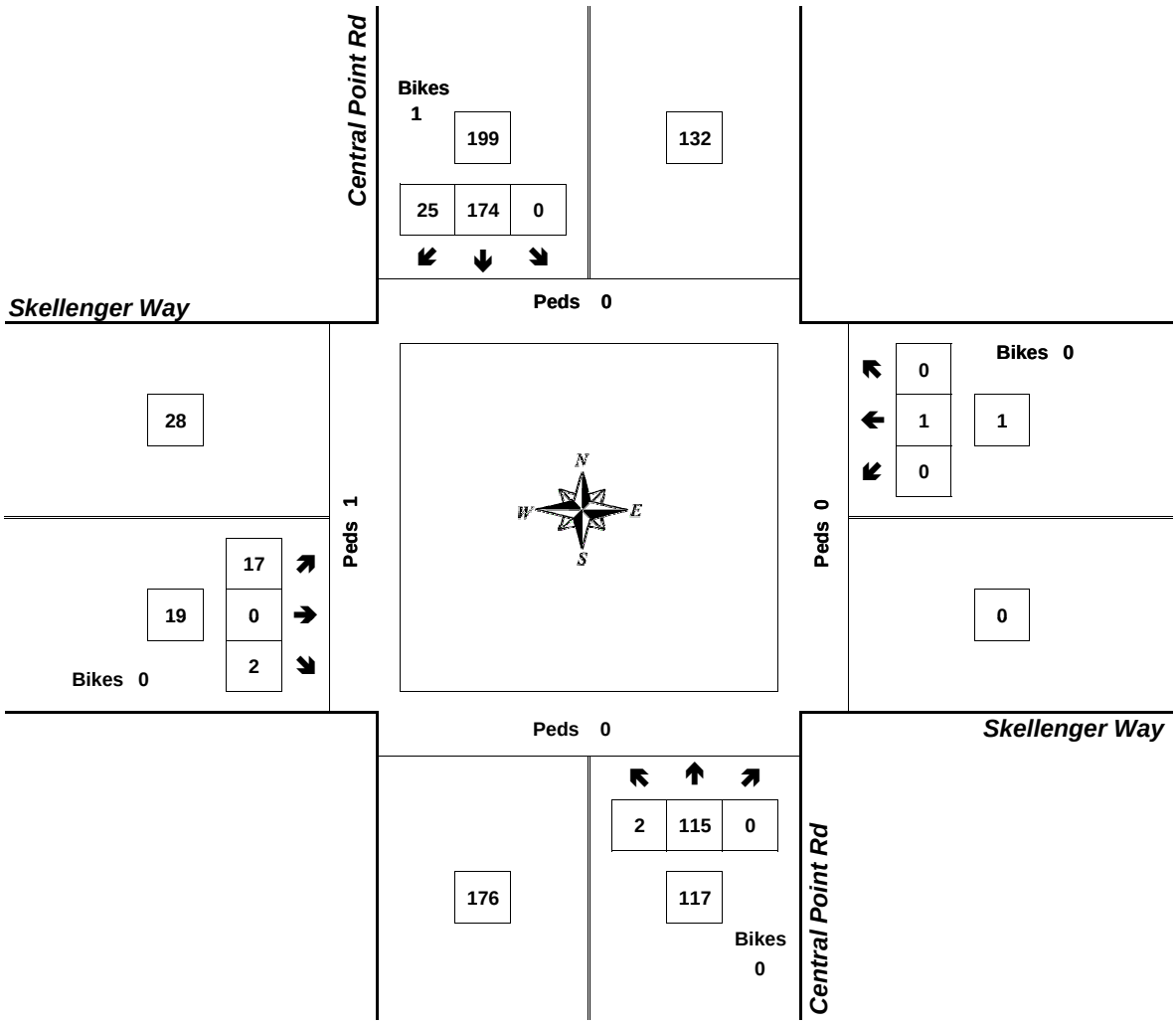
Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Skellenger Way				Westbound Skellenger Way				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	2	0	2	0	3	1	4	1	0	0	1	0	0	0	0	7
4:15 PM	0	3	0	3	0	3	0	3	0	0	0	0	0	0	0	0	6
4:30 PM	0	4	0	4	0	3	0	3	1	0	0	1	0	0	0	0	8
4:45 PM	0	5	0	5	0	3	0	3	1	0	0	1	0	0	0	0	9
5:00 PM	0	4	0	4	0	4	0	4	1	0	0	1	0	0	0	0	9

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Central Point Rd & Skellenger Way

4:55 PM to 5:55 PM
Tuesday, April 04, 2017

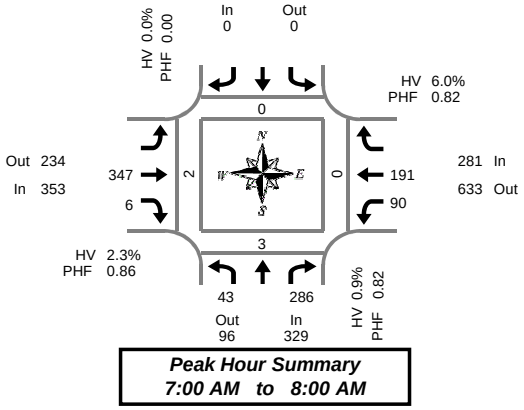


Approach	PHF	HV%	Volume
EB	0.79	5.3%	19
WB	0.25	0.0%	1
NB	0.73	4.3%	117
SB	0.79	2.0%	199
Intersection	0.82	3.0%	336

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Central Point Rd & Warner Parrott Rd

Wednesday, April 05, 2017
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes			North	South	East	West
7:00 AM	2		30	0				0	22	1	0	8	14		0	77		0	0	0	0
7:05 AM	2		22	0				0	29	1	0	4	10		0	68		0	0	0	0
7:10 AM	4		24	0				0	30	1	0	10	8		0	77		0	0	0	0
7:15 AM	4		23	0				0	26	0	0	6	13		0	72		0	0	0	0
7:20 AM	3		19	0				0	43	0	0	6	15		0	86		0	1	0	0
7:25 AM	4		21	0				0	33	1	0	9	18		0	86		0	0	0	0
7:30 AM	4		24	0				0	22	0	0	11	18		0	79		0	0	0	0
7:35 AM	5		29	0				0	22	0	0	7	23		0	86		0	1	0	0
7:40 AM	4		27	0				0	25	0	0	8	13		0	77		0	0	0	0
7:45 AM	8		27	0				0	24	0	0	7	21		0	87		0	0	0	0
7:50 AM	2		21	0				0	36	1	0	9	20		0	89		0	1	0	2
7:55 AM	1		19	0				0	35	1	0	5	18		0	79		0	0	0	0
8:00 AM	1		23	0				0	22	0	0	9	15		1	70		0	0	0	0
8:05 AM	5		16	0				0	25	0	0	5	12		0	63		0	1	0	0
8:10 AM	3		22	0				0	18	1	0	6	14		0	64		0	1	0	0
8:15 AM	1		21	0				0	32	0	0	7	25		0	86		0	4	0	0
8:20 AM	4		21	0				0	16	0	0	12	22		0	75		0	0	0	0
8:25 AM	5		24	0				0	27	0	0	6	18		0	80		0	1	0	0
8:30 AM	4		18	0				0	33	1	0	12	16		0	84		0	2	0	0
8:35 AM	3		19	0				0	24	0	0	5	22		0	73		0	1	0	0
8:40 AM	1		15	0				0	20	0	0	16	20		0	72		0	0	0	0
8:45 AM	3		19	0				0	25	2	0	12	21		0	82		0	1	0	0
8:50 AM	2		20	0				0	28	1	0	12	23		0	86		0	0	0	0
8:55 AM	1		19	0				0	33	1	0	10	26		0	90		0	0	0	0
Total Survey	76		523	0				0	650	12	0	202	425		1	1,888		0	14	0	2

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes			North	South	East	West
7:00 AM	8		76	0				0	81	3	0	22	32		0	222		0	0	0	0
7:15 AM	11		63	0				0	102	1	0	21	46		0	244		0	1	0	0
7:30 AM	13		80	0				0	69	0	0	26	54		0	242		0	1	0	0
7:45 AM	11		67	0				0	95	2	0	21	59		0	255		0	1	0	2
8:00 AM	9		61	0				0	65	1	0	20	41		1	197		0	2	0	0
8:15 AM	10		66	0				0	75	0	0	25	65		0	241		0	5	0	0
8:30 AM	8		52	0				0	77	1	0	33	58		0	229		0	3	0	0
8:45 AM	6		58	0				0	86	4	0	34	70		0	258		0	1	0	0
Total Survey	76		523	0				0	650	12	0	202	425		1	1,888		0	14	0	2

Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	329	96	425	0	0	0	0	0	353	234	587	0	281	633	914	0	963	0	3	0	2
%HV	0.9%				0.0%				2.3%				6.0%				2.9%				
PHF	0.82				0.00				0.86				0.82				0.94				

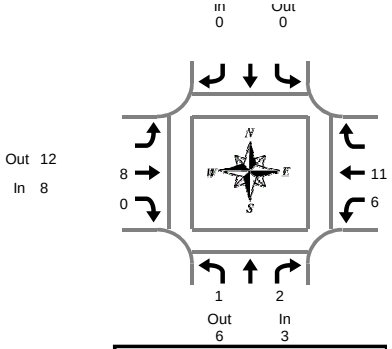
By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	43		286	329				0		347	6	353	90	191		281	963
%HV	2.3%	NA	0.7%	0.9%	NA	NA	NA	0.0%	NA	2.3%	0.0%	2.3%	6.7%	5.8%	NA	6.0%	2.9%
PHF	0.63		0.86	0.82				0.00		0.85	0.50	0.86	0.83	0.81		0.82	0.94

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes			North	South	East	West
7:00 AM	43		286	0				0	347	6	0	90	191		0	963		0	3	0	2
7:15 AM	44		271	0				0	331	4	0	88	200		1	938		0	5	0	2
7:30 AM	43		274	0				0	304	3	0	92	219		1	935		0	9	0	2
7:45 AM	38		246	0				0	312	4	0	99	223		1	922		0	11	0	2
8:00 AM	33		237	0				0	303	6	0	112	234		1	925		0	11	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Central Point Rd & Warner Parrott Rd

Wednesday, April 05, 2017
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total
	L		R	Total				Total	T	R	Total		L	T		Total	
7:00 AM	0		1	1				0	0	0	0		0	0		0	1
7:05 AM	0		0	0				0	1	0	1		0	1		1	2
7:10 AM	0		0	0				0	1	0	1		0	0		0	1
7:15 AM	0		0	0				0	0	0	0		2	2		4	4
7:20 AM	0		1	1				0	0	0	0		0	0		0	1
7:25 AM	0		0	0				0	2	0	2		2	1		3	5
7:30 AM	0		0	0				0	1	0	1		1	1		2	3
7:35 AM	0		0	0				0	0	0	0		0	1		1	1
7:40 AM	1		0	1				0	1	0	1		0	1		1	3
7:45 AM	0		0	0				0	0	0	0		1	2		3	3
7:50 AM	0		0	0				0	1	0	1		0	1		1	2
7:55 AM	0		0	0				0	1	0	1		0	1		1	2
8:00 AM	0		0	0				0	0	0	0		2	2		4	4
8:05 AM	0		0	0				0	0	0	0		0	2		2	2
8:10 AM	0		1	1				0	2	0	2		0	0		0	3
8:15 AM	0		0	0				0	1	0	1		0	0		0	1
8:20 AM	0		2	2				0	1	0	1		2	1		3	6
8:25 AM	0		0	0				0	0	0	0		0	0		0	0
8:30 AM	0		2	2				0	1	0	1		2	0		2	5
8:35 AM	0		1	1				0	1	0	1		0	1		1	3
8:40 AM	0		0	0				0	1	0	1		0	0		0	1
8:45 AM	0		2	2				0	1	0	1		0	1		1	4
8:50 AM	0		0	0				0	2	0	2		0	1		1	3
8:55 AM	0		1	1				0	0	0	0		0	2		2	3
Total Survey	1		11	12				0	18	0	18		12	21		33	63

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total
	L		R	Total				Total	T	R	Total		L	T		Total	
7:00 AM	0		1	1				0	2	0	2		0	1		1	4
7:15 AM	0		1	1				0	2	0	2		4	3		7	10
7:30 AM	1		0	1				0	2	0	2		1	3		4	7
7:45 AM	0		0	0				0	2	0	2		1	4		5	7
8:00 AM	0		1	1				0	2	0	2		2	4		6	9
8:15 AM	0		2	2				0	2	0	2		2	1		3	7
8:30 AM	0		3	3				0	3	0	3		2	1		3	9
8:45 AM	0		3	3				0	3	0	3		0	4		4	10
Total Survey	1		11	12				0	18	0	18		12	21		33	63

Heavy Vehicle Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound Central Point Rd			Southbound Central Point Rd			Eastbound Warner Parrott Rd			Westbound Warner Parrott Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	6	9	0	0	0	8	12	20	17	10	27	28
PHF	0.75			0.00			0.67			0.61			0.70

By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Total
	L		R	Total				Total	T	R	Total		L	T		Total	
Volume	1		2	3				0	8	0	8		6	11		17	28
PHF	0.25		0.50	0.75				0.00	0.67	0.00	0.67		0.38	0.69		0.61	0.70

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

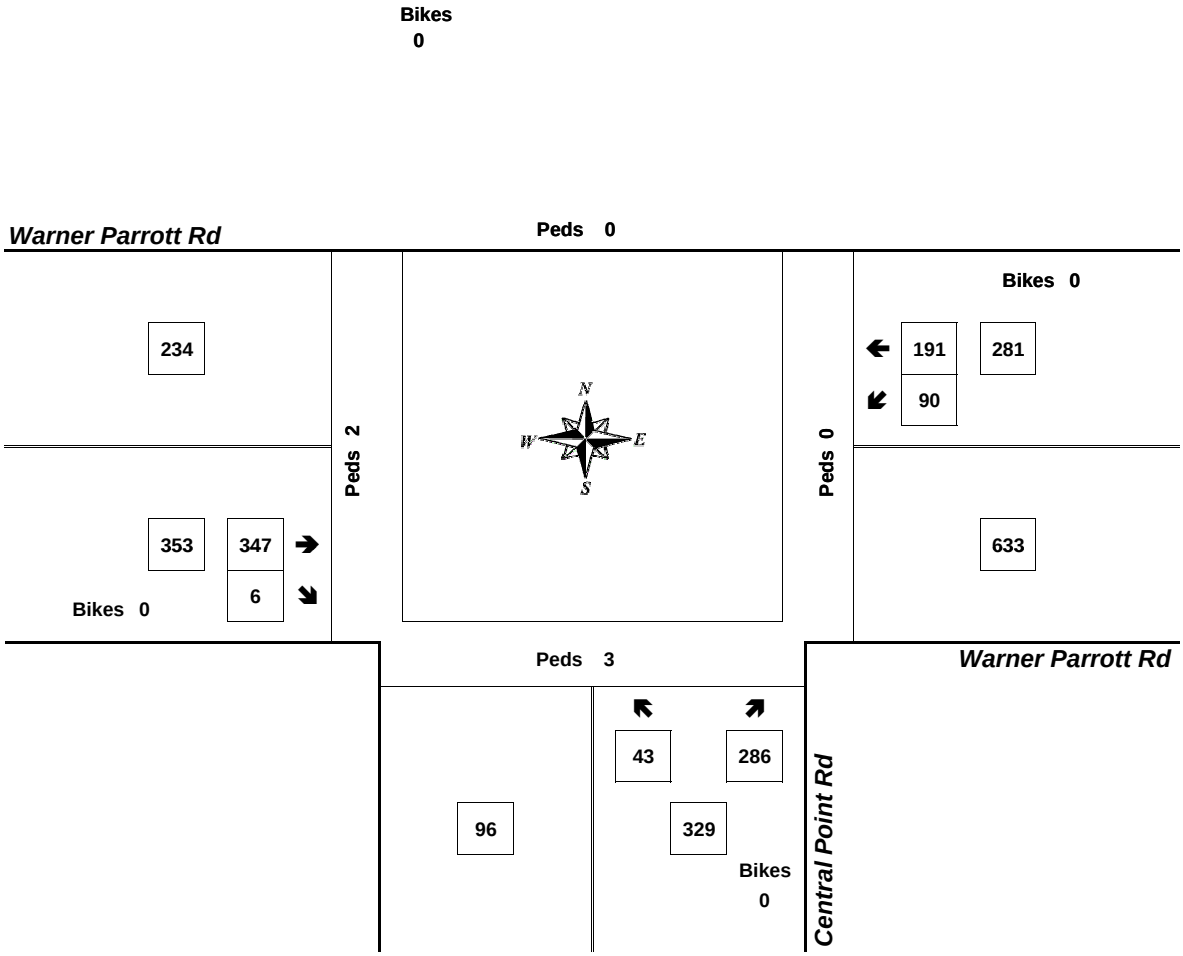
Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total
	L		R	Total				Total	T	R	Total		L	T		Total	
7:00 AM	1		2	3				0	8	0	8		6	11		17	28
7:15 AM	1		2	3				0	8	0	8		8	14		22	33
7:30 AM	1		3	4				0	8	0	8		6	12		18	30
7:45 AM	0		6	6				0	9	0	9		7	10		17	32
8:00 AM	0		9	9				0	10	0	10		6	10		16	35

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Central Point Rd & Warner Parrott Rd

7:00 AM to 8:00 AM
Wednesday, April 05, 2017

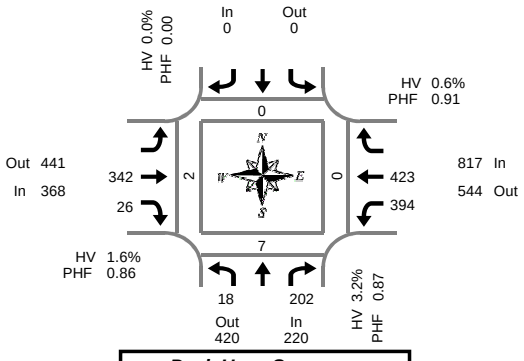


Approach	PHF	HV%	Volume
EB	0.86	2.3%	353
WB	0.82	6.0%	281
NB	0.82	0.9%	329
SB	0.00	0.0%	0
Intersection	0.94	2.9%	963

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:50 PM to 5:50 PM

Central Point Rd & Warner Parrott Rd

Tuesday, April 04, 2017
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes			North	South	East	West
4:00 PM	0		6	0				0	49	2	0	17	36		0	110		0	0	0	0
4:05 PM	0		9	0				0	37	0	0	31	29		0	106		0	1	0	0
4:10 PM	1		22	0				0	23	3	0	29	41		0	119		0	0	0	0
4:15 PM	1		16	1				0	35	4	0	34	38		0	128		0	0	0	0
4:20 PM	1		15	0				0	33	2	0	29	25		0	105		0	0	0	0
4:25 PM	2		11	0				0	28	3	0	21	22		0	87		0	0	0	0
4:30 PM	1		19	0				0	15	0	0	25	28		0	88		0	0	0	0
4:35 PM	1		15	0				0	26	2	0	25	36		0	105		0	1	0	0
4:40 PM	2		21	0				0	23	3	0	25	25		0	99		0	0	0	0
4:45 PM	1		19	0				0	32	4	0	23	43		0	122		0	0	0	0
4:50 PM	3		17	0				0	27	1	0	35	30		0	113		0	1	0	0
4:55 PM	2		24	0				0	24	5	0	40	26		0	121		0	1	0	0
5:00 PM	0		16	0				0	21	2	0	31	37		0	107		0	0	0	0
5:05 PM	1		10	0				0	33	0	0	38	50		1	132		0	2	0	0
5:10 PM	2		14	0				0	15	2	0	36	32		0	101		0	0	0	1
5:15 PM	2		13	0				0	36	4	0	28	39		0	122		0	0	0	1
5:20 PM	2		18	0				0	30	3	0	42	34		0	129		0	0	0	0
5:25 PM	0		19	0				0	33	1	0	26	28		0	107		0	0	0	0
5:30 PM	3		21	0				0	28	4	0	13	33		0	102		0	0	0	0
5:35 PM	1		12	0				0	36	1	0	27	48		0	125		0	0	0	0
5:40 PM	1		20	0				0	26	2	0	33	40		0	122		0	1	0	0
5:45 PM	1		18	0				0	33	1	0	45	26		0	124		0	2	0	0
5:50 PM	1		18	0				0	25	1	0	35	28		0	108		0	0	0	2
5:55 PM	1		13	0				0	30	6	0	21	40		0	111		0	0	0	0
Total Survey	30		386	1				0	698	56	0	709	814		1	2,693		0	9	0	4

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes			North	South	East	West
4:00 PM	1		37	0				0	109	5	0	77	106		0	335		0	1	0	0
4:15 PM	4		42	1				0	96	9	0	84	85		0	320		0	0	0	0
4:30 PM	4		55	0				0	64	5	0	75	89		0	292		0	1	0	0
4:45 PM	6		60	0				0	83	10	0	98	99		0	356		0	2	0	0
5:00 PM	3		40	0				0	69	4	0	105	119		1	340		0	2	0	1
5:15 PM	4		50	0				0	99	8	0	96	101		0	358		0	0	0	1
5:30 PM	5		53	0				0	90	7	0	73	121		0	349		0	1	0	0
5:45 PM	3		49	0				0	88	8	0	101	94		0	343		0	2	0	2
Total Survey	30		386	1				0	698	56	0	709	814		1	2,693		0	9	0	4

Peak Hour Summary
4:50 PM to 5:50 PM

By Approach	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	220	420	640	0	0	0	0	0	368	441	809	0	817	544	1,361	1	1,405	0	7	0	2
%HV	3.2%				0.0%				1.6%				0.6%				1.3%				
PHF	0.87				0.00				0.86				0.91				0.95				

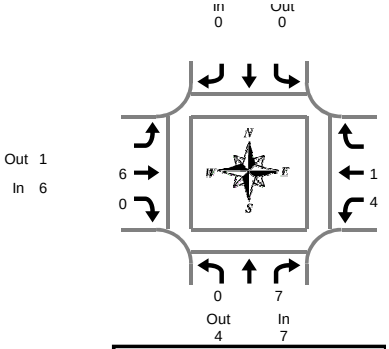
By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	18		202	220				0		342	26	368	394	423		817	1,405
%HV	0.0%	NA	3.5%	3.2%	NA	NA	NA	0.0%	NA	1.8%	0.0%	1.6%	1.0%	0.2%	NA	0.6%	1.3%
PHF	0.75		0.87	0.87				0.00		0.86	0.72	0.86	0.90	0.87		0.91	0.95

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes			North	South	East	West
4:00 PM	15		194	1				0	352	29	0	334	379		0	1,303		0	4	0	0
4:15 PM	17		197	1				0	312	28	0	362	392		1	1,308		0	5	0	1
4:30 PM	17		205	0				0	315	27	0	374	408		1	1,346		0	5	0	2
4:45 PM	18		203	0				0	341	29	0	372	440		1	1,403		0	5	0	2
5:00 PM	15		192	0				0	346	27	0	375	435		1	1,390		0	5	0	4

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Central Point Rd & Warner Parrott Rd

Tuesday, April 04, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:50 PM to 5:50 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
4:00 PM	0		1	1				0	2	0	2	0	0		0	3
4:05 PM	0		1	1				0	1	0	1	0	0		0	2
4:10 PM	0		0	0				0	2	0	2	0	1		1	3
4:15 PM	0		0	0				0	0	0	0	1	1		2	2
4:20 PM	0		0	0				0	0	0	0	1	1		2	2
4:25 PM	0		1	1				0	0	0	0	0	0		0	1
4:30 PM	0		3	3				0	0	0	0	0	0		0	3
4:35 PM	0		0	0				0	0	0	0	0	2		2	2
4:40 PM	0		0	0				0	1	0	1	1	0		1	2
4:45 PM	0		0	0				0	1	0	1	1	0		1	2
4:50 PM	0		0	0				0	0	0	0	0	0		0	0
4:55 PM	0		2	2				0	2	0	2	0	0		0	4
5:00 PM	0		1	1				0	0	0	0	0	0		0	1
5:05 PM	0		1	1				0	0	0	0	1	0		1	2
5:10 PM	0		0	0				0	0	0	0	1	0		1	1
5:15 PM	0		0	0				0	0	0	0	0	0		0	0
5:20 PM	0		0	0				0	1	0	1	1	1		2	3
5:25 PM	0		0	0				0	1	0	1	1	0		1	2
5:30 PM	0		2	2				0	1	0	1	0	0		0	3
5:35 PM	0		0	0				0	0	0	0	0	0		0	0
5:40 PM	0		1	1				0	0	0	0	0	0		0	1
5:45 PM	0		0	0				0	1	0	1	0	0		0	1
5:50 PM	0		0	0				0	1	0	1	0	0		0	1
5:55 PM	0		0	0				0	0	0	0	0	0		0	0
Total Survey	0		13	13				0	14	0	14	8	6		14	41

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
4:00 PM	0		2	2				0	5	0	5	0	1		1	8
4:15 PM	0		1	1				0	0	0	0	2	2		4	5
4:30 PM	0		3	3				0	1	0	1	1	2		3	7
4:45 PM	0		2	2				0	3	0	3	1	0		1	6
5:00 PM	0		2	2				0	0	0	0	2	0		2	4
5:15 PM	0		0	0				0	2	0	2	2	1		3	5
5:30 PM	0		3	3				0	1	0	1	0	0		0	4
5:45 PM	0		0	0				0	2	0	2	0	0		0	2
Total Survey	0		13	13				0	14	0	14	8	6		14	41

Heavy Vehicle Peak Hour Summary
4:50 PM to 5:50 PM

By Approach	Northbound Central Point Rd			Southbound Central Point Rd			Eastbound Warner Parrott Rd			Westbound Warner Parrott Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	7	4	11	0	0	0	6	1	7	5	13	18	18
PHF	0.44			0.00			0.50			0.42			0.56

By Movement	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Total
	L		R	Total				Total	T	R	Total	L	T		Total	
Volume	0		7	7				0	6	0	6	4	1		5	18
PHF	0.00		0.44	0.44				0.00	0.50	0.00	0.50	0.50	0.25		0.42	0.56

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

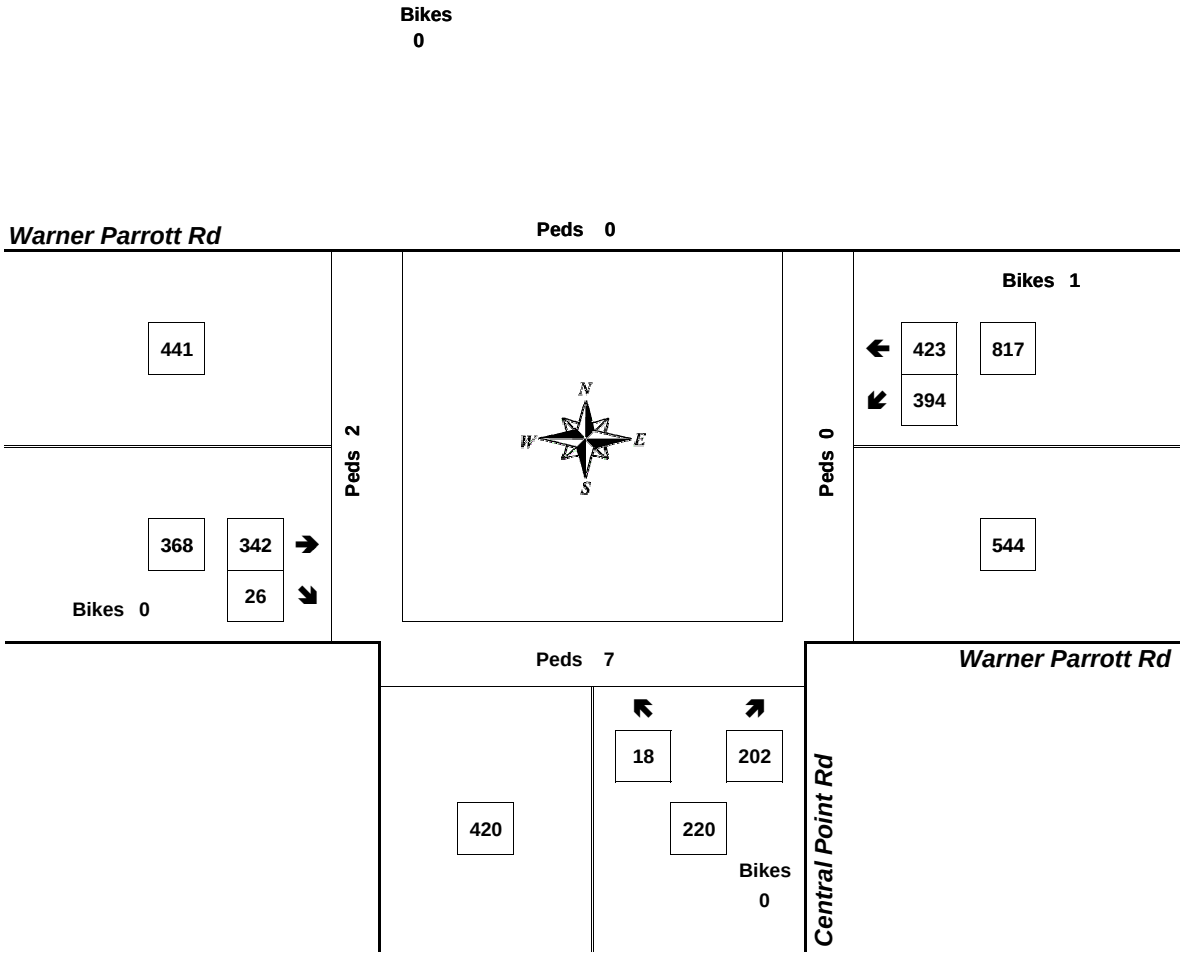
Interval Start Time	Northbound Central Point Rd				Southbound Central Point Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
4:00 PM	0		8	8				0	9	0	9	4	5		9	26
4:15 PM	0		8	8				0	4	0	4	6	4		10	22
4:30 PM	0		7	7				0	6	0	6	6	3		9	22
4:45 PM	0		7	7				0	6	0	6	5	1		6	19
5:00 PM	0		5	5				0	5	0	5	4	1		5	15

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Central Point Rd & Warner Parrott Rd

4:50 PM to 5:50 PM
Tuesday, April 04, 2017

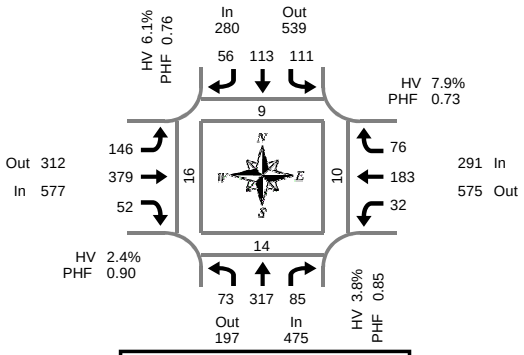


Approach	PHF	HV%	Volume
EB	0.86	1.6%	368
WB	0.91	0.6%	817
NB	0.87	3.2%	220
SB	0.00	0.0%	0
Intersection	0.95	1.3%	1,405

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:40 AM to 8:40 AM

Leland Rd & Warner Parrott Rd

Wednesday, April 05, 2017
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	3	25	12	0	6	3	3	0	5	46	3	1	4	15	5	0	130	0	0	0	0
7:05 AM	1	24	10	0	7	3	1	0	8	37	7	0	1	12	7	0	118	0	0	0	0
7:10 AM	6	20	3	0	10	4	2	0	7	42	5	0	0	10	6	0	115	0	0	0	0
7:15 AM	6	32	11	0	10	6	2	0	7	40	3	0	1	11	3	0	132	0	0	0	0
7:20 AM	4	38	6	0	10	5	2	0	9	40	7	0	3	15	5	0	144	0	0	0	0
7:25 AM	8	21	8	0	8	1	0	0	7	45	5	0	4	19	4	0	130	0	1	0	0
7:30 AM	9	23	2	0	9	5	3	0	6	38	3	0	3	19	4	0	124	1	0	0	0
7:35 AM	12	27	10	0	2	8	2	0	10	39	3	0	0	14	3	0	130	1	0	0	1
7:40 AM	2	34	10	0	12	10	5	0	11	33	6	0	2	14	4	0	143	0	0	0	0
7:45 AM	9	35	6	0	5	11	2	0	13	30	5	0	1	17	6	0	140	0	0	0	0
7:50 AM	8	23	13	0	7	10	2	0	10	48	4	0	3	19	4	0	151	0	2	0	0
7:55 AM	10	21	11	0	10	6	4	0	5	37	9	0	4	11	7	0	135	0	0	0	0
8:00 AM	6	24	9	0	13	10	4	0	9	35	3	0	5	12	5	0	135	1	1	0	2
8:05 AM	3	23	6	0	6	8	0	1	10	31	5	0	0	13	7	0	112	2	0	0	3
8:10 AM	7	14	7	0	8	10	5	0	12	22	4	0	2	8	6	0	105	0	3	2	0
8:15 AM	11	27	3	0	11	6	4	0	12	34	2	0	2	18	4	0	134	3	3	4	5
8:20 AM	3	33	6	0	6	7	6	0	14	26	0	0	2	24	7	0	134	1	0	0	3
8:25 AM	3	29	7	0	7	7	8	0	13	30	4	0	3	17	8	0	136	0	1	1	0
8:30 AM	6	29	5	0	8	13	7	0	20	33	4	0	6	18	14	0	163	2	3	3	3
8:35 AM	5	25	2	1	18	15	9	0	17	20	6	0	2	12	4	0	135	0	1	0	0
8:40 AM	6	25	5	0	14	15	10	0	5	25	3	0	4	22	8	0	142	1	0	2	0
8:45 AM	5	13	9	0	13	11	4	0	3	40	4	0	2	22	5	0	131	0	3	0	0
8:50 AM	7	15	4	0	10	5	6	0	4	36	3	0	3	22	6	0	121	1	0	0	1
8:55 AM	7	14	7	0	5	12	6	0	9	34	10	0	3	23	5	0	135	0	0	0	0
Total Survey	147	594	172	1	215	191	97	1	226	841	108	1	60	387	137	0	3,175	13	18	12	18

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	10	69	25	0	23	10	6	0	20	125	15	1	5	37	18	0	363	0	0	0	0
7:15 AM	18	91	25	0	28	12	4	0	23	125	15	0	8	45	12	0	406	0	1	0	0
7:30 AM	23	84	22	0	23	23	10	0	27	110	12	0	5	47	11	0	397	2	0	0	1
7:45 AM	27	79	30	0	22	27	8	0	28	115	18	0	8	47	17	0	426	0	2	0	0
8:00 AM	16	61	22	0	27	28	9	1	31	88	12	0	7	33	18	0	352	3	4	2	5
8:15 AM	17	89	16	0	24	20	18	0	39	90	6	0	7	59	19	0	404	4	4	5	8
8:30 AM	17	79	12	1	40	43	26	0	42	78	13	0	12	52	26	0	440	3	4	5	3
8:45 AM	19	42	20	0	28	28	16	0	16	110	17	0	8	67	16	0	387	1	3	0	1
Total Survey	147	594	172	1	215	191	97	1	226	841	108	1	60	387	137	0	3,175	13	18	12	18

Peak Hour Summary
7:40 AM to 8:40 AM

By Approach	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	475	197	672	1	280	539	819	1	577	312	889	0	291	575	866	0	1,623	9	14	10	16
%HV	3.8%				6.1%				2.4%				7.9%				4.4%				
PHF	0.85				0.76				0.90				0.73				0.93				

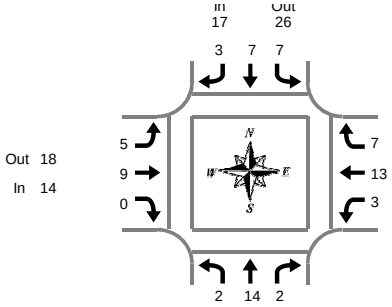
By Movement	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	73	317	85	475	111	113	56	280	146	379	52	577	32	183	76	291	1,623
%HV	2.7%	4.4%	2.4%	3.8%	6.3%	6.2%	5.4%	6.1%	3.4%	2.4%	0.0%	2.4%	9.4%	7.1%	9.2%	7.9%	4.4%
PHF	0.68	0.86	0.64	0.85	0.84	0.81	0.58	0.76	0.73	0.79	0.72	0.90	0.67	0.78	0.66	0.73	0.93

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	78	323	102	0	96	72	28	0	98	475	60	1	26	176	58	0	1,592	2	3	0	1
7:15 AM	84	315	99	0	100	90	31	1	109	438	57	0	28	172	58	0	1,581	5	7	2	6
7:30 AM	83	313	90	0	96	98	45	1	125	403	48	0	27	186	65	0	1,579	9	10	7	14
7:45 AM	77	308	80	1	113	118	61	1	140	371	49	0	34	191	80	0	1,622	10	14	12	16
8:00 AM	69	271	70	1	119	119	69	1	128	366	48	0	34	211	79	0	1,583	11	15	12	17

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Leland Rd & Warner Parrott Rd

Wednesday, April 05, 2017
7:00 AM to 9:00 AM

Peak Hour Summary
7:40 AM to 8:40 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	2	3
7:10 AM	0	0	0	0	2	0	0	2	0	1	0	1	0	0	1	1	4
7:15 AM	1	0	1	2	1	0	1	2	0	1	0	1	0	1	0	1	6
7:20 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	0	1	1	3
7:25 AM	2	0	0	2	1	0	0	1	1	1	0	2	1	1	0	2	7
7:30 AM	0	1	0	1	0	2	0	2	0	1	0	1	0	2	1	3	7
7:35 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
7:40 AM	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	2
7:45 AM	0	1	1	2	0	1	0	1	0	0	0	0	0	3	1	4	7
7:50 AM	1	1	0	2	1	0	0	1	0	2	0	2	0	0	1	1	6
7:55 AM	1	0	0	1	1	0	1	2	0	1	0	1	0	0	0	0	4
8:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	1	3	1	5	6
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
8:10 AM	0	0	0	0	1	0	0	1	1	1	0	2	0	0	1	1	4
8:15 AM	0	1	0	1	1	0	0	1	1	1	0	2	0	0	1	1	5
8:20 AM	0	1	0	1	0	0	0	0	1	1	0	2	0	3	0	3	6
8:25 AM	0	5	1	6	0	0	0	0	1	0	0	1	2	0	0	2	9
8:30 AM	0	3	0	3	0	1	1	2	0	2	0	2	0	1	1	2	9
8:35 AM	0	1	0	1	2	5	0	7	1	1	0	2	0	1	1	2	12
8:40 AM	0	0	0	0	1	0	1	2	0	0	1	1	0	0	0	0	3
8:45 AM	0	0	0	0	0	3	0	3	0	2	1	3	0	2	1	3	9
8:50 AM	1	1	0	2	0	0	0	0	0	0	2	2	0	0	0	0	4
8:55 AM	1	0	0	1	0	0	0	0	1	0	0	1	0	1	0	1	3
Total Survey	7	16	3	26	14	12	5	31	7	17	4	28	4	22	12	38	123

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	2	0	0	2	0	2	0	2	0	1	2	3	7
7:15 AM	3	0	1	4	3	0	1	4	1	3	0	4	1	2	1	4	16
7:30 AM	0	1	0	1	2	2	1	5	0	1	0	1	0	3	1	4	11
7:45 AM	2	2	1	5	2	1	1	4	0	3	0	3	0	3	2	5	17
8:00 AM	0	1	0	1	1	0	0	1	1	1	0	2	1	5	2	8	12
8:15 AM	0	7	1	8	1	0	0	1	3	2	0	5	2	3	1	6	20
8:30 AM	0	4	0	4	3	6	2	11	1	3	1	5	0	2	2	4	24
8:45 AM	2	1	0	3	0	3	0	3	1	2	3	6	0	3	1	4	16
Total Survey	7	16	3	26	14	12	5	31	7	17	4	28	4	22	12	38	123

Heavy Vehicle Peak Hour Summary
7:40 AM to 8:40 AM

By Approach	Northbound Leland Rd			Southbound Leland Rd			Eastbound Warner Parrott Rd			Westbound Warner Parrott Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	18	10	28	17	26	43	14	18	32	23	18	41	72
PHF	0.45			0.47			0.58			0.72			0.60

By Movement	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	14	2	18	7	7	3	17	5	9	0	14	3	13	7	23	72
PHF	0.25	0.39	0.50	0.45	0.88	0.29	0.75	0.47	0.42	0.75	0.00	0.58	0.38	0.65	0.88	0.72	0.60

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	5	3	2	10	9	3	3	15	1	9	0	10	1	9	6	16	51
7:15 AM	5	4	2	11	8	3	3	14	2	8	0	10	2	13	6	21	56
7:30 AM	2	11	2	15	6	3	2	11	4	7	0	11	3	14	6	23	60
7:45 AM	2	14	2	18	7	7	3	17	5	9	1	15	3	13	7	23	73
8:00 AM	2	13	1	16	5	9	2	16	6	8	4	18	3	13	6	22	72

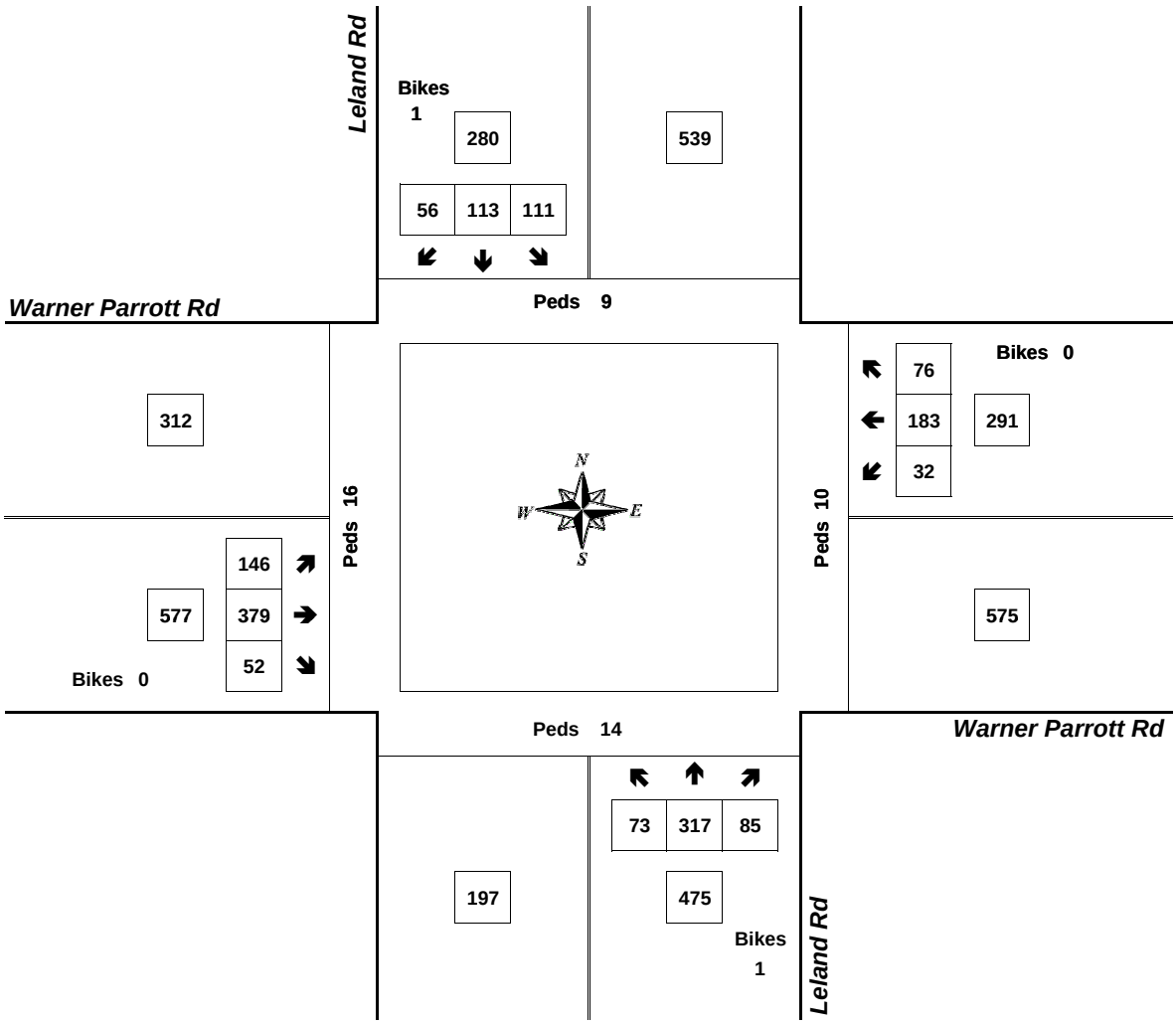
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Leland Rd & Warner Parrott Rd

7:40 AM to 8:40 AM
Wednesday, April 05, 2017

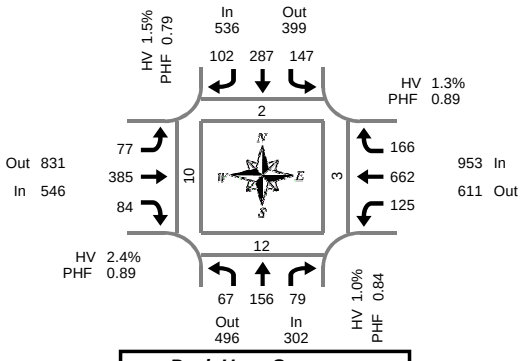


Approach	PHF	HV%	Volume
EB	0.90	2.4%	577
WB	0.73	7.9%	291
NB	0.85	3.8%	475
SB	0.76	6.1%	280
Intersection	0.93	4.4%	1,623

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:45 PM to 5:45 PM

Leland Rd & Warner Parrott Rd

Tuesday, April 04, 2017
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	7	9	8	0	17	17	8	0	4	38	10	0	4	39	9	0	170	0	0	1	3
4:05 PM	5	8	8	0	6	20	12	0	3	37	9	1	19	45	16	0	188	1	0	0	1
4:10 PM	8	13	5	0	16	24	16	0	6	29	8	0	12	39	10	0	186	0	2	0	0
4:15 PM	5	6	5	0	13	21	11	0	6	38	9	0	13	58	18	0	203	0	3	3	0
4:20 PM	4	10	7	0	11	22	12	0	2	39	3	0	7	38	5	0	160	0	0	1	0
4:25 PM	4	10	2	0	12	19	5	0	5	28	6	0	12	38	7	0	148	1	2	0	0
4:30 PM	9	11	6	0	12	19	5	0	7	25	4	0	12	38	7	0	155	0	0	0	0
4:35 PM	6	19	3	0	3	17	6	0	5	32	5	0	6	56	12	0	170	0	0	0	0
4:40 PM	6	14	4	0	11	31	8	0	5	29	7	0	11	28	11	2	165	0	0	1	0
4:45 PM	3	5	4	0	16	18	6	0	7	35	10	0	4	61	12	0	181	0	1	1	0
4:50 PM	1	21	12	0	11	24	8	0	8	34	5	0	9	60	14	0	207	0	1	0	1
4:55 PM	8	19	9	0	12	18	10	0	8	34	5	0	4	44	20	0	191	0	2	0	2
5:00 PM	7	11	2	0	12	33	12	0	11	19	3	0	13	45	6	0	174	0	0	0	3
5:05 PM	5	12	2	0	10	24	12	1	4	35	9	0	18	78	15	0	224	1	0	0	1
5:10 PM	12	12	6	0	12	37	13	0	2	21	2	0	14	43	20	0	194	1	1	0	1
5:15 PM	8	11	6	0	9	25	12	0	7	38	9	0	10	59	12	0	206	0	1	1	0
5:20 PM	4	17	11	0	20	28	13	0	8	22	11	0	6	52	16	0	208	0	0	0	0
5:25 PM	4	5	7	0	10	16	3	2	9	39	10	0	11	48	10	0	172	0	1	0	0
5:30 PM	4	13	9	0	13	24	2	0	5	35	6	0	13	41	8	0	173	0	1	1	2
5:35 PM	6	21	3	0	9	22	4	0	4	38	6	0	12	69	19	0	213	0	2	0	0
5:40 PM	5	9	8	0	13	18	7	0	4	35	8	0	11	62	14	0	194	0	2	0	0
5:45 PM	9	5	2	0	10	14	10	0	3	36	10	0	12	56	11	0	178	0	0	0	0
5:50 PM	6	17	5	0	6	21	11	0	4	32	10	0	9	44	17	0	182	0	0	0	0
5:55 PM	10	6	11	0	11	28	10	0	4	29	8	0	7	38	9	0	171	0	1	0	0
Total Survey	146	284	145	0	275	540	216	3	131	777	173	1	249	1,179	298	2	4,413	4	20	9	14

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	20	30	21	0	39	61	36	0	13	104	27	1	35	123	35	0	544	1	2	1	4
4:15 PM	13	26	14	0	36	62	28	0	13	105	18	0	32	134	30	0	511	1	5	4	0
4:30 PM	21	44	13	0	26	67	19	0	17	86	16	0	29	122	30	2	490	0	0	1	0
4:45 PM	12	45	25	0	39	60	24	0	23	103	20	0	17	165	46	0	579	0	4	1	3
5:00 PM	24	35	10	0	34	94	37	1	17	75	14	0	45	166	41	0	592	2	1	0	5
5:15 PM	16	33	24	0	39	69	28	2	24	99	30	0	27	159	38	0	586	0	2	1	0
5:30 PM	15	43	20	0	35	64	13	0	13	108	20	0	36	172	41	0	580	0	5	1	2
5:45 PM	25	28	18	0	27	63	31	0	11	97	28	0	28	138	37	0	531	0	1	0	0
Total Survey	146	284	145	0	275	540	216	3	131	777	173	1	249	1,179	298	2	4,413	4	20	9	14

Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	302	496	798	0	536	399	935	3	546	831	1,377	0	953	611	1,564	0	2,337	2	12	3	10
%HV	1.0%				1.5%				2.4%				1.3%				1.5%				
PHF	0.84				0.79				0.89				0.89				0.94				

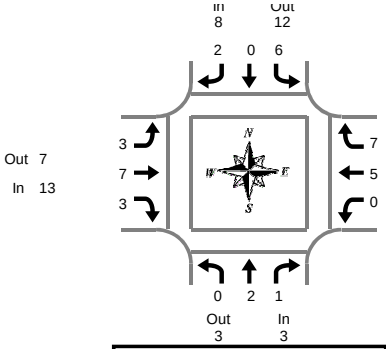
By Movement	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	67	156	79	302	147	287	102	536	77	385	84	546	125	662	166	953	2,337
%HV	0.0%	1.3%	1.3%	1.0%	4.1%	0.0%	2.0%	1.5%	3.9%	1.8%	3.6%	2.4%	0.0%	0.8%	4.2%	1.3%	1.5%
PHF	0.67	0.76	0.73	0.84	0.85	0.76	0.67	0.79	0.71	0.86	0.70	0.89	0.69	0.92	0.86	0.89	0.94

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	66	145	73	0	140	250	107	0	66	398	81	1	113	544	141	2	2,124	2	11	7	7
4:15 PM	70	150	62	0	135	283	108	1	70	369	68	0	123	587	147	2	2,172	3	10	6	8
4:30 PM	73	157	72	0	138	290	108	3	81	363	80	0	118	612	155	2	2,247	2	7	3	8
4:45 PM	67	156	79	0	147	287	102	3	77	385	84	0	125	662	166	0	2,337	2	12	3	10
5:00 PM	80	139	72	0	135	290	109	3	65	379	92	0	136	635	157	0	2,289	2	9	2	7

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Leland Rd & Warner Parrott Rd

Tuesday, April 04, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:45 PM to 5:45 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	1	2	3	0	0	1	1	4
4:05 PM	0	1	0	1	1	1	0	2	0	1	1	2	1	0	0	1	6
4:10 PM	0	0	0	0	0	1	1	2	0	1	0	1	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	2	3	4
4:20 PM	0	1	0	1	1	1	0	2	0	0	0	0	0	2	0	2	5
4:25 PM	0	0	0	0	1	1	0	2	0	0	1	1	0	0	0	0	3
4:30 PM	0	1	2	3	1	0	0	1	1	1	1	3	0	0	0	0	7
4:35 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
4:40 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	1	1	2	4
4:45 PM	0	0	1	1	0	0	1	1	0	0	1	1	0	0	0	0	3
4:50 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:55 PM	0	1	0	1	1	0	0	1	0	3	0	3	0	0	4	4	9
5:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	2
5:05 PM	0	0	0	0	1	0	0	1	1	1	0	2	0	1	0	1	4
5:10 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	1	0	1	3
5:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	2
5:20 PM	0	0	0	0	0	0	1	1	0	0	1	1	0	2	0	2	4
5:25 PM	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	1	2	0	3	0	0	1	1	4
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
5:45 PM	0	0	0	0	0	0	0	0	0	1	1	2	0	0	1	1	3
5:50 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
5:55 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Survey	0	6	3	9	12	4	3	19	4	15	9	28	1	10	12	23	79

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	1	2	1	4	0	3	3	6	1	0	1	2	13
4:15 PM	0	1	0	1	2	2	0	4	0	1	1	2	0	3	2	5	12
4:30 PM	0	2	2	4	2	0	0	2	1	2	1	4	0	2	1	3	13
4:45 PM	0	2	1	3	1	0	1	2	0	3	1	4	0	0	4	4	13
5:00 PM	0	0	0	0	3	0	0	3	2	1	0	3	0	2	1	3	9
5:15 PM	0	0	0	0	2	0	1	3	0	0	2	2	0	2	1	3	8
5:30 PM	0	0	0	0	0	0	0	0	1	3	0	4	0	1	1	2	6
5:45 PM	0	0	0	0	1	0	0	1	0	2	1	3	0	0	1	1	5
Total Survey	0	6	3	9	12	4	3	19	4	15	9	28	1	10	12	23	79

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound Leland Rd			Southbound Leland Rd			Eastbound Warner Parrott Rd			Westbound Warner Parrott Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	3	6	8	12	20	13	7	20	12	14	26	36
PHF	0.25			0.50			0.54			0.50			0.60

By Movement	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	2	1	3	6	0	2	8	3	7	3	13	0	5	7	12	36
PHF	0.00	0.25	0.25	0.25	0.38	0.00	0.50	0.50	0.38	0.44	0.38	0.54	0.00	0.42	0.35	0.50	0.60

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

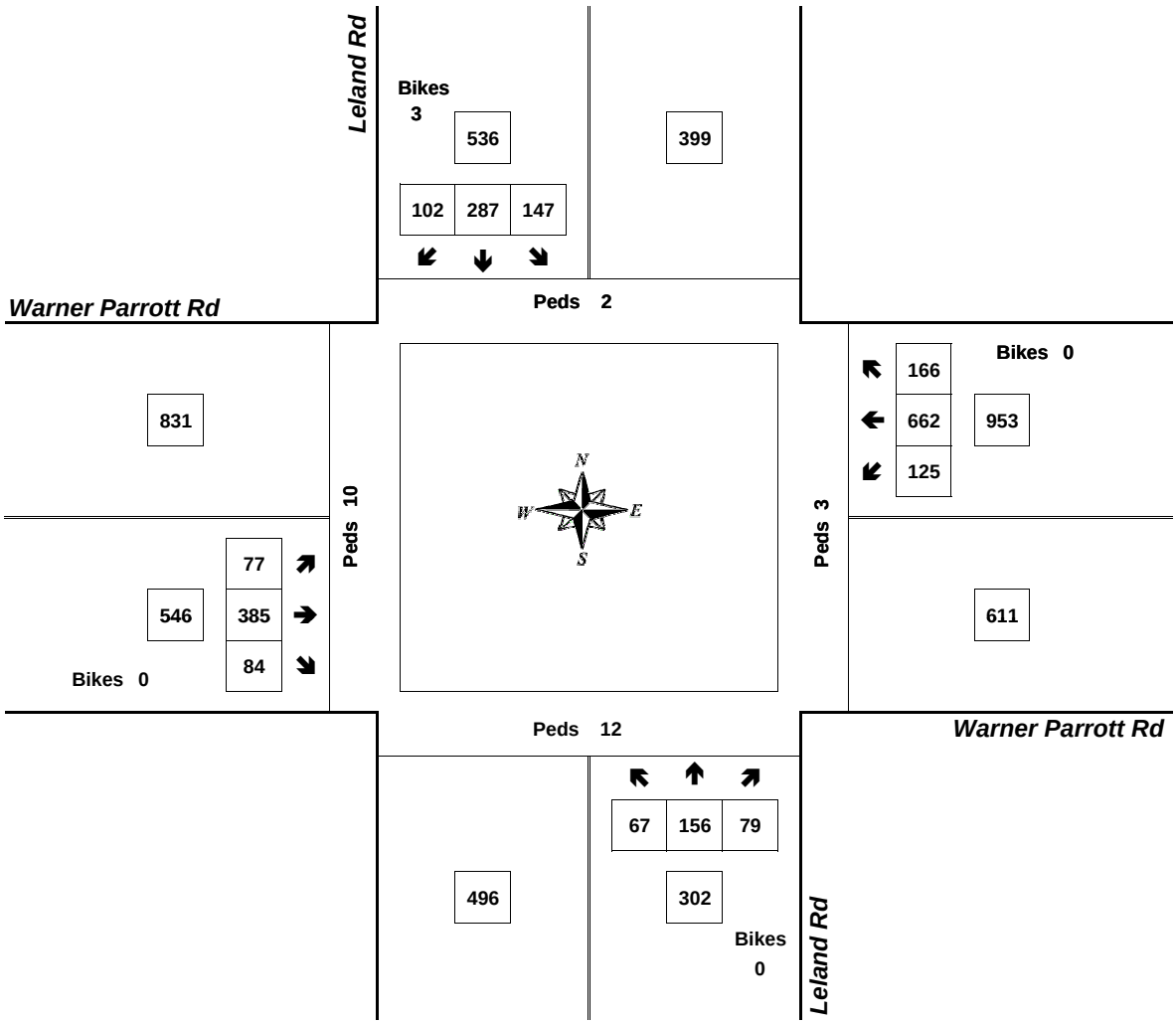
Interval Start Time	Northbound Leland Rd				Southbound Leland Rd				Eastbound Warner Parrott Rd				Westbound Warner Parrott Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	6	3	9	6	4	2	12	1	9	6	16	1	5	8	14	51
4:15 PM	0	5	3	8	8	2	1	11	3	7	3	13	0	7	8	15	47
4:30 PM	0	4	3	7	8	0	2	10	3	6	4	13	0	6	7	13	43
4:45 PM	0	2	1	3	6	0	2	8	3	7	3	13	0	5	7	12	36
5:00 PM	0	0	0	0	6	0	1	7	3	6	3	12	0	5	4	9	28

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Leland Rd & Warner Parrott Rd

4:45 PM to 5:45 PM
Tuesday, April 04, 2017



Approach	PHF	HV%	Volume
EB	0.89	2.4%	546
WB	0.89	1.3%	953
NB	0.84	1.0%	302
SB	0.79	1.5%	536
Intersection	0.94	1.5%	2,337

Count Period: 4:00 PM to 6:00 PM

TRIP GENERATION CALCULATIONS

Land Use:	**Single-Family Detached Housing**
Land Use Code:	210
Variable:	Dwelling Units
Variable Value:	77

AM PEAK HOUR

Trip Rate: 0.75

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	**15**	**43**	**58**

PM PEAK HOUR

Trip Rate: 1.00

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	**49**	**28**	**77**

WEEKDAY

Trip Rate: 9.52

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**367**	**367**	**734**

SATURDAY

Trip Rate: 9.91

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**382**	**382**	**764**

Source: TRIP GENERATION, Ninth Edition

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Variable: Dwelling Units
Variable Value: 84

AM PEAK HOUR

Trip Rate: 0.75

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	**16**	**47**	**63**

PM PEAK HOUR

Trip Rate: 1.00

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	**53**	**31**	**84**

WEEKDAY

Trip Rate: 9.52

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**400**	**400**	**800**

SATURDAY

Trip Rate: 9.91

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**416**	**416**	**832**

Source: TRIP GENERATION, Ninth Edition

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Variable: Dwelling Units
Variable Value: 73

AM PEAK HOUR

Trip Rate: 0.75

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	**14**	**41**	**55**

PM PEAK HOUR

Trip Rate: 1.00

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	**46**	**27**	**73**

WEEKDAY

Trip Rate: 9.52

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**347**	**347**	**694**

SATURDAY

Trip Rate: 9.91

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**362**	**362**	**724**

Source: TRIP GENERATION, Ninth Edition

LEVEL OF SERVICE

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

Level of service A: Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

Level of service B: Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

Level of service C: Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

Level of service D: Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

Level of service E: Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

Level of service F: Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

LEVEL OF SERVICE CRITERIA
FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

LEVEL OF SERVICE CRITERIA
FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

Intersection	
Int Delay, s/veh	1.7

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	19	21	132	2	7	81
Future Vol, veh/h	19	21	132	2	7	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	2	2	5	5
Mvmt Flow	24	26	165	3	9	101

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	285	166	0	0	168	0
Stage 1	166	-	-	-	-	-
Stage 2	119	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.15	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.245	-
Pot Cap-1 Maneuver	710	884	-	-	1392	-
Stage 1	868	-	-	-	-	-
Stage 2	911	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	705	884	-	-	1392	-
Mov Cap-2 Maneuver	705	-	-	-	-	-
Stage 1	868	-	-	-	-	-
Stage 2	905	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	9.9	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	789	1392	-
HCM Lane V/C Ratio	-	-	0.063	0.006	-
HCM Control Delay (s)	-	-	9.9	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	0	5	0	0	2	2	155	0	4	85	43
Future Vol, veh/h	31	0	5	0	0	2	2	155	0	4	85	43
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	3	3	3
Mvmt Flow	40	0	6	0	0	3	3	199	0	5	109	55

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	353	353	138	355	380	200	165	0	0	200	0	0
Stage 1	148	148	-	205	205	-	-	-	-	-	-	-
Stage 2	205	205	-	150	175	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	606	575	916	604	556	846	1419	-	-	1366	-	-
Stage 1	859	779	-	802	736	-	-	-	-	-	-	-
Stage 2	802	736	-	857	758	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	601	570	915	596	552	845	1419	-	-	1366	-	-
Mov Cap-2 Maneuver	601	570	-	596	552	-	-	-	-	-	-	-
Stage 1	856	775	-	800	734	-	-	-	-	-	-	-
Stage 2	798	734	-	848	754	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	11.2	9.3	0.1	0.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1419	-	-	845	631	1366	-	-
HCM Lane V/C Ratio	0.002	-	-	0.003	0.073	0.004	-	-
HCM Control Delay (s)	7.5	0	-	9.3	11.2	7.6	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	9	3	10	1	20	0	187	2	8	122	3
Future Vol, veh/h	6	9	3	10	1	20	0	187	2	8	122	3
Conflicting Peds, #/hr	5	0	0	0	0	5	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	3	3	3	1	1	1	5	5	5
Mvmt Flow	8	11	4	13	1	25	0	237	3	10	154	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	434	417	157	422	417	243	159	0	0	239	0	0
Stage 1	178	178	-	238	238	-	-	-	-	-	-	-
Stage 2	256	239	-	184	179	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.53	6.23	4.11	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4.027	3.327	2.209	-	-	2.245	-	-
Pot Cap-1 Maneuver	536	530	894	540	525	793	1427	-	-	1310	-	-
Stage 1	828	756	-	763	706	-	-	-	-	-	-	-
Stage 2	753	711	-	815	749	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	512	525	893	526	520	789	1427	-	-	1304	-	-
Mov Cap-2 Maneuver	512	525	-	526	520	-	-	-	-	-	-	-
Stage 1	827	749	-	763	706	-	-	-	-	-	-	-
Stage 2	724	711	-	793	742	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	11.7	10.7	0	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1427	-	-	670	559	1304	-	-
HCM Lane V/C Ratio	-	-	-	0.059	0.041	0.008	-	-
HCM Control Delay (s)	0	-	-	10.7	11.7	7.8	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

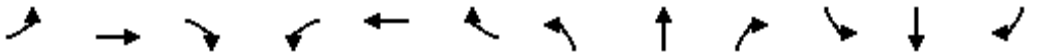
Intersection	
Int Delay, s/veh	5.3

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	358	6	90	191	43	297
Future Vol, veh/h	358	6	90	191	43	297
Conflicting Peds, #/hr	0	3	3	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	140	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	6	6	1	1
Mvmt Flow	381	6	96	203	46	316

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	390	0	784	197
Stage 1	-	-	-	-	387	-
Stage 2	-	-	-	-	397	-
Critical Hdwy	-	-	4.19	-	7.315	6.915
Critical Hdwy Stg 1	-	-	-	-	6.515	-
Critical Hdwy Stg 2	-	-	-	-	6.115	-
Follow-up Hdwy	-	-	2.257	-	3.5095	3.3095
Pot Cap-1 Maneuver	-	-	1142	-	298	815
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	630	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1142	-	278	813
Mov Cap-2 Maneuver	-	-	-	-	278	-
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	576	-

Approach	EB	WB	NE
HCM Control Delay, s	0	2.7	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	278	813	-	-	1142	-
HCM Lane V/C Ratio	0.165	0.389	-	-	0.084	-
HCM Control Delay (s)	20.5	12.2	-	-	8.4	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	1.9	-	-	0.3	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	388	54	32	183	76	73	317	85	111	113	56
Future Volume (vph)	147	388	54	32	183	76	73	317	85	111	113	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		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	0.98		1.00	0.96		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1815		1671	3151		1736	1750		1703	1681	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1815		1671	3151		1736	1750		1703	1681	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	158	417	58	34	197	82	78	341	91	119	122	60
RTOR Reduction (vph)	0	4	0	0	39	0	0	7	0	0	13	0
Lane Group Flow (vph)	158	471	0	34	240	0	78	425	0	119	169	0
Confl. Peds. (#/hr)	9		14	14		9	16		10	10		16
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.4	32.7		3.0	21.3		8.3	44.5		11.5	47.7	
Effective Green, g (s)	14.4	32.7		3.0	21.3		8.3	44.5		11.5	47.7	
Actuated g/C Ratio	0.13	0.30		0.03	0.19		0.08	0.41		0.10	0.43	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	232	541		45	611		131	709		178	730	
v/s Ratio Prot	c0.09	c0.26		0.02	0.08		0.04	c0.24		c0.07	c0.10	
v/s Ratio Perm												
v/c Ratio	0.68	0.87		0.76	0.39		0.60	0.60		0.67	0.23	
Uniform Delay, d1	45.5	36.5		53.0	38.6		49.1	25.6		47.3	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.0	14.2		51.4	0.4		7.1	3.7		9.1	0.7	
Delay (s)	53.4	50.7		104.4	39.0		56.2	29.3		56.4	20.2	
Level of Service	D	D		F	D		E	C		E	C	
Approach Delay (s)		51.4			46.1			33.4			34.5	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	109.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.8

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	1	7	103	1	19	144
Future Vol, veh/h	1	7	103	1	19	144
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	5	5	1	1
Mvmt Flow	1	8	123	1	23	171

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	340	123	0	0	124	0
Stage 1	123	-	-	-	-	-
Stage 2	217	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	660	933	-	-	1469	-
Stage 1	907	-	-	-	-	-
Stage 2	824	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	649	933	-	-	1469	-
Mov Cap-2 Maneuver	649	-	-	-	-	-
Stage 1	907	-	-	-	-	-
Stage 2	810	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	9.1	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	885	1469	-
HCM Lane V/C Ratio	-	-	0.011	0.015	-
HCM Control Delay (s)	-	-	9.1	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	0	2	0	1	0	2	115	0	0	174	25
Future Vol, veh/h	17	0	2	0	1	0	2	115	0	0	174	25
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	3	3	3
Mvmt Flow	21	0	2	0	1	0	2	140	0	0	212	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	374	373	228	374	389	140	244	0	0	140	0	0
Stage 1	228	228	-	145	145	-	-	-	-	-	-	-
Stage 2	146	145	-	229	244	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	587	561	816	587	549	913	1328	-	-	1437	-	-
Stage 1	779	719	-	863	781	-	-	-	-	-	-	-
Stage 2	861	781	-	778	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	585	559	815	584	547	913	1328	-	-	1437	-	-
Mov Cap-2 Maneuver	585	559	-	584	547	-	-	-	-	-	-	-
Stage 1	777	718	-	861	779	-	-	-	-	-	-	-
Stage 2	858	779	-	776	707	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	11.2	11.6	0.1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1328	-	-	547	603	1437	-	-
HCM Lane V/C Ratio	0.002	-	-	0.002	0.038	-	-	-
HCM Control Delay (s)	7.7	0	-	11.6	11.2	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	9	2	3	1	9	0	129	3	24	197	9
Future Vol, veh/h	5	9	2	3	1	9	0	129	3	24	197	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	1	1	1
Mvmt Flow	6	11	2	4	1	11	0	152	4	28	232	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	453	450	237	455	454	155	242	0	0	156	0	0
Stage 1	294	294	-	155	155	-	-	-	-	-	-	-
Stage 2	159	156	-	300	299	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.14	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.236	-	-	2.209	-	-
Pot Cap-1 Maneuver	520	508	807	519	505	896	1313	-	-	1430	-	-
Stage 1	719	673	-	852	773	-	-	-	-	-	-	-
Stage 2	848	772	-	713	670	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	504	496	807	500	493	895	1313	-	-	1430	-	-
Mov Cap-2 Maneuver	504	496	-	500	493	-	-	-	-	-	-	-
Stage 1	719	658	-	851	772	-	-	-	-	-	-	-
Stage 2	837	771	-	683	655	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	12.1	10.1	0	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1313	-	-	719	524	1430	-	-
HCM Lane V/C Ratio	-	-	-	0.021	0.036	0.02	-	-
HCM Control Delay (s)	0	-	-	10.1	12.1	7.6	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.1	-	-

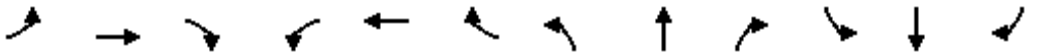
Intersection	
Int Delay, s/veh	5.8

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	342	26	399	430	18	202
Future Vol, veh/h	342	26	399	430	18	202
Conflicting Peds, #/hr	0	7	7	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	140	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	1	1	3	3
Mvmt Flow	360	27	420	453	19	213

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	394	0	1676	201
Stage 1	-	-	-	-	381	-
Stage 2	-	-	-	-	1295	-
Critical Hdwy	-	-	4.115	-	7.345	6.945
Critical Hdwy Stg 1	-	-	-	-	6.545	-
Critical Hdwy Stg 2	-	-	-	-	6.145	-
Follow-up Hdwy	-	-	2.2095	-	3.5285	3.3285
Pot Cap-1 Maneuver	-	-	1169	-	68	804
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	197	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1169	-	49	799
Mov Cap-2 Maneuver	-	-	-	-	49	-
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	126	-

Approach	EB	WB	NE
HCM Control Delay, s	0	4.7	19.9
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	49	799	-	-	1169	-
HCM Lane V/C Ratio	0.387	0.266	-	-	0.359	-
HCM Control Delay (s)	118.9	11.1	-	-	9.8	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	1.4	1.1	-	-	1.7	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	394	86	125	662	166	67	156	79	147	287	102
Future Volume (vph)	78	394	86	125	662	166	67	156	79	147	287	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		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	0.97		1.00	0.97		1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1798		1787	3450		1787	1770		1770	1776	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1798		1787	3450		1787	1770		1770	1776	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	83	419	91	133	704	177	71	166	84	156	305	109
RTOR Reduction (vph)	0	10	0	0	27	0	0	22	0	0	15	0
Lane Group Flow (vph)	83	500	0	133	854	0	71	228	0	156	399	0
Confl. Peds. (#/hr)	2		12	12		2	10		3	3		10
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.3	24.6		7.5	26.8		4.4	22.5		8.5	26.6	
Effective Green, g (s)	5.3	24.6		7.5	26.8		4.4	22.5		8.5	26.6	
Actuated g/C Ratio	0.07	0.30		0.09	0.33		0.05	0.28		0.10	0.33	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	115	545		165	1140		96	491		185	582	
v/s Ratio Prot	0.05	c0.28		c0.07	0.25		0.04	0.13		c0.09	c0.22	
v/s Ratio Perm												
v/c Ratio	0.72	0.92		0.81	0.75		0.74	0.46		0.84	0.68	
Uniform Delay, d1	37.2	27.3		36.1	24.2		37.8	24.3		35.6	23.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.9	20.4		24.1	2.7		25.5	3.1		27.9	6.4	
Delay (s)	57.1	47.6		60.2	26.9		63.2	27.4		63.5	30.0	
Level of Service	E	D		E	C		E	C		E	C	
Approach Delay (s)		49.0			31.3			35.3			39.2	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	37.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	81.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.1

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	1	22	137	2	7	84
Future Vol, veh/h	1	22	137	2	7	84
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	2	2	5	5
Mvmt Flow	1	28	171	3	9	105

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	296	174	0	0	174	0
Stage 1	173	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.15	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.245	-
Pot Cap-1 Maneuver	699	875	-	-	1385	-
Stage 1	862	-	-	-	-	-
Stage 2	907	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	694	874	-	-	1384	-
Mov Cap-2 Maneuver	694	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	901	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	9.3	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	864	1384	-
HCM Lane V/C Ratio	-	-	0.033	0.006	-
HCM Control Delay (s)	-	-	9.3	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	0	5	2	2	20	2	161	0	7	88	45
Future Vol, veh/h	31	0	5	2	2	20	2	161	0	7	88	45
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	3	3	3
Mvmt Flow	40	0	6	3	3	26	3	206	0	9	113	58

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	387	374	143	376	402	207	172	0	0	207	0	0
Stage 1	161	161	-	213	213	-	-	-	-	-	-	-
Stage 2	226	213	-	163	189	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	575	560	910	585	540	839	1411	-	-	1358	-	-
Stage 1	846	769	-	794	730	-	-	-	-	-	-	-
Stage 2	781	730	-	844	748	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	551	554	909	576	534	838	1411	-	-	1358	-	-
Mov Cap-2 Maneuver	551	554	-	576	534	-	-	-	-	-	-	-
Stage 1	844	763	-	792	728	-	-	-	-	-	-	-
Stage 2	753	728	-	832	742	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	11.7	9.9	0.1	0.4
HCM LOS	B	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1411	-	-	772	583	1358	-	-
HCM Lane V/C Ratio	0.002	-	-	0.04	0.079	0.007	-	-
HCM Control Delay (s)	7.6	0	-	9.9	11.7	7.7	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	0	1	10	1	21	0	195	2	8	127	3
Future Vol, veh/h	5	0	1	10	1	21	0	195	2	8	127	3
Conflicting Peds, #/hr	5	0	0	0	0	5	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	3	3	3	1	1	1	5	5	5
Mvmt Flow	6	0	1	13	1	27	0	247	3	10	161	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	451	433	164	432	434	253	166	0	0	249	0	0
Stage 1	184	184	-	248	248	-	-	-	-	-	-	-
Stage 2	267	249	-	184	186	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.53	6.23	4.11	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4.027	3.327	2.209	-	-	2.245	-	-
Pot Cap-1 Maneuver	522	519	886	532	514	783	1418	-	-	1299	-	-
Stage 1	822	751	-	754	699	-	-	-	-	-	-	-
Stage 2	743	704	-	815	744	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	497	514	885	528	509	779	1418	-	-	1293	-	-
Mov Cap-2 Maneuver	497	514	-	528	509	-	-	-	-	-	-	-
Stage 1	821	744	-	754	699	-	-	-	-	-	-	-
Stage 2	713	704	-	807	737	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	11.8	10.7	0	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1418	-	-	669	536	1293	-	-
HCM Lane V/C Ratio	-	-	-	0.061	0.014	0.008	-	-
HCM Control Delay (s)	0	-	-	10.7	11.8	7.8	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0	-	-

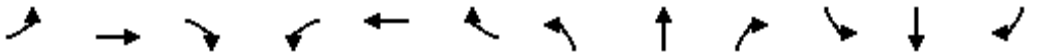
Intersection	
Int Delay, s/veh	5.4

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	361	10	120	199	45	298
Future Vol, veh/h	361	10	120	199	45	298
Conflicting Peds, #/hr	0	3	3	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	140	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	6	6	1	1
Mvmt Flow	384	11	128	212	48	317

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	398	0	861	200
Stage 1	-	-	-	-	392	-
Stage 2	-	-	-	-	469	-
Critical Hdwy	-	-	4.19	-	6.615	6.915
Critical Hdwy Stg 1	-	-	-	-	5.815	-
Critical Hdwy Stg 2	-	-	-	-	5.415	-
Follow-up Hdwy	-	-	2.257	-	3.5095	3.3095
Pot Cap-1 Maneuver	-	-	1134	-	312	811
Stage 1	-	-	-	-	655	-
Stage 2	-	-	-	-	631	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1134	-	275	809
Mov Cap-2 Maneuver	-	-	-	-	275	-
Stage 1	-	-	-	-	653	-
Stage 2	-	-	-	-	559	-

Approach	EB	WB	NE
HCM Control Delay, s	0	3.2	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	275	809	-	-	1134	-
HCM Lane V/C Ratio	0.174	0.392	-	-	0.113	-
HCM Control Delay (s)	20.8	12.3	-	-	8.6	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	1.9	-	-	0.4	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	394	54	35	190	79	76	330	88	115	118	58
Future Volume (vph)	152	394	54	35	190	79	76	330	88	115	118	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		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	0.98		1.00	0.96		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1818		1671	3158		1736	1753		1703	1686	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1818		1671	3158		1736	1753		1703	1686	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	163	424	58	38	204	85	82	355	95	124	127	62
RTOR Reduction (vph)	0	6	0	0	60	0	0	11	0	0	20	0
Lane Group Flow (vph)	163	476	0	38	229	0	82	439	0	124	169	0
Confl. Peds. (#/hr)	9		14	14		9	16		10	10		16
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.1	23.2		2.9	16.0		6.8	26.1		7.6	26.9	
Effective Green, g (s)	10.1	23.2		2.9	16.0		6.8	26.1		7.6	26.9	
Actuated g/C Ratio	0.13	0.30		0.04	0.21		0.09	0.34		0.10	0.35	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	229	542		62	649		151	588		166	582	
v/s Ratio Prot	c0.09	c0.26		0.02	0.07		0.05	c0.25		c0.07	0.10	
v/s Ratio Perm												
v/c Ratio	0.71	0.88		0.61	0.35		0.54	0.75		0.75	0.29	
Uniform Delay, d1	32.5	26.0		36.9	26.5		34.0	22.9		34.2	18.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.0	14.9		16.6	0.3		3.9	8.4		16.6	1.3	
Delay (s)	42.4	40.8		53.5	26.8		38.0	31.3		50.8	19.8	
Level of Service	D	D		D	C		D	C		D	B	
Approach Delay (s)		41.2			29.9			32.3			32.1	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	77.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.8

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	1	7	107	1	20	150
Future Vol, veh/h	1	7	107	1	20	150
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	5	5	1	1
Mvmt Flow	1	9	134	1	25	188

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	372	134	0	0	135	0
Stage 1	134	-	-	-	-	-
Stage 2	238	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	633	920	-	-	1456	-
Stage 1	897	-	-	-	-	-
Stage 2	806	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	621	920	-	-	1456	-
Mov Cap-2 Maneuver	621	-	-	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	791	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	9.2	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	868	1456	-
HCM Lane V/C Ratio	-	-	0.012	0.017	-
HCM Control Delay (s)	-	-	9.2	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	1.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	1	2	1	1	12	2	120	1	23	181	26
Future Vol, veh/h	18	1	2	1	1	12	2	120	1	23	181	26
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	3	3	3
Mvmt Flow	22	1	2	1	1	15	2	146	1	28	221	32

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	454	446	238	447	462	147	253	0	0	148	0	0
Stage 1	294	294	-	152	152	-	-	-	-	-	-	-
Stage 2	160	152	-	295	310	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	520	510	806	525	500	905	1318	-	-	1427	-	-
Stage 1	719	673	-	855	775	-	-	-	-	-	-	-
Stage 2	847	775	-	718	663	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	500	497	805	512	487	905	1318	-	-	1427	-	-
Mov Cap-2 Maneuver	500	497	-	512	487	-	-	-	-	-	-	-
Stage 1	717	657	-	853	773	-	-	-	-	-	-	-
Stage 2	830	773	-	698	647	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	12.3	9.5	0.1	0.8
HCM LOS	B	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1318	-	-	811	519	1427	-	-
HCM Lane V/C Ratio	0.002	-	-	0.021	0.049	0.02	-	-
HCM Control Delay (s)	7.7	0	-	9.5	12.3	7.6	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	0	0	3	1	9	0	134	3	25	205	9
Future Vol, veh/h	4	0	0	3	1	9	0	134	3	25	205	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	1	1	1
Mvmt Flow	5	0	0	4	1	11	0	158	4	29	241	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	470	467	246	465	471	160	252	0	0	162	0	0
Stage 1	305	305	-	160	160	-	-	-	-	-	-	-
Stage 2	165	162	-	305	311	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.14	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.236	-	-	2.209	-	-
Pot Cap-1 Maneuver	507	496	798	511	494	890	1302	-	-	1423	-	-
Stage 1	709	666	-	847	769	-	-	-	-	-	-	-
Stage 2	842	768	-	709	662	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	491	484	798	501	482	889	1302	-	-	1423	-	-
Mov Cap-2 Maneuver	491	484	-	501	482	-	-	-	-	-	-	-
Stage 1	709	650	-	846	768	-	-	-	-	-	-	-
Stage 2	831	767	-	692	646	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	12.4	10.1	0	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1302	-	-	715	491	1423	-	-
HCM Lane V/C Ratio	-	-	-	0.021	0.01	0.021	-	-
HCM Control Delay (s)	0	-	-	10.1	12.4	7.6	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.1	-	-

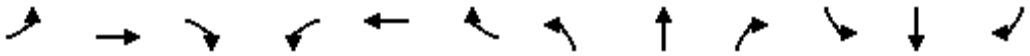
Intersection	
Int Delay, s/veh	5.8

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	356	32	410	440	19	215
Future Vol, veh/h	356	32	410	440	19	215
Conflicting Peds, #/hr	0	7	7	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	140	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	1	1	3	3
Mvmt Flow	375	34	432	463	20	226

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	415	0	1727	211
Stage 1	-	-	-	-	399	-
Stage 2	-	-	-	-	1328	-
Critical Hdwy	-	-	4.115	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	5.445	-
Follow-up Hdwy	-	-	2.2095	-	3.5285	3.3285
Pot Cap-1 Maneuver	-	-	1148	-	87	792
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	245	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1148	-	54	787
Mov Cap-2 Maneuver	-	-	-	-	54	-
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	153	-

Approach	EB	WB	NE
HCM Control Delay, s	0	4.8	19.1
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	54	787	-	-	1148	-
HCM Lane V/C Ratio	0.37	0.288	-	-	0.376	-
HCM Control Delay (s)	106.6	11.4	-	-	10	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	1.3	1.2	-	-	1.8	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	401	90	130	689	173	76	162	86	153	299	106
Future Volume (vph)	80	401	90	130	689	173	76	162	86	153	299	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		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	0.97		1.00	0.97		1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1795		1787	3449		1787	1767		1770	1776	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1795		1787	3449		1787	1767		1770	1776	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	427	96	138	733	184	81	172	91	163	318	113
RTOR Reduction (vph)	0	9	0	0	24	0	0	21	0	0	13	0
Lane Group Flow (vph)	85	514	0	138	893	0	81	242	0	163	418	0
Confl. Peds. (#/hr)	2		12	12		2	10		3	3		10
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.7	28.1		9.2	31.6		5.1	23.3		11.1	29.3	
Effective Green, g (s)	5.7	28.1		9.2	31.6		5.1	23.3		11.1	29.3	
Actuated g/C Ratio	0.06	0.31		0.10	0.35		0.06	0.26		0.12	0.33	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	112	562		183	1215		101	458		219	580	
v/s Ratio Prot	0.05	c0.29		c0.08	c0.26		0.05	0.14		c0.09	c0.24	
v/s Ratio Perm												
v/c Ratio	0.76	0.91		0.75	0.74		0.80	0.53		0.74	0.72	
Uniform Delay, d1	41.3	29.6		39.1	25.4		41.8	28.5		37.9	26.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.1	19.5		16.1	2.3		35.2	4.3		12.8	7.5	
Delay (s)	66.4	49.1		55.2	27.7		77.0	32.8		50.8	34.1	
Level of Service	E	D		E	C		E	C		D	C	
Approach Delay (s)		51.6			31.3			43.2			38.7	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	39.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	89.7	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	75.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Intersection	
Int Delay, s/veh	1.1

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	1	23	137	2	9	84
Future Vol, veh/h	1	23	137	2	9	84
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	25	149	2	10	91

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	261	150	0	0	151	0
Stage 1	150	-	-	-	-	-
Stage 2	111	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	728	896	-	-	1430	-
Stage 1	878	-	-	-	-	-
Stage 2	914	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	723	896	-	-	1430	-
Mov Cap-2 Maneuver	723	-	-	-	-	-
Stage 1	878	-	-	-	-	-
Stage 2	908	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	9.2	0	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	887	1430	-
HCM Lane V/C Ratio	-	-	0.029	0.007	-
HCM Control Delay (s)	-	-	9.2	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	3	5	2	4	40	2	162	0	11	95	45
Future Vol, veh/h	31	3	5	2	4	40	2	162	0	11	95	45
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	3	3	3
Mvmt Flow	40	4	6	3	5	51	3	208	0	14	122	58

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	421	394	152	398	423	209	180	0	0	209	0	0
Stage 1	180	180	-	214	214	-	-	-	-	-	-	-
Stage 2	241	214	-	184	209	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	546	546	900	566	526	836	1402	-	-	1356	-	-
Stage 1	826	754	-	793	729	-	-	-	-	-	-	-
Stage 2	767	729	-	822	733	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	503	537	899	552	518	835	1402	-	-	1356	-	-
Mov Cap-2 Maneuver	503	537	-	552	518	-	-	-	-	-	-	-
Stage 1	824	744	-	791	727	-	-	-	-	-	-	-
Stage 2	713	727	-	802	724	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	12.4	10	0.1	0.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1402	-	-	776	536	1356	-	-
HCM Lane V/C Ratio	0.002	-	-	0.076	0.093	0.01	-	-
HCM Control Delay (s)	7.6	0	-	10	12.4	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	0	1	10	1	39	0	216	2	13	136	3
Future Vol, veh/h	5	0	1	10	1	39	0	216	2	13	136	3
Conflicting Peds, #/hr	5	0	0	0	0	5	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	3	3	3	1	1	1	5	5	5
Mvmt Flow	6	0	1	13	1	49	0	273	3	16	172	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	513	484	175	483	485	280	177	0	0	276	0	0
Stage 1	208	208	-	275	275	-	-	-	-	-	-	-
Stage 2	305	276	-	208	210	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.53	6.23	4.11	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4.027	3.327	2.209	-	-	2.245	-	-
Pot Cap-1 Maneuver	475	486	874	492	481	756	1405	-	-	1270	-	-
Stage 1	799	734	-	729	681	-	-	-	-	-	-	-
Stage 2	709	685	-	792	727	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	436	479	873	486	474	752	1405	-	-	1264	-	-
Mov Cap-2 Maneuver	436	479	-	486	474	-	-	-	-	-	-	-
Stage 1	798	723	-	729	681	-	-	-	-	-	-	-
Stage 2	658	685	-	780	716	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	12.7	10.9	0	0.7
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1405	-	-	671	476	1264	-	-
HCM Lane V/C Ratio	-	-	-	0.094	0.016	0.013	-	-
HCM Control Delay (s)	0	-	-	10.9	12.7	7.9	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	0	-	-

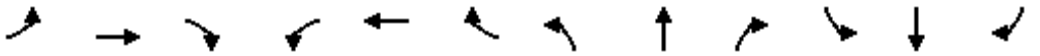
Intersection	
Int Delay, s/veh	5.8

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	361	11	127	199	47	316
Future Vol, veh/h	361	11	127	199	47	316
Conflicting Peds, #/hr	0	3	3	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	140	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	6	6	1	1
Mvmt Flow	384	12	135	212	50	336

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	399	0	877	201
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	484	-
Critical Hdwy	-	-	4.19	-	6.615	6.915
Critical Hdwy Stg 1	-	-	-	-	5.815	-
Critical Hdwy Stg 2	-	-	-	-	5.415	-
Follow-up Hdwy	-	-	2.257	-	3.5095	3.3095
Pot Cap-1 Maneuver	-	-	1133	-	305	810
Stage 1	-	-	-	-	654	-
Stage 2	-	-	-	-	621	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1133	-	267	808
Mov Cap-2 Maneuver	-	-	-	-	267	-
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	546	-

Approach	EB	WB	NE
HCM Control Delay, s	0	3.4	13.8
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	267	808	-	-	1133	-
HCM Lane V/C Ratio	0.187	0.416	-	-	0.119	-
HCM Control Delay (s)	21.6	12.6	-	-	8.6	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	2.1	-	-	0.4	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	404	54	35	194	79	76	330	88	115	118	61
Future Volume (vph)	160	404	54	35	194	79	76	330	88	115	118	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		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	0.98		1.00	0.96		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1819		1671	3161		1736	1753		1703	1681	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1819		1671	3161		1736	1753		1703	1681	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	172	434	58	38	209	85	82	355	95	124	127	66
RTOR Reduction (vph)	0	6	0	0	57	0	0	11	0	0	22	0
Lane Group Flow (vph)	172	486	0	38	237	0	82	439	0	124	171	0
Confl. Peds. (#/hr)	3		14	14		9	16		10	10		16
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.5	23.4		2.9	15.8		6.8	26.0		7.6	26.8	
Effective Green, g (s)	10.5	23.4		2.9	15.8		6.8	26.0		7.6	26.8	
Actuated g/C Ratio	0.13	0.30		0.04	0.20		0.09	0.33		0.10	0.34	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	238	546		62	641		151	585		166	578	
v/s Ratio Prot	c0.10	c0.27		0.02	0.08		0.05	c0.25		c0.07	0.10	
v/s Ratio Perm												
v/c Ratio	0.72	0.89		0.61	0.37		0.54	0.75		0.75	0.30	
Uniform Delay, d1	32.3	26.0		36.9	26.8		34.1	23.1		34.2	18.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.3	16.2		16.6	0.4		3.9	8.6		16.6	1.3	
Delay (s)	42.6	42.2		53.6	27.1		38.0	31.6		50.9	20.0	
Level of Service	D	D		D	C		D	C		D	B	
Approach Delay (s)		42.3			30.2			32.6			32.1	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	77.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.9

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	1	9	107	1	22	150
Future Vol, veh/h	1	9	107	1	22	150
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	5	5	1	1
Mvmt Flow	1	11	127	1	26	179

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	359	128	0	0	129	0
Stage 1	128	-	-	-	-	-
Stage 2	231	-	-	-	-	-
Critical Hdwy	7.1	6.2	-	-	4.11	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	600	927	-	-	1463	-
Stage 1	881	-	-	-	-	-
Stage 2	776	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	591	927	-	-	1463	-
Mov Cap-2 Maneuver	591	-	-	-	-	-
Stage 1	881	-	-	-	-	-
Stage 2	760	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	9.2	0	1
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	877	1463	-
HCM Lane V/C Ratio	-	-	0.014	0.018	-
HCM Control Delay (s)	-	-	9.2	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	2.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	4	2	1	2	30	2	122	1	49	183	26
Future Vol, veh/h	18	4	2	1	2	30	2	122	1	49	183	26
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	3	3	3
Mvmt Flow	22	5	2	1	2	37	2	149	1	60	223	32

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	534	515	240	516	529	149	256	0	0	150	0	0
Stage 1	360	360	-	154	154	-	-	-	-	-	-	-
Stage 2	174	155	-	362	375	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	460	466	804	473	458	903	1315	-	-	1425	-	-
Stage 1	662	630	-	853	774	-	-	-	-	-	-	-
Stage 2	833	773	-	661	621	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	422	442	803	449	434	903	1315	-	-	1425	-	-
Mov Cap-2 Maneuver	422	442	-	449	434	-	-	-	-	-	-	-
Stage 1	660	599	-	851	772	-	-	-	-	-	-	-
Stage 2	795	771	-	622	590	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	13.7	9.6	0.1	1.5
HCM LOS	B	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1315	-	-	824	443	1425	-	-
HCM Lane V/C Ratio	0.002	-	-	0.049	0.066	0.042	-	-
HCM Control Delay (s)	7.7	0	-	9.6	13.7	7.6	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	0	0	3	1	14	1	159	10	40	233	9
Future Vol, veh/h	4	0	0	3	1	14	1	159	10	40	233	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	1	1	1
Mvmt Flow	5	0	0	4	1	16	1	187	12	47	274	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	578	576	279	570	575	194	285	0	0	200	0	0
Stage 1	374	374	-	196	196	-	-	-	-	-	-	-
Stage 2	204	202	-	374	379	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.14	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.236	-	-	2.209	-	-
Pot Cap-1 Maneuver	430	431	765	435	431	853	1266	-	-	1378	-	-
Stage 1	651	621	-	810	742	-	-	-	-	-	-	-
Stage 2	803	738	-	651	618	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	407	413	765	421	413	852	1266	-	-	1378	-	-
Mov Cap-2 Maneuver	407	413	-	421	413	-	-	-	-	-	-	-
Stage 1	650	596	-	808	741	-	-	-	-	-	-	-
Stage 2	785	737	-	624	593	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	13.9	10.4	0	1.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1266	-	-	693	407	1378	-	-
HCM Lane V/C Ratio	0.001	-	-	0.031	0.012	0.034	-	-
HCM Control Delay (s)	7.8	0	-	10.4	13.9	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.1	-	-

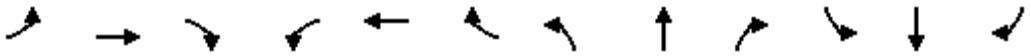
Intersection	
Int Delay, s/veh	6.4

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	356	35	430	440	21	226
Future Vol, veh/h	356	35	430	440	21	226
Conflicting Peds, #/hr	0	7	7	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	140	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	1	1	3	3
Mvmt Flow	375	37	453	463	22	238

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	419	0	1770	213
Stage 1	-	-	-	-	400	-
Stage 2	-	-	-	-	1370	-
Critical Hdwy	-	-	4.115	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	5.445	-
Follow-up Hdwy	-	-	2.2095	-	3.5285	3.3285
Pot Cap-1 Maneuver	-	-	1145	-	82	790
Stage 1	-	-	-	-	644	-
Stage 2	-	-	-	-	233	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1145	-	49	785
Mov Cap-2 Maneuver	-	-	-	-	49	-
Stage 1	-	-	-	-	640	-
Stage 2	-	-	-	-	141	-

Approach	EB	WB	NE
HCM Control Delay, s	0	5	21.6
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	49	785	-	-	1145	-
HCM Lane V/C Ratio	0.451	0.303	-	-	0.395	-
HCM Control Delay (s)	128.7	11.6	-	-	10.2	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	1.7	1.3	-	-	1.9	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	407	90	130	700	173	76	162	86	153	299	115
Future Volume (vph)	85	407	90	130	700	173	76	162	86	153	299	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		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	0.97		1.00	0.97		1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1796		1787	3451		1787	1767		1770	1771	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1796		1787	3451		1787	1767		1770	1771	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	90	433	96	138	745	184	81	172	91	163	318	122
RTOR Reduction (vph)	0	9	0	0	23	0	0	21	0	0	15	0
Lane Group Flow (vph)	90	520	0	138	906	0	81	242	0	163	425	0
Confl. Peds. (#/hr)	2		12	12		2	10		3	3		10
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.9	27.9		8.5	30.5		4.3	25.0		11.2	31.9	
Effective Green, g (s)	5.9	27.9		8.5	30.5		4.3	25.0		11.2	31.9	
Actuated g/C Ratio	0.07	0.31		0.09	0.34		0.05	0.28		0.12	0.35	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	115	553		167	1161		84	487		218	623	
v/s Ratio Prot	0.05	c0.29		c0.08	c0.26		0.05	0.14		c0.09	c0.24	
v/s Ratio Perm												
v/c Ratio	0.78	0.94		0.83	0.78		0.96	0.50		0.75	0.68	
Uniform Delay, d1	41.7	30.5		40.3	27.0		43.1	27.5		38.3	25.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	28.5	24.3		27.1	3.5		85.6	3.6		13.1	6.0	
Delay (s)	70.2	54.9		67.4	30.5		128.7	31.1		51.4	31.0	
Level of Service	E	D		E	C		F	C		D	C	
Approach Delay (s)		57.1			35.3			54.1			36.5	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.1

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	1	30	189	3	10	116
Future Vol, veh/h	1	30	189	3	10	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	38	236	4	13	145

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	408	238	0	0	240	0
Stage 1	238	-	-	-	-	-
Stage 2	170	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	599	801	-	-	1327	-
Stage 1	802	-	-	-	-	-
Stage 2	860	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	592	801	-	-	1327	-
Mov Cap-2 Maneuver	592	-	-	-	-	-
Stage 1	802	-	-	-	-	-
Stage 2	851	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	9.8	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	792	1327	-
HCM Lane V/C Ratio	-	-	0.049	0.009	-
HCM Control Delay (s)	-	-	9.8	7.7	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	2.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	43	0	7	3	3	29	3	222	0	6	122	62
Future Vol, veh/h	43	0	7	3	3	29	3	222	0	6	122	62
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	3	3	3
Mvmt Flow	55	0	9	4	4	37	4	285	0	8	156	79

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	526	506	197	509	545	286	237	0	0	286	0	0
Stage 1	213	213	-	293	293	-	-	-	-	-	-	-
Stage 2	313	293	-	216	252	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	466	472	849	478	449	758	1336	-	-	1270	-	-
Stage 1	794	730	-	719	674	-	-	-	-	-	-	-
Stage 2	702	674	-	791	702	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	436	466	848	469	443	757	1336	-	-	1270	-	-
Mov Cap-2 Maneuver	436	466	-	469	443	-	-	-	-	-	-	-
Stage 1	790	724	-	715	671	-	-	-	-	-	-	-
Stage 2	661	671	-	777	696	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	13.9	10.7	0.1	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1336	-	-	680	468	1270	-	-
HCM Lane V/C Ratio	0.003	-	-	0.066	0.137	0.006	-	-
HCM Control Delay (s)	7.7	0	-	10.7	13.9	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.5	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	0	1	14	1	29	0	268	3	11	175	4
Future Vol, veh/h	7	0	1	14	1	29	0	268	3	11	175	4
Conflicting Peds, #/hr	5	0	0	0	0	5	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	3	3	3	1	1	1	5	5	5
Mvmt Flow	9	0	1	18	1	37	0	339	4	14	222	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	618	596	225	594	596	346	228	0	0	343	0	0
Stage 1	253	253	-	341	341	-	-	-	-	-	-	-
Stage 2	365	343	-	253	255	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.53	6.23	4.11	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4.027	3.327	2.209	-	-	2.245	-	-
Pot Cap-1 Maneuver	404	420	819	415	416	695	1346	-	-	1199	-	-
Stage 1	756	701	-	672	637	-	-	-	-	-	-	-
Stage 2	658	641	-	749	695	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	376	414	818	410	410	692	1346	-	-	1193	-	-
Mov Cap-2 Maneuver	376	414	-	410	410	-	-	-	-	-	-	-
Stage 1	755	691	-	672	637	-	-	-	-	-	-	-
Stage 2	619	641	-	738	685	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	14.2	12.1	0	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1346	-	-	561	403	1193	-	-
HCM Lane V/C Ratio	-	-	-	0.099	0.025	0.012	-	-
HCM Control Delay (s)	0	-	-	12.1	14.2	8.1	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0	-	-

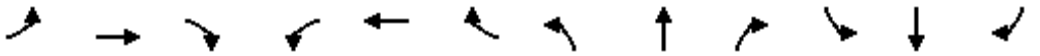
Intersection	
Int Delay, s/veh	7.4

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	497	9	129	274	62	410
Future Vol, veh/h	497	9	129	274	62	410
Conflicting Peds, #/hr	0	3	3	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	140	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	6	6	1	1
Mvmt Flow	529	10	137	291	66	436

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	541	0	1105	272
Stage 1	-	-	-	-	537	-
Stage 2	-	-	-	-	568	-
Critical Hdwy	-	-	4.19	-	6.615	6.915
Critical Hdwy Stg 1	-	-	-	-	5.815	-
Critical Hdwy Stg 2	-	-	-	-	5.415	-
Follow-up Hdwy	-	-	2.257	-	3.5095	3.3095
Pot Cap-1 Maneuver	-	-	1002	-	220	729
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	568	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1002	-	189	727
Mov Cap-2 Maneuver	-	-	-	-	189	-
Stage 1	-	-	-	-	551	-
Stage 2	-	-	-	-	489	-

Approach	EB	WB	NE
HCM Control Delay, s	0	2.9	19.3
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	189	727	-	-	1002	-
HCM Lane V/C Ratio	0.349	0.6	-	-	0.137	-
HCM Control Delay (s)	33.9	17.1	-	-	9.2	-
HCM Lane LOS	D	C	-	-	A	-
HCM 95th %tile Q(veh)	1.5	4	-	-	0.5	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	209	543	75	46	262	109	105	454	122	159	162	80
Future Volume (vph)	209	543	75	46	262	109	105	454	122	159	162	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		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	0.98		1.00	0.96		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1814		1671	3150		1736	1749		1703	1679	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1814		1671	3150		1736	1749		1703	1679	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	225	584	81	49	282	117	113	488	131	171	174	86
RTOR Reduction (vph)	0	4	0	0	36	0	0	8	0	0	14	0
Lane Group Flow (vph)	225	661	0	49	363	0	113	611	0	171	246	0
Confl. Peds. (#/hr)	9		14	14		9	16		10	10		16
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	19.8	42.1		4.2	26.5		12.5	41.8		12.9	42.2	
Effective Green, g (s)	19.8	42.1		4.2	26.5		12.5	41.8		12.9	42.2	
Actuated g/C Ratio	0.17	0.35		0.04	0.22		0.11	0.35		0.11	0.35	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	294	641		58	701		182	614		184	595	
v/s Ratio Prot	c0.13	c0.36		0.03	0.12		0.07	c0.35		c0.10	0.15	
v/s Ratio Perm												
v/c Ratio	0.77	1.03		0.84	0.52		0.62	1.00		0.93	0.41	
Uniform Delay, d1	47.4	38.5		57.1	40.6		51.0	38.5		52.6	29.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.3	43.8		65.1	0.6		6.4	35.2		45.9	2.1	
Delay (s)	58.6	82.3		122.1	41.3		57.4	73.7		98.5	31.1	
Level of Service	E	F		F	D		E	E		F	C	
Approach Delay (s)		76.3			50.1			71.2			57.9	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	67.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.8

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	1	10	148	1	27	206
Future Vol, veh/h	1	10	148	1	27	206
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	5	5	1	1
Mvmt Flow	1	12	176	1	32	245

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	487	177	0	0	177	0
Stage 1	177	-	-	-	-	-
Stage 2	310	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	543	871	-	-	1405	-
Stage 1	859	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	529	871	-	-	1405	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	859	-	-	-	-	-
Stage 2	729	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	9.4	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	823	1405	-
HCM Lane V/C Ratio	-	-	0.016	0.023	-
HCM Control Delay (s)	-	-	9.4	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	24	0	3	0	1	0	3	165	0	0	249	36
Future Vol, veh/h	24	0	3	0	1	0	3	165	0	0	249	36
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	3	3	3
Mvmt Flow	29	0	4	0	1	0	4	201	0	0	304	44

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	536	536	327	536	558	201	349	0	0	201	0	0
Stage 1	327	327	-	209	209	-	-	-	-	-	-	-
Stage 2	209	209	-	327	349	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	459	454	719	459	441	845	1215	-	-	1365	-	-
Stage 1	690	651	-	798	733	-	-	-	-	-	-	-
Stage 2	798	733	-	690	637	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	456	452	718	455	439	845	1215	-	-	1365	-	-
Mov Cap-2 Maneuver	456	452	-	455	439	-	-	-	-	-	-	-
Stage 1	687	650	-	795	730	-	-	-	-	-	-	-
Stage 2	793	730	-	686	636	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	13.1	13.2	0.1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1215	-	-	439	475	1365	-	-
HCM Lane V/C Ratio	0.003	-	-	0.003	0.069	-	-	-
HCM Control Delay (s)	8	0	-	13.2	13.1	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	6	0	0	4	1	13	0	185	4	34	282	13
Future Vol, veh/h	6	0	0	4	1	13	0	185	4	34	282	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	1	1	1
Mvmt Flow	7	0	0	5	1	15	0	218	5	40	332	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	647	642	339	640	648	221	347	0	0	223	0	0
Stage 1	419	419	-	221	221	-	-	-	-	-	-	-
Stage 2	228	223	-	419	427	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.14	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.236	-	-	2.209	-	-
Pot Cap-1 Maneuver	387	395	708	391	392	824	1201	-	-	1352	-	-
Stage 1	616	593	-	786	724	-	-	-	-	-	-	-
Stage 2	779	723	-	616	589	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	368	380	708	380	377	823	1201	-	-	1352	-	-
Mov Cap-2 Maneuver	368	380	-	380	377	-	-	-	-	-	-	-
Stage 1	616	571	-	785	723	-	-	-	-	-	-	-
Stage 2	763	722	-	593	567	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	15	11	0	0.8
HCM LOS	C	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1201	-	-	621	368	1352	-	-
HCM Lane V/C Ratio	-	-	-	0.034	0.019	0.03	-	-
HCM Control Delay (s)	0	-	-	11	15	7.7	0	-
HCM Lane LOS	A	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	18.7

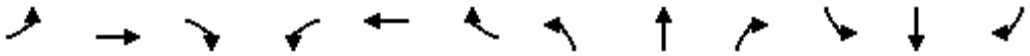
Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	490	37	565	606	26	290
Future Vol, veh/h	490	37	565	606	26	290
Conflicting Peds, #/hr	0	7	7	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	140	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	1	1	3	3
Mvmt Flow	516	39	595	638	27	305

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	562	0	2371	284
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	1829	-
Critical Hdwy	-	-	4.115	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	5.445	-
Follow-up Hdwy	-	-	2.2095	-	3.5285	3.3285
Pot Cap-1 Maneuver	-	-	1013	-	33	711
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	138	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1013	-	~ 14	706
Mov Cap-2 Maneuver	-	-	-	-	~ 14	-
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	57	-

Approach	EB	WB	NE
HCM Control Delay, s	0	6.5	94.9
HCM LOS			F

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	14	706	-	-	1013	-
HCM Lane V/C Ratio	1.955	0.432	-	-	0.587	-
HCM Control Delay (s)	$ 998.9	13.9	-	-	13.5	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	4.1	2.2	-	-	4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	552	120	179	949	238	96	224	113	211	411	146
Future Volume (vph)	110	552	120	179	949	238	96	224	113	211	411	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		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	0.97		1.00	0.97		1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1794		1787	3448		1787	1769		1770	1774	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1794		1787	3448		1787	1769		1770	1774	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	112	563	122	183	968	243	98	229	115	215	419	149
RTOR Reduction (vph)	0	6	0	0	18	0	0	15	0	0	11	0
Lane Group Flow (vph)	112	679	0	183	1193	0	98	329	0	215	557	0
Confl. Peds. (#/hr)	2		12	12		2	10		3	3		10
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.3	43.5		13.0	47.2		7.5	29.2		16.3	38.0	
Effective Green, g (s)	9.3	43.5		13.0	47.2		7.5	29.2		16.3	38.0	
Actuated g/C Ratio	0.08	0.36		0.11	0.39		0.06	0.24		0.14	0.32	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	137	650		193	1356		111	430		240	561	
v/s Ratio Prot	0.06	c0.38		c0.10	c0.35		0.05	0.19		c0.12	c0.31	
v/s Ratio Perm												
v/c Ratio	0.82	1.04		0.95	0.88		0.88	0.76		0.90	0.99	
Uniform Delay, d1	54.5	38.2		53.2	33.8		55.8	42.2		51.0	40.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.0	47.3		49.4	6.8		50.5	12.2		31.7	36.3	
Delay (s)	84.5	85.6		102.6	40.6		106.3	54.4		82.7	77.2	
Level of Service	F	F		F	D		F	D		F	E	
Approach Delay (s)		85.4			48.7			65.9			78.7	
Approach LOS		F			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	66.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.1

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	1	30	189	3	10	116
Future Vol, veh/h	1	30	189	3	10	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	33	205	3	11	126

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	355	207	0	0	209	0
Stage 1	207	-	-	-	-	-
Stage 2	148	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	643	833	-	-	1362	-
Stage 1	828	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	637	833	-	-	1362	-
Mov Cap-2 Maneuver	637	-	-	-	-	-
Stage 1	828	-	-	-	-	-
Stage 2	872	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	9.5	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	825	1362	-
HCM Lane V/C Ratio	-	-	0.041	0.008	-
HCM Control Delay (s)	-	-	9.5	7.7	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	43	0	7	3	4	34	3	222	0	8	122	62
Future Vol, veh/h	43	0	7	3	4	34	3	222	0	8	122	62
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	3	3	3
Mvmt Flow	55	0	9	4	5	44	4	285	0	10	156	79

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	535	511	197	514	550	286	237	0	0	286	0	0
Stage 1	218	218	-	293	293	-	-	-	-	-	-	-
Stage 2	317	293	-	221	257	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	459	469	849	474	446	758	1336	-	-	1270	-	-
Stage 1	789	726	-	719	674	-	-	-	-	-	-	-
Stage 2	698	674	-	786	699	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	424	462	848	464	439	757	1336	-	-	1270	-	-
Mov Cap-2 Maneuver	424	462	-	464	439	-	-	-	-	-	-	-
Stage 1	785	719	-	715	671	-	-	-	-	-	-	-
Stage 2	650	671	-	771	692	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	14.2	10.8	0.1	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1336	-	-	678	456	1270	-	-
HCM Lane V/C Ratio	0.003	-	-	0.078	0.141	0.008	-	-
HCM Control Delay (s)	7.7	0	-	10.8	14.2	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.5	0	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	0	1	14	1	31	0	273	3	11	177	4
Future Vol, veh/h	7	0	1	14	1	31	0	273	3	11	177	4
Conflicting Peds, #/hr	5	0	0	0	0	5	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	3	3	3	1	1	1	5	5	5
Mvmt Flow	9	0	1	18	1	39	0	346	4	14	224	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	628	604	228	602	605	352	230	0	0	349	0	0
Stage 1	255	255	-	347	347	-	-	-	-	-	-	-
Stage 2	373	349	-	255	258	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.53	6.23	4.11	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4.027	3.327	2.209	-	-	2.245	-	-
Pot Cap-1 Maneuver	398	415	816	410	411	689	1344	-	-	1193	-	-
Stage 1	754	700	-	667	633	-	-	-	-	-	-	-
Stage 2	652	637	-	747	692	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	368	409	815	405	405	686	1344	-	-	1187	-	-
Mov Cap-2 Maneuver	368	409	-	405	405	-	-	-	-	-	-	-
Stage 1	753	690	-	667	633	-	-	-	-	-	-	-
Stage 2	611	637	-	735	682	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	14.4	12.2	0	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1344	-	-	559	395	1187	-	-
HCM Lane V/C Ratio	-	-	-	0.104	0.026	0.012	-	-
HCM Control Delay (s)	0	-	-	12.2	14.4	8.1	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0	-	-

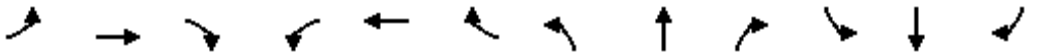
Intersection	
Int Delay, s/veh	7.5

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	497	9	130	274	62	414
Future Vol, veh/h	497	9	130	274	62	414
Conflicting Peds, #/hr	0	3	3	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	140	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	6	6	1	1
Mvmt Flow	529	10	138	291	66	440

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	541	0	1107	272
Stage 1	-	-	-	-	537	-
Stage 2	-	-	-	-	570	-
Critical Hdwy	-	-	4.19	-	6.615	6.915
Critical Hdwy Stg 1	-	-	-	-	5.815	-
Critical Hdwy Stg 2	-	-	-	-	5.415	-
Follow-up Hdwy	-	-	2.257	-	3.5095	3.3095
Pot Cap-1 Maneuver	-	-	1002	-	219	729
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	567	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1002	-	188	727
Mov Cap-2 Maneuver	-	-	-	-	188	-
Stage 1	-	-	-	-	551	-
Stage 2	-	-	-	-	488	-

Approach	EB	WB	NE
HCM Control Delay, s	0	2.9	19.5
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	188	727	-	-	1002	-
HCM Lane V/C Ratio	0.351	0.606	-	-	0.138	-
HCM Control Delay (s)	34.2	17.3	-	-	9.2	-
HCM Lane LOS	D	C	-	-	A	-
HCM 95th %tile Q(veh)	1.5	4.1	-	-	0.5	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	545	75	46	263	109	105	454	122	159	162	80
Future Volume (vph)	211	545	75	46	263	109	105	454	122	159	162	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		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	0.98		1.00	0.96		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1814		1671	3150		1736	1749		1703	1679	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1814		1671	3150		1736	1749		1703	1679	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	227	586	81	49	283	117	113	488	131	171	174	86
RTOR Reduction (vph)	0	4	0	0	36	0	0	8	0	0	14	0
Lane Group Flow (vph)	227	663	0	49	364	0	113	611	0	171	246	0
Confl. Peds. (#/hr)	9		14	14		9	16		10	10		16
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	19.9	42.1		4.2	26.4		12.5	41.8		12.9	42.2	
Effective Green, g (s)	19.9	42.1		4.2	26.4		12.5	41.8		12.9	42.2	
Actuated g/C Ratio	0.17	0.35		0.04	0.22		0.11	0.35		0.11	0.35	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	295	641		58	698		182	614		184	595	
v/s Ratio Prot	c0.13	c0.37		0.03	0.12		0.07	c0.35		c0.10	0.15	
v/s Ratio Perm												
v/c Ratio	0.77	1.03		0.84	0.52		0.62	1.00		0.93	0.41	
Uniform Delay, d1	47.4	38.5		57.1	40.7		51.0	38.5		52.6	29.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.4	44.7		65.1	0.7		6.4	35.2		45.9	2.1	
Delay (s)	58.8	83.2		122.1	41.5		57.4	73.7		98.5	31.1	
Level of Service	E	F		F	D		E	E		F	C	
Approach Delay (s)		77.0			50.3			71.2			57.9	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	67.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.8

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	1	10	148	1	27	206
Future Vol, veh/h	1	10	148	1	27	206
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	5	5	1	1
Mvmt Flow	1	12	176	1	32	245

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	487	177	0	0	177	0
Stage 1	177	-	-	-	-	-
Stage 2	310	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	543	871	-	-	1405	-
Stage 1	859	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	529	871	-	-	1405	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	859	-	-	-	-	-
Stage 2	729	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	9.4	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	823	1405	-
HCM Lane V/C Ratio	-	-	0.016	0.023	-
HCM Control Delay (s)	-	-	9.4	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	0.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	24	1	3	0	1	3	3	165	0	4	249	36
Future Vol, veh/h	24	1	3	0	1	3	3	165	0	4	249	36
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	3	3	3
Mvmt Flow	29	1	4	0	1	4	4	201	0	5	304	44

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	547	545	327	547	567	201	349	0	0	201	0	0
Stage 1	336	336	-	209	209	-	-	-	-	-	-	-
Stage 2	211	209	-	338	358	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	451	449	719	451	436	845	1215	-	-	1365	-	-
Stage 1	682	645	-	798	733	-	-	-	-	-	-	-
Stage 2	796	733	-	681	631	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	445	445	718	445	432	845	1215	-	-	1365	-	-
Mov Cap-2 Maneuver	445	445	-	445	432	-	-	-	-	-	-	-
Stage 1	679	641	-	795	730	-	-	-	-	-	-	-
Stage 2	788	730	-	673	627	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	13.4	10.3	0.1	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1215	-	-	682	464	1365	-	-
HCM Lane V/C Ratio	0.003	-	-	0.007	0.074	0.004	-	-
HCM Control Delay (s)	8	0	-	10.3	13.4	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	0	4	1	14	1	188	4	38	286	13
Future Vol, veh/h	6	0	0	4	1	14	1	188	4	38	286	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	1	1	1
Mvmt Flow	7	0	0	5	1	16	1	221	5	45	336	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	669	663	344	661	668	225	352	0	0	227	0	0
Stage 1	434	434	-	227	227	-	-	-	-	-	-	-
Stage 2	235	229	-	434	441	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.14	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.236	-	-	2.209	-	-
Pot Cap-1 Maneuver	374	384	703	379	382	819	1196	-	-	1347	-	-
Stage 1	604	585	-	780	720	-	-	-	-	-	-	-
Stage 2	773	718	-	604	580	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	354	367	703	366	365	818	1196	-	-	1347	-	-
Mov Cap-2 Maneuver	354	367	-	366	365	-	-	-	-	-	-	-
Stage 1	603	560	-	778	719	-	-	-	-	-	-	-
Stage 2	755	717	-	579	556	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	15.4	11.1	0	0.9
HCM LOS	C	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1196	-	-	617	354	1347	-	-
HCM Lane V/C Ratio	0.001	-	-	0.036	0.02	0.033	-	-
HCM Control Delay (s)	8	0	-	11.1	15.4	7.8	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	20

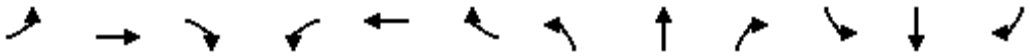
Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	490	37	568	606	26	292
Future Vol, veh/h	490	37	568	606	26	292
Conflicting Peds, #/hr	0	7	7	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	140	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	1	1	3	3
Mvmt Flow	516	39	598	638	27	307

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	562	0	2378	284
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	1836	-
Critical Hdwy	-	-	4.115	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	5.445	-
Follow-up Hdwy	-	-	2.2095	-	3.5285	3.3285
Pot Cap-1 Maneuver	-	-	1013	-	33	711
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	137	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1013	-	~ 13	706
Mov Cap-2 Maneuver	-	-	-	-	~ 13	-
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	56	-

Approach	EB	WB	NE
HCM Control Delay, s	0	6.5	102.8
HCM LOS			F

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	13	706	-	-	1013	-
HCM Lane V/C Ratio	2.105	0.435	-	-	0.59	-
HCM Control Delay (s)	$ 1100	14	-	-	13.5	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	4.2	2.2	-	-	4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	554	120	190	951	238	96	224	113	211	411	148
Future Volume (vph)	112	554	120	190	951	238	96	224	113	211	411	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		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	0.97		1.00	0.97		1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1794		1787	3448		1787	1769		1770	1773	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1794		1787	3448		1787	1769		1770	1773	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	114	565	122	194	970	243	98	229	115	215	419	151
RTOR Reduction (vph)	0	6	0	0	18	0	0	15	0	0	11	0
Lane Group Flow (vph)	114	681	0	194	1195	0	98	329	0	215	559	0
Confl. Peds. (#/hr)	2		12	12		2	10		3	3		10
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.6	43.5		12.5	46.4		6.5	29.7		16.3	39.5	
Effective Green, g (s)	9.6	43.5		12.5	46.4		6.5	29.7		16.3	39.5	
Actuated g/C Ratio	0.08	0.36		0.10	0.39		0.05	0.25		0.14	0.33	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	141	650		186	1333		96	437		240	583	
v/s Ratio Prot	0.06	c0.38		c0.11	c0.35		0.05	0.19		c0.12	c0.32	
v/s Ratio Perm												
v/c Ratio	0.81	1.05		1.04	0.90		1.02	0.75		0.90	0.96	
Uniform Delay, d1	54.3	38.2		53.8	34.5		56.8	41.8		51.0	39.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.7	48.2		77.8	8.2		97.6	11.4		31.7	28.5	
Delay (s)	82.0	86.5		131.5	42.7		154.4	53.1		82.7	67.9	
Level of Service	F	F		F	D		F	D		F	E	
Approach Delay (s)		85.9			55.0			75.6			72.0	
Approach LOS		F			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	68.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	98.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF OREGON CITY, CLACKAMAS COUNTY

CENTRAL POINT RD at SKELLENGER WY, City of Oregon City, Clackamas County, 01/01/2011 to 12/31/2015

No Rows to Display

SER# / INVEST	S P E D	A L C	U G S	C H L	O R K	DATE / DAY / TIME	CLASS / DIST / FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE

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TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
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CITY OF OREGON CITY, CLACKAMAS COUNTY

CENTRAL POINT RD at SKELLENGER WY, City of Oregon City, Clackamas County, 01/01/2011 to 12/31/2015

No Rows to Display

SER# / INVEST	S P E D	A L C	U G S	C H L	O R K	DATE / DAY / TIME	CLASS / DIST / FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE

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CITY OF OREGON CITY, CLACKAMAS COUNTY

CENTRAL POINT RD at WARNER-PARROTT RD, City of Oregon City, Clackamas County, 01/01/2011 to 12/31/2015

Total crash records: 7

SER# / INVEST	S P E D	A L C	R U G S	S C H L	W O R K	DATE / DAY / TIME	CLASS / DIST / FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01895	N	N	N	N	N	05/17/2014	16	CENTRAL POINT RD	INTER	3-LEG	N	Y	CLR	FIX OBJ	01	NONE 0	STRGHT										040	03,32
CITY						SA	0	WARNER-PARROTT RD	NE		STOP SIGN	N	DRY	FIX		PRVTE	SW-NE									000	040	00
						3A			05	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	21	F	OR-Y OR<25		021,052,081	000		03,32
02233	N	N	N			06/11/2014	16	CENTRAL POINT RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NO RPT						WE	0	WARNER-PARROTT RD	SE		L-GRN-SIG	N	DRY	REAR		PRVTE	SE-NW									000		00
						4P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	53	M	OR-Y OR<25		026	000		29
															02	NONE 0	STOP											
																PRVTE	SE-NW									012		00
																PSNGR CAR		01	DRVR	INJC	45	F	OR-Y OR<25		000	000		00
03639	N	N	N	N	N	10/01/2012	16	CENTRAL POINT RD	INTER	3-LEG	N	N	CLR	BIKE													110	02
CITY						MO	0	WARNER-PARROTT RD	SW		UNKNOWN	N	DRY	TURN			-											
						3P			05	0		N	DAY	INJ			STRGHT NW SE	01	BIKE	INJB	47	M		I XWK?	000	034		00
															01	NONE 0	TURN-L											
																PRVTE	SE-SW									000	110	00
																PSNGR CAR		01	DRVR	NONE	28	M	OR-Y OR<25		027,008	000		02
05468	N	N	N			12/18/2015	16	CENTRAL POINT RD	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											29
NONE						FR	0	WARNER-PARROTT RD	SW		STOP SIGN	N	WET	REAR		PRVTE	SW-NE									000		00
						4P			06	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	30	M	OR-Y OR<25		026	000		29
															02	NONE 0	STOP											
																PRVTE	SW-NE									011		00
																PSNGR CAR		01	DRVR	NONE	00	F	UNK OR<25		000	000		00
00149	N	N	N			01/12/2015	16	CENTRAL POINT RD	INTER	3-LEG	N	N	CLR	O-1STOP	01	NONE 0	BACK											10
NO RPT						MO	0	WARNER-PARROTT RD	NW		UNKNOWN	N	DRY	BACK		PRVTE	SE-NW									000		00
						11A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y OR<25		011	000		10
															02	NONE 0	STOP											
																PRVTE	NW-SE									011		00
																PSNGR CAR		01	DRVR	NONE	38	M	OR-Y OR<25		000	000		00
03616	N	N	N			09/25/2013	16	CENTRAL POINT RD	INTER	3-LEG	N	N	CLD	ANGL-OTH	01	NONE 0	TURN-L											02
NONE						WE	0	WARNER-PARROTT RD	CN		STOP SIGN	N	DRY	TURN		PRVTE	SW-NW									015		00
						4P			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y UNK		028	000		02
															02	NONE 0	STRGHT											
																PRVTE	NW-SE									000		00
																PSNGR CAR		01	DRVR	NONE	58	F	OR-Y OR<25		000	000		00
00842	N	N	N			03/07/2015	16	CENTRAL POINT RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L											02
NO RPT						SA	0	WARNER-PARROTT RD	CN		STOP SIGN	N	DRY	TURN		PRVTE	SW-NW									015		00
						11A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	41	M	OR-Y OR<25		028	000		02
															02	NONE 0	STRGHT											
																PRVTE	NW-SE									000		00

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CITY OF OREGON CITY, CLACKAMAS COUNTY

CENTRAL POINT RD at WARNER-PARROTT RD, City of Oregon City, Clackamas County, 01/01/2011 to 12/31/2015

Total crash records: 7

SER# / INVEST	S P E D	A L C	R U G S	S C H L	W O R K	DATE / DAY / TIME	CLASS / DIST / FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																PSNGR CAR		01	DRVR	INJC	21	M	OR-Y OR<25		000	000		00

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CRASH SUMMARIES BY YEAR BY COLLISION TYPE

CENTRAL POINT RD at WARNER-PARROTT RD, City of Oregon City, Clackamas County, 01/01/2011 to 12/31/2015

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2015														
BACKING	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	0	1	1	0	0	0	0	1	0	1	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR 2015 TOTAL	**0**	**1**	**2**	**3**	**0**	**1**	**0**	**2**	**1**	**2**	**1**	**3**	**0**	**0**
YEAR: 2014														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	1	0	0	1	1	0	1
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR 2014 TOTAL	**0**	**1**	**1**	**2**	**0**	**1**	**0**	**2**	**0**	**1**	**1**	**2**	**0**	**1**
YEAR: 2013														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR 2013 TOTAL	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**0**
YEAR: 2012														
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR 2012 TOTAL	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**0**
FINAL TOTAL	**0**	**3**	**4**	**7**	**0**	**3**	**0**	**6**	**1**	**5**	**2**	**7**	**0**	**1**

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CITY OF OREGON CITY, CLACKAMAS COUNTY

LELAND RD at WARNER-PARROTT RD, City of Oregon City, Clackamas County, 01/01/2011 to 12/31/2015

Total crash records: 2

SER# / INVEST	S P E D	A L C	R U G S	S C H L	W O R K	DATE / DAY / TIME	CLASS / DIST / FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
00720	N	N	N			03/02/2013	16	LELAND RD	INTER	CROSS	N	N	RAIN	PED	01	NONE 0	TURN-R											02
CITY						SA	0	WARNER-PARROTT RD	SW		TRF SIGNAL	N	WET	PED		PRVTE	W -S									000		00
						8P			06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	42	M	OR-Y OR<25		029	000		02
																	- STRGHT W E	01	PED	INJB	14	M		I XWLK	000	035		00
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																PSNGR CAR		01	DRVR	NONE	16	F	OR-Y OR<25		020	000		04

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

LELAND RD at WARNER-PARROTT RD, City of Oregon City, Clackamas County, 01/01/2011 to 12/31/2015

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2013														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
PEDESTRIAN	0	1	0	1	0	1	0	0	1	0	1	1	0	0
YEAR 2013 TOTAL	**0**	**1**	**1**	**2**	**0**	**1**	**0**	**1**	**1**	**1**	**1**	**2**	**0**	**0**
FINAL TOTAL	**0**	**1**	**1**	**2**	**0**	**1**	**0**	**1**	**1**	**1**	**1**	**2**	**0**	**0**

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

Exhibit I: Geotechnical Engineering Report

GeoPacific Engineering, Inc.

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

June 16, 2017
Project No. 17-4521

Rian Park Development, Inc.
Attn: Bruce Ament
PO Box 2559
Oregon City, OR 97045

CC: Vu Nguyen, AKS Engineering & Forestry via email: VuN@aks-eng.com

SUBJECT: GEOTECHNICAL ENGINEERING REPORT
WHEELER FARMS SUBDIVISION
TAX LOTS 31E12D (01700/1790); 32E07C (1291/1180/1100/1001)
OREGON CITY, OREGON

This report presents the results of a geotechnical exploration conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above-referenced project. The purpose of our work was to evaluate subsurface conditions at the site and provide recommendations for site development. This geotechnical exploration was performed in accordance with GeoPacific Proposal No. P-6025 dated March 16, 2017 and your subsequent authorization of our proposals and *General Conditions for Geotechnical Services*.

SITE AND PROJECT DESCRIPTION

The subject site is located at the eastern terminus of South White Lane in Oregon City, Clackamas County, Oregon. The property consists of six parcels that total approximately 22.5 acres. Topography is flat to gently sloping to the southeast with grades of 5 to 20 percent. Grades steepen to approximately 50 percent grade to the east. A large, prehistoric or ancient (greater than 150 years old) landslide is located along the eastern property line and beyond. One home and auxiliary structure currently occupies the site. Vegetation consists primarily of short grasses and dense to sparse trees. Two parcels are occupied by orchard and Christmas trees are present elsewhere. A 125 foot electric transmission line easement bisects the central portion of the property.

It is our understanding that the proposed development will consist of a 77 lot subdivision for single family homes, new streets, water quality facility, open space, and associated underground utilities. The grading plan provided for our review indicates maximum cuts will be on the order of 13 feet and fills will be on the order of about 10 feet.

REGIONAL GEOLOGIC SETTING

Regionally, the subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

The subject site lies on a broad volcanic plateau underlain by the Boring Lava Formation which formed during a period of Plio-Pleistocene (5 to 0.2 million years ago) volcanism and faulting (Schlicker and Finlayson, 1979). The Boring Lava consists mainly of basaltic lava flows, but locally contains tuff breccia, ash, tuff, cinders, and scoriaceous volcanic debris flows deposited on the flanks of volcanic cones. The flows are commonly light gray to nearly black, with lighter tones predominating, and are characterized by columnar jointing and flow structures. The upper surface of the Boring Lava is typically weathered to depths of 25 feet or more with the upper 5 to 15 feet consisting of red-brown, clayey silt to silty clay soil.

Underlying the Boring Lava is the late Miocene to late Pliocene age (6 to 1.6 million years old) Troutdale Formation (Madin, 2009; Schlicker and Finlayson, 1979). In the site vicinity, the Troutdale Formation consists primarily of massive mudstone, claystone, and siltstone with minor sandstone and water-laid tuff. Ripples, channels and cross bedding structures are common, indicating a fluvial origin of deposition. Locally, the Troutdale Formation may contains organic material including wood and logs.

REGIONAL SEISMIC SETTING

At least three major source zones capable of generating damaging earthquakes are thought to exist in the vicinity of the subject site.

Portland Hills Fault Zone

The Portland Hills Fault Zone is a series of NW-trending faults that include the central Portland Hills Fault, the western Oatfield Fault, and the eastern East Bank Fault. These faults occur in a northwest-trending zone that varies in width between 3.5 and 5.0 miles. The combined three faults vertically displace the Columbia River Basalt by 1,130 feet and appear to control thickness changes in late Pleistocene (approx. 780,000 years) sediment (Madin, 1990). The Portland Hills Fault occurs along the Willamette River at the base of the Portland Hills, and is about 5 miles northeast of the site. The Oatfield Fault occurs along the western side of the Portland Hills, and is about 4.5 miles northeast of the site. The accuracy of the fault mapping is stated to be within 500 meters (Wong, et al., 2000). No historical seismicity is correlated with the mapped portion of the Portland Hills Fault Zone, but in 1991 a M3.5 earthquake occurred on a NW-trending shear plane located 1.3 miles east of the fault (Yelin, 1992). Although there is no definitive evidence of recent activity, the Portland Hills Fault Zone is assumed to be potentially active (Geomatrix Consultants, 1995).

Gales Creek-Newberg-Mt. Angel Structural Zone

The Gales Creek-Newberg-Mt. Angel Structural Zone is a 50-mile-long zone of discontinuous, NW-trending faults that lies about 16 miles southwest of the subject site. These faults are recognized in the subsurface by vertical separation of the Columbia River Basalt and offset seismic reflectors in the overlying basin sediment (Yeats et al., 1996; Werner et al., 1992). A recent geologic reconnaissance and photogeologic analysis study conducted for the Scoggins Dam site in the

Tualatin Basin revealed no evidence of deformed geomorphic surfaces along the structural zone (Unruh et al., 1994). No seismicity has been recorded on the Gales Creek or Newberg Faults (the faults closest to the subject site); however, these faults are considered to be potentially active because they may connect with the seismically active Mount Angel Fault and the rupture plane of the 1993 M5.6 Scotts Mills earthquake (Werner et al. 1992; Geomatrix Consultants, 1995).

Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year (Goldfinger et al., 1996). A growing body of geologic evidence suggests that prehistoric subduction zone earthquakes have occurred (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). This evidence includes: (1) buried tidal marshes recording episodic, sudden subsidence along the coast of northern California, Oregon, and Washington, (2) burial of subsided tidal marshes by tsunami wave deposits, (3) paleoliquefaction features, and (4) geodetic uplift patterns on the Oregon coast. Radiocarbon dates on buried tidal marshes indicate a recurrence interval for major subduction zone earthquakes of 250 to 650 years with the last event occurring 300 years ago (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). The inferred seismogenic portion of the plate interface lies roughly along the Oregon Coast at depths of 20 and 40 kilometers below the ocean surface.

FIELD EXPLORATION

Our site-specific exploration for this report was conducted on April 20, May 9, and May 10, 2017. Ten exploratory test pits were excavated with a medium sized trackhoe to depths ranging between 10 and 12 feet at the approximate locations shown on Figure 2. Two exploratory borings (designated B-1 and B-2) were drilled with a track mounted drill rig to depths of 35 to 101.5 feet at the approximate locations indicated on Figure 2. It should be noted that exploration locations were located in the field by pacing or taping distances from apparent property corners and other site features shown on the plans provided. As such, the locations of the explorations should be considered approximate.

The boreholes were drilled using a track mounted drill rig and mud rotary methods operated by Western States Soil Conservation, Inc. of Hubbard, Oregon. At each boring location, SPT (Standard Penetration Test) sampling was performed in general accordance with ASTM D1586 using a 2-inch outside diameter split-spoon sampler and a 140-pound hammer equipped with a rope and cathead mechanism. During the test, a sample is obtained by driving the sampler 18 inches into the soil with the hammer free-falling 30 inches. The number of blows for each 6 inches of penetration is recorded. The Standard Penetration Resistance ("N-value") of the soil is calculated as the number of blows required for the final 12 inches of penetration. If 50 or more blows are recorded within a single 6-inch interval, the test is terminated, and the blow count is recorded as 50 blows for the number of inches driven. This resistance, or N-value, provides a measure of the relative density of granular soils and the relative consistency of cohesive soils. At the completion of the borings, the holes were backfilled with bentonite.

A GeoPacific geologist continuously monitored the field exploration program and logged the explorations. Soils observed in the explorations were classified in general accordance with the Unified Soil Classification System. Rock hardness was classified in accordance with Table 1, modified from the ODOT Rock Hardness Classification Chart. During exploration, our geologist also noted geotechnical conditions such as soil consistency, moisture and groundwater conditions.

Logs of the test pits and borings are attached to this report. The following report sections are based on the exploration program and summarize subsurface conditions encountered at the site.

Table 1. Rock Hardness Classification Chart

ODOT Rock Hardness Rating	Field Criteria	Unconfined Compressive Strength	Typical Equipment Needed For Excavation
Extremely Soft (R0)	Indented by thumbnail	<100 psi	Small excavator
Very Soft (R1)	Scratched by thumbnail, crumbled by rock hammer	100-1,000 psi	Small excavator
Soft (R2)	Not scratched by thumbnail, indented by rock hammer	1,000-4,000 psi	Medium excavator (slow digging with small excavator)
Medium Hard (R3)	Scratched or fractured by rock hammer	4,000-8,000 psi	Medium to large excavator (slow to very slow digging), typically requires chipping with hydraulic hammer or mass excavation)
Hard (R4)	Scratched or fractured w/ difficulty	8,000-16,000 psi	Slow chipping with hydraulic hammer and/or blasting
Very Hard (R5)	Not scratched or fractured after many blows, hammer rebounds	>16,000 psi	Blasting

SUBSURFACE CONDITIONS

Results of the field exploration program indicate the site is underlain by a topsoil horizon, residual soil and weathered rock belonging to the Boring Lava Formation, and residual soil and weathered rock belonging to the Troutdale Formation. The observed soil and groundwater conditions are summarized below.

Topsoil – The ground surface in test pits TP-1 through TP-10 and borings B-1 and B-2 was directly underlain by a moderately organic topsoil horizon. The topsoil horizon was composed of light brown clayey silt (OL-ML) that contained fine roots throughout. The topsoil generally extended to a depth of 8 to 12 inches and had a medium stiff consistency.

Residual Soil of Boring Lava Formation – Underlying the topsoil horizon in test pits TP-1 through TP-10 and borings B-1 and B-2 was clayey silt (ML) to silty clay (CL) residual soil resulting from in-place weathering of the underlying Boring Lava Formation. The light reddish brown silty clay to clayey silt contained weathered basalt fragments and was generally characterized by a stiff to very stiff consistency. In explorations, the residual soil extended to a depth of 2.5 to 8 feet.

Boring Lava Formation – Highly weathered basalt belonging to the Boring Lava Formation was encountered beneath the residual soil in test pits TP-1 through TP-10 and borings B-1 and B-2. The basalt was weathered to extremely soft (R0) to very soft (R1) and contained trace silty clay to clayey silt matrix. In test pits TP-1 through TP10, the extremely soft (R0) to very soft (R1) basalt extended beyond the maximum depth of exploration (10 to 12 feet). The extremely soft (R0) to

very soft (R1) basalt transitioned to soft (R2) to medium hard (R3) basalt in borings B-1 and B-2 at depths of 9 and 18 feet, respectively. The soft (R2) to medium hard (R3) basalt extended beyond the maximum depth of exploration in boring B-2 (35 feet). The medium-size trackhoe used for our explorations was able to excavate the R0 and R1 basalt with relative ease and practical refusal was not met in any test pit explorations to a maximum depth of 12 feet.

Residual Soil of Troutdale Formation – Underlying the basalt belonging to the Boring Lava Formation in boring B-1 was clayey silt (ML) with trace sand residual soil resulting from in-place weathering of the underlying Troutdale Formation. The light brown clayey silt exhibited dark red mottling and was generally characterized by a very stiff consistency. In boring B-1, the residual soil of the Troutdale Formation extended to a depth of 31 feet.

Troutdale Formation – The residual soil of the Troutdale Formation in boring B-1 was underlain by mudstone belonging to the Troutdale Formation. The mudstone was weathered and classified as extremely soft (R0) to very soft (R1) according to the ODOT Rock Hardness Chart (Table 1). The mudstone was brown to brownish gray in color and trace laminar bedding could be observed. The mudstone extended to a depth of approximately 57 feet and standard penetration testing indicate a hard consistency with N values on the order of N=41 to N=50 for 5.5 inches. The weathered mudstone was underlain by extremely soft (R0) sandstone that contained trace silt. Standard penetration testing indicates the sandstone is very dense with N-values ranging from N=64 to N=50 for 5.75 inches. The highly weathered sandstone extended beyond the maximum depth of exploration in boring B-1 (101.5 feet).

Groundwater

On April 20 and May 9-10, 2017, soils encountered in explorations were damp to moist. Static groundwater was not encountered in test pits to a depth of 12 feet. Groundwater could not be determined in the borings due to mud rotary techniques. Perched groundwater seepage was encountered in test pit TP-9 at a depth of 6 feet. Discharge was visually estimated at less than ¼ gallon per minute. Regional groundwater mapping by Snyder (2008) indicates groundwater levels are approximately 40 to 60 feet below the existing ground surface. Experience has shown that temporary perched storm-related groundwater conditions often occur within the surface soils over fine-grained native deposits such as those beneath the site, particularly during the wet season. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors.

The 1979 Geology and Geologic Hazards Study by Schlicker and Finlayson identifies the area has having wet soils and/or a high water table; this is the study that primarily helped modify Oregon City's development code to require that groundwater concerns be addressed. This regionally mapped wet soils condition is predominantly created by storm runoff during the wet season due to the impermeable clay soils derived from the Boring Lava Formation and slow draining topography of the Oregon City plain. Such shallow, perched groundwater is a lesser geotechnical issue than seeps or springs created from groundwater emanating from below due to geologic structural control of groundwater flow. The effects of shallow perched groundwater are most pronounced in low-lying areas which are currently mapped as wetlands and stay wet for longer periods, perhaps year round. At the time of the 1979 report, areas of severe concern such as low-lying wetlands and drainages could still be developed. This report served as a warning for those attempting to develop in low-lying areas that localized development sites may have more severe problems than the average site in the region and that specific types of constructed systems may experience water related difficulties. The report specifically addresses concerns relating to hydrostatic pressures on basement walls, underground storage tanks, and poor performance of septic systems. We do not

believe that any of these constructed systems are currently proposed at the Wheeler Farms Subdivision.

INFILTRATION TESTING

Soil infiltration testing was performed using the open hole infiltration method in test pits TP-1 through TP-10 at depths of 5 and 12 feet, as indicated on Table 2. The soil was pre-saturated for a period of over 3 hours. The water level was measured to the nearest tenth of an inch every half hour with reference to the ground surface. Table 2 presents the results of our falling head infiltration testing and do not incorporate a factor of safety.

Table 2. Summary of Infiltration Test Results

Test Pit	Depth (feet)	Soil Type	Infiltration Rate (in/hr)	Hydraulic Head Range (inches)
TP-1	5	Highly Weathered Basalt	***0.9***	7-11
TP-2	5	Highly Weathered Basalt	***1.3***	8-14
TP-3	12	Highly Weathered Basalt	***2.8***	6-20
TP-4	12	Highly Weathered Basalt	0.2	23-24
TP-5	12	Highly Weathered Basalt	0.06	23-24
TP-6	5	Silty Clay (CL) to Clayey Silt (ML) (Residual Soil)	***4.0***	2-13
TP-7	5	Silty Clay (CL) to Clayey Silt (ML) with Basalt (Residual Soil)	***3.5***	11-19
TP-8	5	Highly Weathered Basalt	0.1	25-26
TP-9	5	Highly Weathered Basalt	***1.4***	14-20
TP-10	5	Highly Weathered Basalt	0.3	24-26

***Note*:** Test results considered too high for materials observed.

Slope Stability

For the purpose of evaluating slope stability, we: (1) reviewed of published geologic mapping, (2) performed a field reconnaissance of the property, and (3) performed a program of subsurface exploration including test pits and borings.

Landslide inventory mapping of the Oregon City Quadrangle and the statewide landslide database indicates the headscarp of a prehistoric or ancient landslide (greater than 150 years old) is present along the southeastern property line, as indicated on Figure 1B (Burns and Madin, 2009, Dogami SLIDO, 2017). The landslide is classified as a rock slide-rotational with an earthflow component. The Dogami SLIDO database indicates the landslide is deep seated with a failure depth of approximately 70 to 75 feet. Our reconnaissance and review of Lidar based high resolution digital

elevation maps (Dogami, 2017) indicate slope geomorphology adjacent to the ancient landslide is smooth and uniform. No evidence of recent movement (ground cracks, scarps, or hummocky topography) was observed during our reconnaissance.

The Troutdale Formation, which underlies the site vicinity at depth, includes a thick sequence of weak sedimentary strata that are prone to instability on moderate to steep slopes. Regionally, many large landslides are mapped within the Troutdale Formation primarily on the side slopes of drainages where stream erosion has deeply incised the formation and created oversteepened slopes (Schlicker and Finlayson, 1979; Madin, 1994; Madin and Burns, 2006). In areas where the Troutdale Formation is capped by Boring Lava, these landslides are known to propagate upslope by undermining large blocks of Boring Lava Formation.

Subsurface exploration indicates that the ground surface is underlain by residual soil and weathered rock belonging to the Boring Lava Formation underlain by residual soil and weathered mudstone and sandstone belonging to the Troutdale Formation. Pocket penetrometer measurements of the residual soil of the Boring Lava Formation indicate an approximate unconfined compressive strength of 1.0 to 4.5 tons/ft^2 which correlates to a stiff to very stiff consistency. The residual soil extended to a depth of 2.5 to 8 feet and was underlain by weathered Boring Lava basalt. Standard penetration tests in borings B-1 and B-2 indicate that the basalt has a generally stiff to hard consistency with N-values ranging between N=4 and N=50 for less than 1 inch. In boring B-1, the basalt was underlain by residual soil of the Troutdale Formation that had a very stiff consistency with N-values ranging between N=14 and N=18. The residual soil extended to a depth of 31 feet and was underlain by weathered mudstone belonging to the Troutdale Formation. The mudstone had a hard consistency with N-values of N=41 to N=50 for 4.5 inches. In boring B-1, the mudstone was underlain by weathered sandstone that was very dense with N-values of N=56 to N=50 for 5 inches. No weak zones such as volcanic ash layers were observed in explorations and contacts between the layers appeared to be gradational. Our explorations indicate that native soils underlying the slope are characterized by moderate shear strength and a moderate to high resistance to slope instability.

In our opinion, prior slope instability southeast of and along the southeastern property line of the site likely resulted from failure of steeply sloping exposures of the Troutdale Formation and undermining of the Boring Lava. Since the failure occurred greater than 150 years ago, slopes adjacent to the landslide are less steep and existing landslide debris support the toe of the slope. Existing Boring Lava and Troutdale Formation materials are very stiff to hard and no evidence of recent landslide movement was observed. In order to prevent damage caused by reactivation of the headscarp of the existing slide, a 50 foot horizontal building to top of steep slope setback is recommended for lots adjacent to the headscarp (Lots 51 through 53, Lot 63, and Lot 64.

CONCLUSIONS AND RECOMMENDATIONS

Our investigation indicates that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. In our opinion, the greatest geotechnical constraint for this project is the potential for encountering hard rock boulders and the steep slope in the southeastern portion of the site. Due to the presence of the headscarp and prehistoric/ancient landslide along the southeast property line and to the southeast of the property, a 50 foot horizontal building to top of steep slope setback is recommended for structures on Lots 51 through 53, Lot 63, and Lot 64.

The Boring Lava Formation, which underlies the site, is known for hard, rounded basalt boulders which could hamper excavations (such as for utility trenching). The rock encountered in test pits

was highly weathered and excavatable to depths of 10 to 12 feet and practical refusal was not achieved. Large, hard boulders should be expected throughout the site that could make deep excavations difficult. Contractors should be prepared to manage difficult excavation conditions and budget accordingly.

Stormwater Disposal

The results of our infiltration testing indicate that soils have a limited infiltration capacity at depths of 5 and 12 feet below the ground surface in clayey silt to silty clay residual soils and weathered basalt, as shown on Table 2. Testing conducted in test pits TP-1 through TP-3, TP-6, TP-7, and TP-9 yielded higher infiltration rates than testing conducted elsewhere at the site under similar geologic conditions. These higher rates may be due to fractures in the weathered basalt or rooted zones within the residual soil that would likely silt up over time or become saturated quickly in a storm event.

Infiltration test methods and procedures attempt to simulate the as-built conditions of the planned subsurface disposal system. However, due to natural variations in soil properties, actual infiltration rates may vary from the measured and/or recommended design rates. All systems should be constructed such that potential overflow is discharged in a controlled manner away from structures, and all systems should include an adequate factor of safety. Infiltration rates presented in this report should not be applied to inappropriate or complex hydrological models such as a closed basin without extensive further studies. This report presents infiltration test results only, and should not be construed as an approval of a system design.

Site Preparation

Areas of proposed buildings, new streets, and areas to receive fill should be cleared of vegetation and any organic and inorganic debris. Existing buried structures, should be demolished and any cavities structurally backfilled. Inorganic debris and organic materials from clearing should be removed from the site.

Existing fill and any organic-rich topsoil should then be stripped from construction areas of the site or where engineered fill is to be placed. Fill was not encountered in our explorations; however, areas of fill may be present elsewhere at the site, especially in the vicinity of the exiting structures. The estimated depth range necessary for removal of topsoil in cut and fill areas is approximately 6 to 9 inches, respectively. Deeper stripping may be necessary to remove large tree roots in orchard and Christmas tree areas. The final depth of soil removal will be determined on the basis of a site inspection after the stripping/ excavation has been performed. Stripped topsoil should preferably be removed from the site. Any remaining topsoil should be stockpiled only in designated areas and stripping operations should be observed and documented by the geotechnical engineer or his representative. Any remaining undocumented fills and subsurface structures (tile drains, basements, driveway and landscaping fill, old utility lines, septic leach fields, etc.) should be removed and the excavations backfilled with engineered fill.

Once stripping of a particular area is approved, the area must be ripped or tilled to a depth of 12 inches, moisture conditioned, root-picked, and compacted in-place prior to the placement of engineered fill or crushed aggregate base for pavement. Exposed subgrade soils should be evaluated by the geotechnical engineer. For large areas, this evaluation is normally performed by proof-rolling the exposed subgrade with a fully loaded scraper or dump truck. For smaller areas where access is restricted, the subgrade should be evaluated by probing the soil with a steel probe. Soft/loose soils identified during subgrade preparation should be compacted to a firm and unyielding condition, over-excavated and replaced with engineered fill (as described below), or

stabilized with rock prior to placement of engineered fill. The depth of overexcavation, if required, should be evaluated by the geotechnical engineer at the time of construction.

Excavating Conditions and Utility Trenches

We anticipate that on-site soils can be excavated using conventional heavy equipment such as scrapers and trackhoes. Highly weathered basalt bedrock was encountered in explorations throughout the site at depths of 2.5 to 8 feet. Practical refusal on soft (R2) to medium hard (R3) basalt boulders was not achieved in explorations. Our test pit explorations indicate the basalt bedrock is moderately weathered and excavation depths of 12 feet should be obtainable with conventional heavy equipment. Deeper excavations may encounter harder rock and based on our experience with soils in this area, large, hard boulders can be commonly encountered during construction activities. The selected contractor for site development should be prepared for encountering boulders.

All temporary cuts in excess of 4 feet in height should be sloped in accordance with U.S. Occupational Safety and Health Administration (OSHA) regulations (29 CFR Part 1926), or be shored. The existing native soils classify as Type B Soil and temporary excavation side slope inclinations as steep as 1H:1V may be assumed for planning purposes. This cut slope inclination is applicable to excavations above the water table only. Maintenance of safe working conditions, including temporary excavation stability, is the responsibility of the contractor. Actual slope inclinations at the time of construction should be determined based on safety requirements and actual soil and groundwater conditions.

Saturated soils and groundwater may be encountered in utility trenches, particularly during the wet season. We anticipate that dewatering systems consisting of ditches, sumps and pumps would be adequate for control of perched groundwater. Regardless of the dewatering system used, it should be installed and operated such that in-place soils are prevented from being removed along with the groundwater.

Vibrations created by traffic and construction equipment may cause some caving and raveling of excavation walls. In such an event, lateral support for the excavation walls should be provided by the contractor to prevent loss of ground support and possible distress to existing or previously constructed structural improvements.

PVC pipe should be installed in accordance with the procedures specified in ASTM D2321. We recommend that trench backfill be compacted to at least 95% of the maximum dry density obtained by Modified Proctor ASTM D1557 or equivalent. Initial backfill lift thickness for a ¾"-0 crushed aggregate base may need to be as great as 4 feet to reduce the risk of flattening underlying flexible pipe. Subsequent lift thickness should not exceed 1 foot. If imported granular fill material is used, then the lifts for large vibrating plate-compaction equipment (e.g. hoe compactor attachments) may be up to 2 feet, provided that proper compaction is being achieved and each lift is tested. Use of large vibrating compaction equipment should be carefully monitored near existing structures and improvements due to the potential for vibration-induced damage.

Adequate density testing should be performed during construction to verify that the recommended relative compaction is achieved. Typically, one density test is taken for every 4 vertical feet of backfill on each 200-lineal-foot section of trench.

Engineered Fill

All grading for the proposed development should be performed as engineered grading in accordance with the applicable building code at time of construction with the exceptions and additions noted herein. Proper test frequency and earthwork documentation usually requires daily observation and testing during stripping, rough grading, and placement of engineered fill. Imported fill material must be approved by the geotechnical engineer prior to being imported to the site. Oversize material greater than 6 inches in size should not be used within 3 feet of foundation footings, and material greater than 12 inches in diameter should not be used in engineered fill.

Engineered fill should be compacted in horizontal lifts not exceeding 8 inches using standard compaction equipment. We recommend that engineered fill be compacted to at least 95% of the maximum dry density determined by ASTM D698 (Standard Proctor) or equivalent. Field density testing should conform to ASTM D2922 and D3017, or D1556. All engineered fill should be observed and tested by the project geotechnical engineer or his representative. Rocky fill may need to be evaluated by proofrolling and should be placed wet of optimum moisture content. Typically, one density test is performed for at least every 2 vertical feet of fill placed or every 500 yd^3, whichever requires more testing. Because testing is performed on an on-call basis, we recommend that the earthwork contractor be held contractually responsible for test scheduling and frequency. Site earthwork will be impacted by soil moisture and shallow groundwater conditions. Earthwork in wet weather would likely require extensive use of cement or lime treatment, or other special measures, at considerable additional cost compared to earthwork performed under dry-weather conditions.

Wet Weather Earthwork

Soils underlying the site are likely to be moisture sensitive and may be difficult to handle or traverse with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. Earthwork performed during the wet-weather season will probably require expensive measures such as cement treatment or imported granular material to compact fill to the recommended engineering specifications. If earthwork is to be performed or fill is to be placed in wet weather or under wet conditions when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean engineered fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance. Under some circumstances, it may be necessary to excavate soils with a backhoe to minimize subgrade disturbance caused by equipment traffic;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Material used as engineered fill should consist of clean, granular soil containing less than 5 percent fines. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;

- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction and site drainage is achieved; and
- Geotextile silt fences, straw wattles, and fiber rolls should be strategically located to control erosion.

If cement or lime treatment is used to facilitate wet weather construction, GeoPacific should be contacted to provide additional recommendations and field monitoring.

Erosion Control Considerations

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion except in areas of moderately to steeply sloping topography. In our opinion, the primary concern regarding erosion potential will occur during construction, in areas that have been stripped of vegetation. Erosion at the site during construction can be minimized by implementing the project erosion control plan, which should include judicious use of straw bales and silt fences. If used, these erosion control devices should be in place and remain in place throughout site preparation and construction.

Erosion and sedimentation of exposed soils can also be minimized by quickly re-vegetating exposed areas of soil, and by staging construction such that large areas of the project site are not denuded and exposed at the same time. Areas of exposed soil requiring immediate and/or temporary protection against exposure should be covered with either mulch or erosion control netting/blankets. Areas of exposed soil requiring permanent stabilization should be seeded with an approved grass seed mixture, or hydroseeded with an approved seed-mulch-fertilizer mixture.

Pavement Design

For design purposes, we used an estimated resilient modulus of 9,000 for compacted native soil. Table 3 presents our recommended minimum pavement section for dry weather construction.

Table 3. Recommended Minimum Dry-Weather Pavement Section

Material Layer	Light-duty Public Streets	Compaction Standard
Asphaltic Concrete (AC)	3 in.	92% of Rice Density AASHTO T-209
Crushed Aggregate Base ¾"-0 (leveling course)	2 in.	95% of Modified Proctor AASHTO T-180
Crushed Aggregate Base 1½"-0	8 in.	95% of Modified Proctor AASHTO T-180
Subgrade	12 in.	95% of Standard Proctor AASHTO T-99 or equivalent

Any pockets of organic debris or loose fill encountered during ripping or tilling should be removed and replaced with engineered fill (see *Site Preparation* Section). In order to verify subgrade strength, we recommend proof-rolling directly on subgrade with a loaded dump truck during dry weather and on top of base course in wet weather. Soft areas that pump, rut, or weave should be stabilized prior to paving. If pavement areas are to be constructed during wet weather, the subgrade and construction plan should be reviewed by the project geotechnical engineer at the

time of construction so that condition specific recommendations can be provided. The moisture sensitive subgrade soils make the site a difficult wet weather construction project.

During placement of pavement section materials, density testing should be performed to verify compliance with project specifications. Generally, one subgrade, one base course, and one asphalt compaction test is performed for every 100 to 200 linear feet of paving.

Spread Foundations

The proposed residential structures may be supported on shallow foundations bearing on competent undisturbed, native soils and/or engineered fill, appropriately designed and constructed as recommended in this report. Foundation design, construction, and setback requirements should conform to the applicable building code at the time of construction. For maximization of bearing strength and protection against frost heave, spread footings should be embedded at a minimum depth of 18 inches below exterior grade. The recommended minimum widths for continuous footings supporting wood-framed walls without masonry are 12 inches for single-story, 15 inches for two-story, and 18 inches for three-story structures. Minimum foundation reinforcement should consist of a No. 4 bar at the top of stem walls, and a No. 4 bar at the bottom of the footings.

The anticipated allowable soil bearing pressure is 1,500 lbs/ft^2 for footings bearing on competent, native soil and/or engineered fill. A maximum chimney and column load of 30 kips is recommended for the site. The recommended maximum allowable bearing pressure may be increased by 1/3 for short-term transient conditions such as wind and seismic loading. For heavier loads, the geotechnical engineer should be consulted. The coefficient of friction between on-site soil and poured-in-place concrete may be taken as 0.45, which includes no factor of safety. The maximum anticipated total and differential footing movements (generally from soil expansion and/or settlement) are 1 inch and ¾ inch over a span of 20 feet, respectively. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied. Excavations near structural footings should not extend within a 1H:1V plane projected downward from the bottom edge of footings.

Footing excavations should penetrate through topsoil and any loose soil to competent subgrade that is suitable for bearing support. All footing excavations should be trimmed neat, and all loose or softened soil should be removed from the excavation bottom prior to placing reinforcing steel bars. Due to the moisture sensitivity of on-site native soils, foundations constructed during the wet weather season may require overexcavation of footings and backfill with compacted, crushed aggregate.

Our recommendations are for house construction incorporating raised wood floors and conventional spread footing foundations. If living space of the structures will incorporate basements, a geotechnical engineer should be consulted to make additional recommendations for retaining walls, water-proofing, underslab drainage and wall subdrains. After site development, a Final Soil Engineer's Report should either confirm or modify the above recommendations.

Seismic Design

The Oregon Department of Geology and Mineral Industries (Dogami), Oregon HazVu: 2017 Statewide GeoHazards Viewer indicates that the site is in an area where *very strong* ground shaking is anticipated during an earthquake (Dogami HazVu, 2017). Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2015 International Building Code (IBC) with applicable Oregon Structural Specialty Code (OSSC) revisions (current 2014). We recommend Site Class D be used for design per the OSSC, Table

1613.5.2 and as defined in ASCE 7, Chapter 20, Table 20.3-1. Design values determined for the site using the USGS (United States Geological Survey) 2017 Seismic Design Maps Summary Report are summarized in Table 4, and are based upon existing soil conditions.

Table 4. Recommended Earthquake Ground Motion Parameters (2010 ASCE-7)

Parameter	Value
Location (Lat, Long), degrees	45.321, -122.619
Mapped Spectral Acceleration Values (MCE):	
Peak Ground Acceleration PGA_M	0.439
Short Period, S_s	0.914 g
1.0 Sec Period, S_1	0.397 g
Soil Factors for Site Class D:	
F_a	1.134
F_v	1.606
Residential Site Value = 2/3 x F_a x S_s	0.691 g
Residential Seismic Design Category	D

Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to earthquake shaking. Soil liquefaction is generally limited to loose, granular soils located below the water table. According to the Oregon HazVu: Statewide Geohazards Viewer, the subject site is regionally characterized as having a low risk of soil liquefaction (DOGAMI:HazVu, 2017).

Footing and Roof Drains

Construction should include typical measures for controlling subsurface water beneath the homes, including positive crawlspace drainage to an adequate low-point drain exiting the foundation, visqueen covering the expose ground in the crawlspace, and crawlspace ventilation (foundation vents). The homebuyers should be informed and educated that some slow flowing water in the crawlspaces is considered normal and not necessarily detrimental to the home given these other design elements incorporated into its construction. Appropriate design professionals should be consulted regarding crawlspace ventilation, building material selection and mold prevention issues, which are outside GeoPacific's area of expertise.

Down spouts and roof drains should collect roof water in a system separate from the footing drains to reduce the potential for clogging. Roof drain water should be directed to an appropriate discharge point and storm system well away from structural foundations. Grades should be sloped downward and away from buildings to reduce the potential for ponded water near structures.

If the proposed structures will have a raised floor, and no concrete slab-on-grade floors in living spaces are used, perimeter footing drains would not be required based on soil conditions encountered at the site and experience with standard local construction practices. Where it is desired to reduce the potential for moist crawl spaces, footing drains may be installed. If concrete slab-on-grade floors are used, perimeter footing drains should be installed as recommended below.

Where necessary, perimeter footing drains should consist of 3 or 4-inch diameter, perforated plastic pipe embedded in a minimum of 1 ft^3 per lineal foot of clean, free-draining drain rock. The drain pipe and surrounding drain rock should be wrapped in non-woven geotextile (Mirafi 140N, or approved equivalent) to minimize the potential for clogging and/or ground loss due to piping. A

minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. In our opinion, footing drains may outlet at the curb, or on the back sides of lots where sufficient fall is not available to allow drainage to meet the street.

UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and their consultants for use in design of this project only. This report should be provided in its entirety to prospective contractors for bidding and estimating purposes; however, the conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. The checklist attached to this report outlines recommended geotechnical observations and testing for the project. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, GeoPacific executed these services in accordance with generally accepted professional principles and practices in the field of geotechnical engineering at the time the report was prepared. No warranty, expressed or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.

CERTIFIED OREGON ELIZABETH K. RAPP No. E2180 ENGINEERING GEOLOGIST

REGISTERED PROFESSIONAL ENGINEER 14743PE OREGON JAN. 23, 1990 JAMES D. IMBRIE

EXPIRES: 06/30/2019

Beth K. Rapp, C.E.G.
Senior Engineering Geologist

James D. Imbrie, P.E.
Principal Engineer

Attachments: References
Figure 1A – Vicinity Map
Figure 1B – Lidar Based Vicinity Map with Mapped Landslides
Figure 2 – Site Plan and Exploration Locations
Test Pit Logs (TP-1 through TP-10)
Boring Logs (B-1 & B-2)

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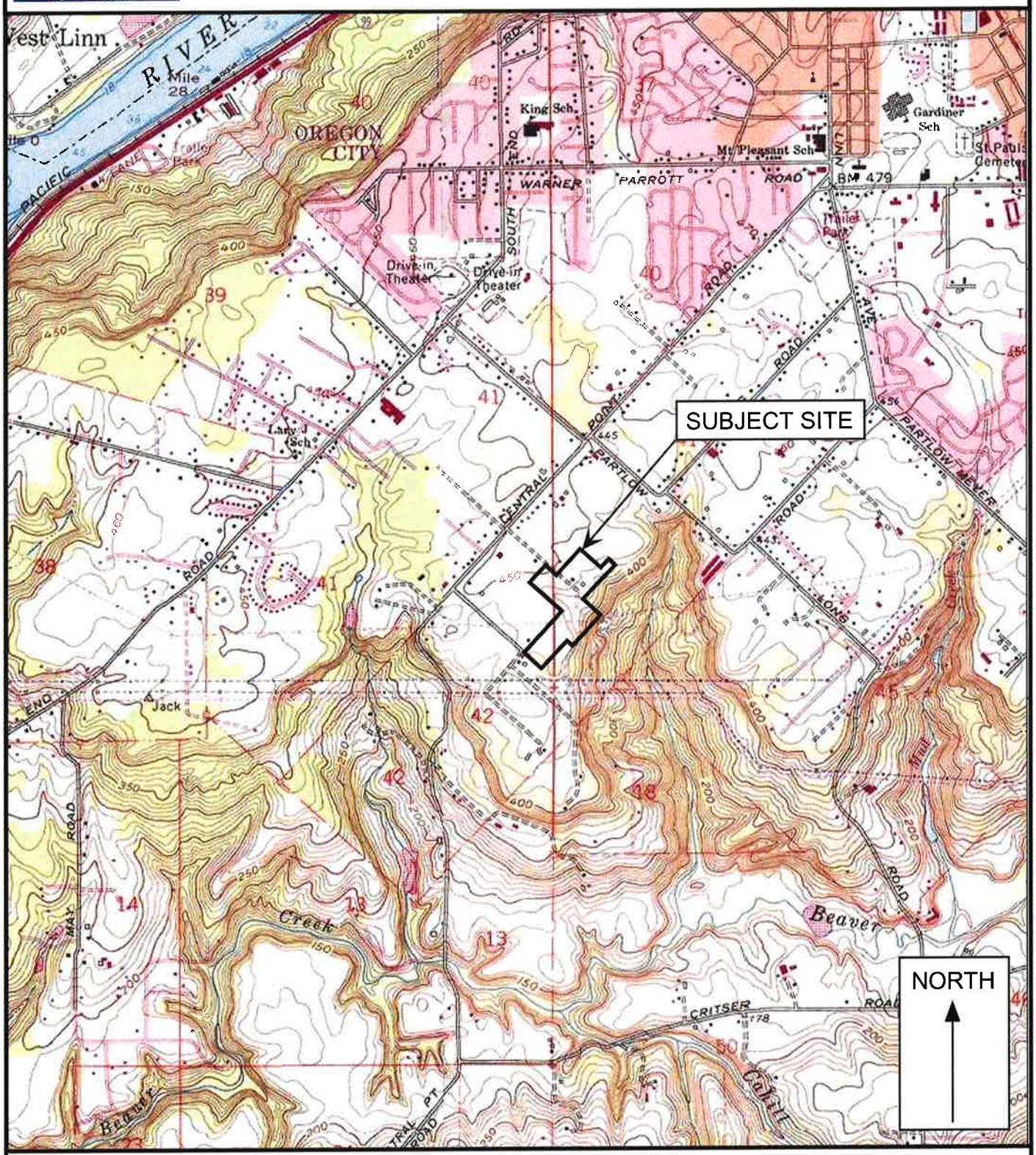
VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 ft

Date: 6/16/2017

Drawn by: SRS

Base maps: U.S. Geological Survey 7.5 minute Topographic Map Series, Canby, Oregon Quadrangle, 1961 (Photorevised 1985) and Oregon City, Oregon Quadrangle, 1961 (Photorevised 1985).

Project: Wheeler Farms Oregon City, Oregon	Project No. 17-4521	FIGURE 1A

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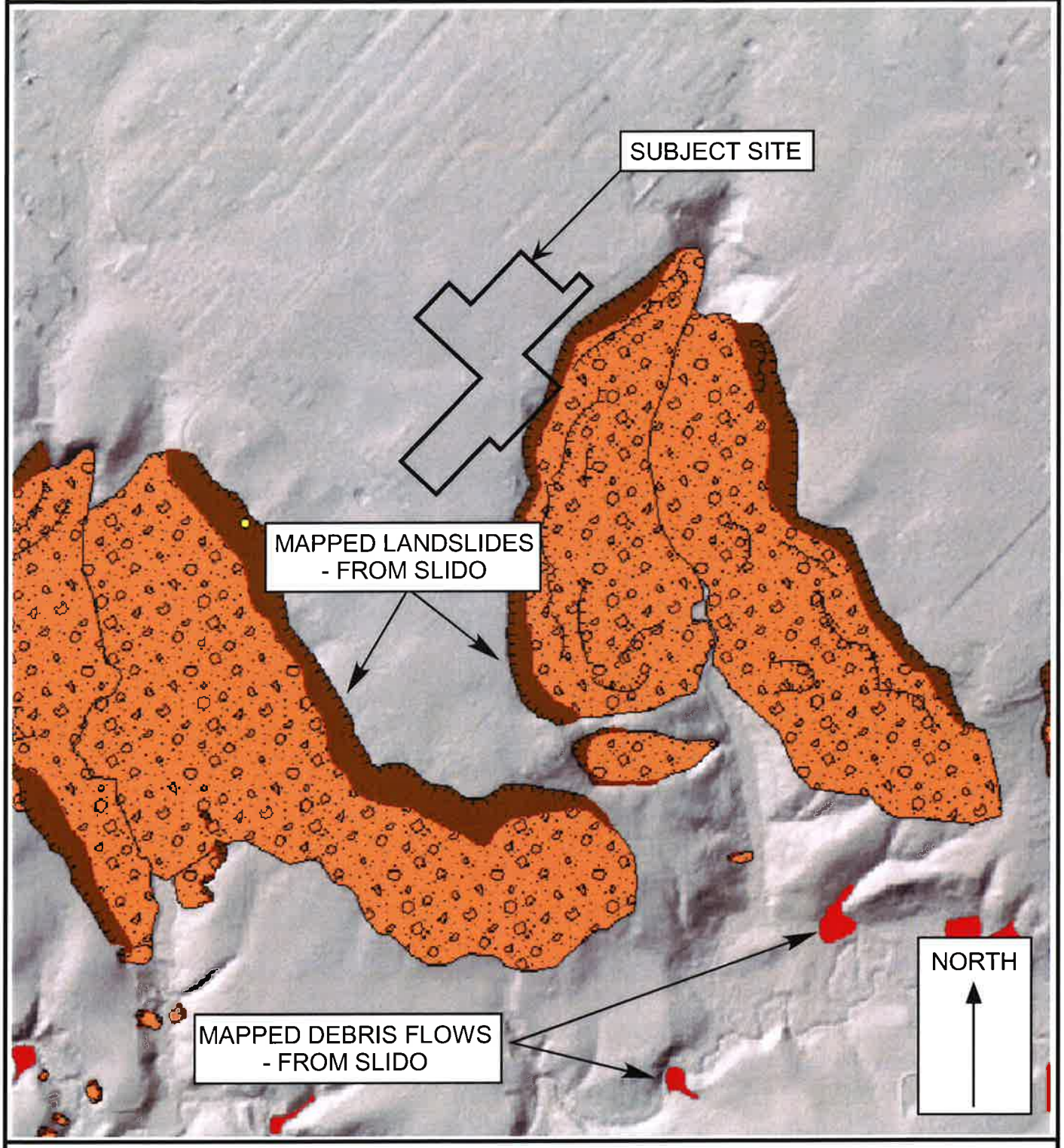
LIDAR BASED VICINITY MAP - WITH MAPPED LANDSLIDES



Legend

Approximate Scale 1 in = 1000 ft

Date: 6/16/2017
Drawn by: SRS

Base map: Oregon Department of Geology and Mineral Industries, 2017, Statewide Landslide Information Database for Oregon (SLIDO): http://www.oregongeology.org/slido/index.html

Project: Wheeler Farms Oregon City, Oregon	Project No. 17-4521	FIGURE 1B

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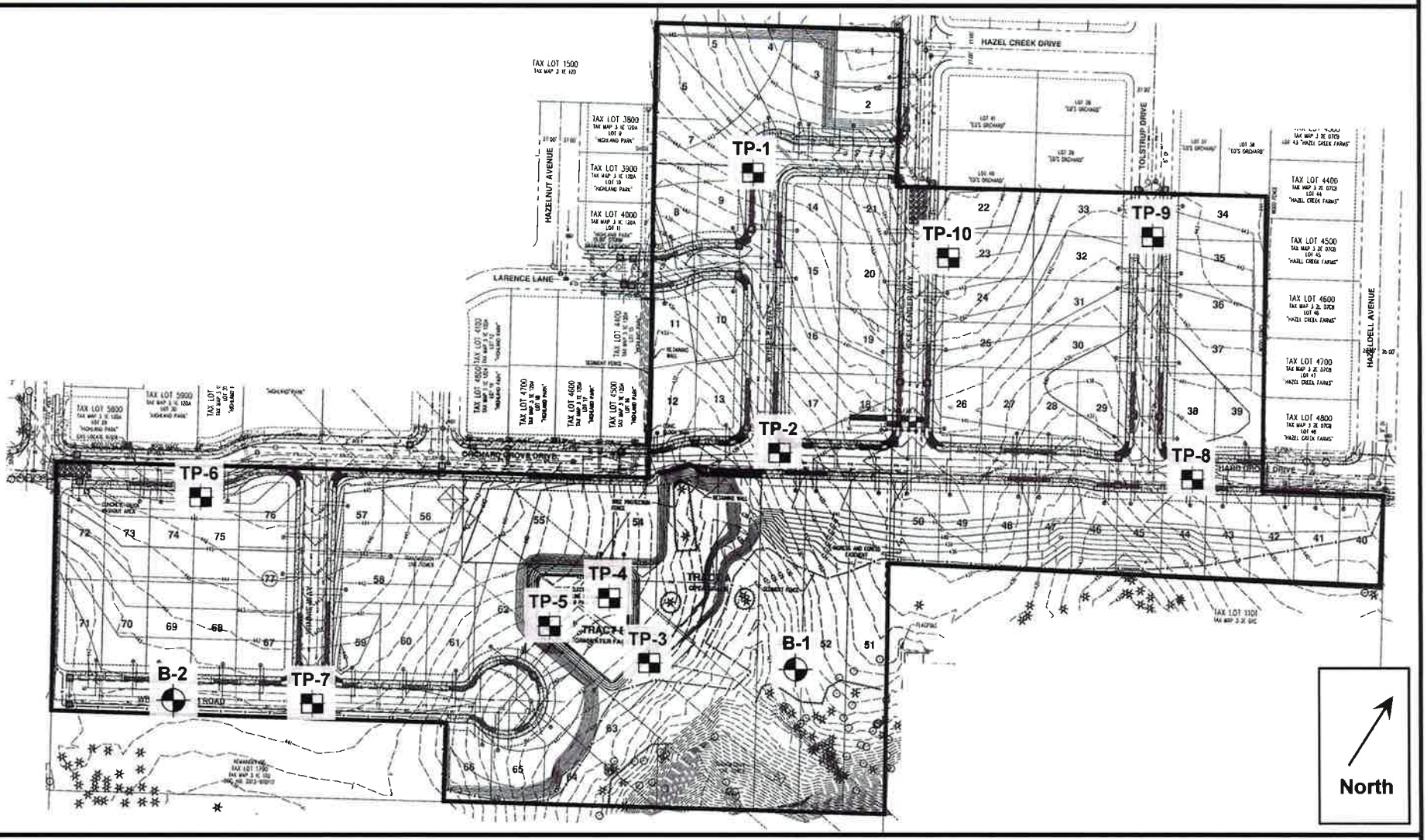
SITE PLAN AND EXPLORATION LOCATIONS



Legend

TP-1 — Test Pit Designation and Approximate Location

B-1 — Boring Designation and Approximate Location

0 200'

APPROXIMATE SCALE 1"=200'

Date: 6/16/2017
Drawn by: EKR

Project: Wheeler Farms Oregon City, Oregon	Project No. 17-4521	FIGURE 2

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TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-1**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately organic SILT (OL-ML), trace clay, brown, loose, 2 inch thick root mat, moist (Topsoil)
2	2.0					Stiff, clayey SILT (ML) to silty CLAY (CL), light brown, moist, (Residual Soil)
3	4.0					
4	3.0					Extremely soft to very soft (R0-R1), highly weathered BASALT, trace light reddish brown silty clay matrix, gray to brown, trace black staining, trace fine roots, moist (Boring Lava Formation)
5						
6						Trace subrounded soft (R2) boulders up to 2 feet in diameter below 5½ feet below ground surface
7						
8						
9						
10						
11						Test Pit Terminated at 10½ Feet.
12						Note: No seepage or groundwater encountered.

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Wheeler Farms Subdivision Oregon City, Oregon	Project No. 17-4521	Test Pit No. **TP-2**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately organic SILT (OL-ML), brown, loose, 3 inch thick root mat, trace roots throughout, moist (Topsoil)
2	2.0					Stiff to very stiff, clayey SILT (ML) to silty CLAY (CL), trace subrounded gray weathered basalt, light brown, trace roots, trace charcoal, moist, (Residual Soil)
3	3.0					
4	3.0					Extremely soft to very soft (R0-R1), highly weathered BASALT, trace light reddish brown silty clay matrix, gray to brown, trace black staining, trace roots to 4 feet below ground surface, moist (Boring Lava Formation)
5						Some soft (R2) zones and boulders below 5 feet below ground surface
6						
7						
8						
9						
10						
11						Test Pit Terminated at 10½ Feet.
12						Note: No seepage or groundwater encountered.

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-3**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately organic SILT (OL-ML), dark brown, loose, roots throughout, moist (Topsoil)
2	1.5					Stiff to very stiff, silty CLAY (CL), trace highly weathered gray basalt, light reddish brown, trace black staining, trace roots to 2½ feet below ground surface, moist (Residual Soil)
3	2.5					
4	2.5					Extremely soft to very soft (R0-R1), weathered BASALT, light reddish brown silty clay matrix, gray to brown, moist (Boring Lava Formation)
5						
6						
7						
8						
9						
10						Becomes very soft to soft (R1-R2) below 10 feet below ground surface
11						
12						Test Pit Terminated at 12 Feet. Note: No seepage or groundwater encountered.

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-4**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately organic SILT (OL-ML), brown, loose, roots throughout, moist (Topsoil)
2	2.0					Stiff to very stiff, silty CLAY (CL), trace weathered gray basalt, light reddish brown, moist (Residual Soil)
3	3.0					
4	4.0					
5						
6						
7						
8						
9						Extremely soft to very soft (R0-R1), highly weathered BASALT, trace light reddish brown silty clay matrix, gray to brown, moist (Boring Lava Formation)
10						
11						
12						Test Pit Terminated at 12 Feet. Note: No seepage or groundwater encountered.

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-5**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	2.0					Moderately organic SILT (OL-ML), dark brown, loose, roots throughout, moist (Topsoil)
2	2.0					Stiff to very stiff, silty CLAY (CL), trace weathered gray basalt, light reddish brown, trace black staining, trace roots to 4 feet below ground surface, moist (Residual Soil)
3	3.5					
4	4.5					
5						
6						Extremely soft to very soft (R0-R1), highly weathered BASALT, light reddish brown silty clay matrix, gray to brown, trace black staining, trace soft (R2) boulders, trace white secondary mineralization, moist (Boring Lava Formation)
7						
8						
9						
10						
11						
12						Test Pit Terminated at 12 Feet.
						Note: No seepage or groundwater encountered.

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-6**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
						Moderately organic SILT (OL-ML), dark brown, loose, 3 inch thick root mat, moist (Topsoil)
1	1.5					Stiff to very stiff, silty CLAY (CL), light reddish brown, trace black staining, trace roots, moist (Residual Soil)
2	2.5					
3	3.5					
4	4.0					
5						
6						
7						Extremely soft (R0), highly weathered BASALT, trace light reddish brown silty clay matrix, gray to brown, moist (Boring Lava Formation)
8						
9						
10						Test Pit Terminated at 10 Feet.
11						Note: No seepage or groundwater encountered.
12						

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
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TEST PIT LOG

Project: Wheeler Farms Subdivision Oregon City, Oregon	Project No. 17-4521	Test Pit No. **TP-7**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	2.0					Moderately organic SILT (OL-ML), brown, loose, fine roots throughout, moist (Topsoil)
2	2.0					Very stiff, clayey SILT (ML) to silty CLAY (CL), subrounded gray basalt below 4 feet below ground surface, trace light reddish brown, mottled, trace black staining, moist (Residual Soil)
3	4.5					
4	4.5					
5						
6						
7						
8						Extremely soft (R0), highly weathered BASALT, trace clayey silt to silty clay matrix, brown to gray, moist (Boring Lava Formation)
9						
10						
11						Test Pit Terminated at 11 Feet. Note: No seepage or groundwater encountered.
12						

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-8**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
0						Moderately organic SILT (OL-ML), dark brown, loose, 3 inch thick root mat, fine roots throughout, moist (Topsoil)
1	1.5					Very stiff, clayey SILT (ML) to silty CLAY (CL), trace gray basalt, light reddish brown, trace black staining, trace roots to 4 feet below ground surface, moist (Residual Soil)
	3.5					
2	1.0					
	2.0					
3	3.0					
4	4.5					Extremely soft to very soft (R0-R1), highly weathered BASALT, trace light reddish brown silty clay matrix, trace soft (R2) boulders at 5 feet below ground surface, moist (Boring Lava Formation)
5						
6						
7						
8						
9						
10						
11						Test Pit Terminated at 11 Feet.
12						Note: No seepage or groundwater encountered.

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-9**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
						Moderately organic SILT (OL-ML), dark brown, loose, 5 inch thick root mat, trace fine roots, moist (Topsoil)
1	1.0					Stiff to very stiff, clayey SILT (ML) to silty CLAY (CL), trace gray basalt, light brown, moist (Residual Soil)
	2.0					
2	2.5					
3	4.5					
4	4.5					Extremely soft to very soft (R0-R1), highly weathered, BASALT, trace silty clay matrix, brown to gray, secondary mineralization, moist (Boring Lava Formation)
5						
6						
7						
8						
9						
10						
11						Test Pit Terminated at 10½ Feet.
12						Note: Groundwater seepage encountered at 6 feet. Discharge visually estimated at less than ¼ gallon per minute.

LEGEND

Bag Sample (100 to 1,000 g) | Bucket Sample (5 Gal. Bucket) | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-10**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
						Moderately organic SILT (OL-ML), dark brown, loose, 5 inch thick root mat, trace fine roots, moist (Topsoil)
1	1.0					Stiff to very stiff, clayey SILT (ML) to silty CLAY (CL), trace weathered basalt, light brown, roots to 2½ feet below ground surface, moist (Residual Soil)
	2.0					
2	2.0					
3	2.5					
4	4.5					Extremely soft (R0), highly weathered, BASALT, trace light reddish brown clayey silt to silty clay matrix, gray brown, secondary mineralization, moist (Boring Lava Formation)
5						
6						
7						
8						
9						
10						Test Pit Terminated at 10 Feet.
11						Note: No seepage or groundwater encountered.
12						

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

BORING LOG

Project: Wheeler Farms Subdivision Oregon City, Oregon	Project No. 17-4521	Boring No. **B-1**

Depth (ft)	Sample Type	N-Value	Installation	Moisture Content (%)	Water Bearing Zone	Material Description
						Moderately organic, SILT (OL-ML), brown, trace fine roots, moist (Topsoil)
						Stiff, clayey SILT (ML) to silty CLAY (CL), trace basalt, brown, moist (Residual Soil)
		4				Medium stiff, extremely soft (R0), BASALT, trace light reddish brown silty clay to clayey silt matrix, gray, trace red staining, moist (Boring Lava Formation)
5		8				
		11				Stiff, extremely soft (R0) to very soft (R1), BASALT, trace light reddish brown silty clay to clayey silt matrix, gray, trace red staining, moist (Boring Lava Formation)
10		50 for 1"				Hard, soft (R2) to medium hard (R3), BASALT, trace light reddish brown silty clay to clayey silt matrix, gray, trace red staining, moist (Boring Lava Formation)
15		50 for <1"				
20		18				Very stiff, clayey SILT (ML), trace fine grained sand, light brown, strong dark red mottling, trace waxy texture, dark brown staining, micaceous, uniform, no bedding planes, moist (Residual Soil of Troutdale Formation)
25		14				
30		50 for 4½"				Hard, extremely soft (R0) to very soft (R1) MUDSTONE, brown to brownish gray, trace yellow and green secondary mineralization, micaceous, trace laminar bedding, moist (Troutdale Formation)
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Excavated: 5/9/2017 to 5/10-2017

Logged By: B. Rapp

Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

BORING LOG

Project: Wheeler Farms Subdivision Oregon City, Oregon	Project No. 17-4521	Boring No. **B-1**

Depth (ft)	Sample Type	N-Value	Installation	Moisture Content (%)	Water Bearing Zone	Material Description
		41				
40		50 for 5½"				
45		53				Hard, extremely soft (R0) to very soft (R1) MUDSTONE, brown to brownish gray, trace yellow and green secondary mineralization, micaceous, trace laminar bedding, moist (Troutdale Formation)
50		65				
55		62				
60		70				Very dense, extremely soft (R0), weathered SANDSTONE, trace silt, gray and brown, weathered to fine to medium grained sand, trace yellow secondary mineralization, micaceous, preserved bedding planes, sugary texture, some zones of extremely soft (R0) mudstone, damp to moist (Troutdale Formation)
65		64				
70						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-09) | Water Bearing Zone

Date Excavated:
5/9/2017 to 5/10-2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

BORING LOG

Project: Wheeler Farms Subdivision Oregon City, Oregon	Project No. 17-4521	Boring No. **B-1**

Depth (ft)	Sample Type	N-Value	Installation	Moisture Content (%)	Water Bearing Zone	Material Description
75		56				
		50 for 5¾"				
80		50 for 5"				Very dense, extremely soft (R0), weathered SANDSTONE, trace silt, gray and brown, weathered to fine to medium grained sand, trace yellow secondary mineralization, micaceous, preserved bedding planes, sugary texture, some zones of extremely soft (R0) mudstone, damp to moist (Troutdale Formation)
85		80				
90		58				
95		75				
100		67				
105						Boring Terminated at 101½ Feet. Groundwater could not be determined due to mud rotary techniques.

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Excavated: 5/9/2017 to 5/10-2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

BORING LOG

Project: Wheeler Farms Subdivision Oregon City, Oregon	Project No. 17-4521	Boring No. **B-2**

Depth (ft)	Sample Type	N-Value	Installation	Moisture Content (%)	Water Bearing Zone	Material Description
						Moderately organic, SILT (OL-ML), brown, trace fine roots, moist (Topsoil)
						Stiff to very stiff, clayey SILT (ML) to silty CLAY (CL), trace weathered basalt, light brown, moist (Residual Soil)
5		17				Stiff to very stiff, extremely soft (R0), highly weathered, BASALT, trace light reddish brown silty clay to clayey silt matrix, gray to brown, strong mottling, trace black staining, moist to very moist (Boring Lava Formation)
10		13				
15		18				Very stiff, extremely soft to very soft (R0-R1), highly weathered, BASALT, trace silty clay to clayey silt matrix, gray, trace black staining, red staining, moist to very moist (Boring Lava Formation)
20		50 for 1"				
25						Hard, soft to medium hard (R2-R3), BASALT, gray, trace silty clay to clayey silt matrix, gray, trace black staining, red staining, moist to very moist (Boring Lava Formation)
30						
35		50 for ½"				Boring Terminated at 35 Feet. Groundwater could not be determined due to mud rotary techniques.

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Excavated: 5/10/2017
Logged By: B. Rapp
Surface Elevation:

Exhibit J: Type I Natural Resource Overlay District Verification (NR 17-03)

OREGON CITY

Community Development – Planning

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

TYPE I NATURAL RESOURCE OVERLAY DISTRICT VERIFICATION
May 19, 2017

FILE NUMBER:	NR 17-03: Type I Natural Resource Overlay District Verification
APPLICANT:	Rian Park Development, Inc. P.O. Box 2559 Oregon City, OR 97045
OWNERS:	32E07C Tax Lot 1001 (Wheeler Family Enterprises, LLC) 32E07C Tax Lots 1100, 1180 (David H. Wheeler Sr. Trust) 32E07C Tax Lot 1291 (Donald W. & Roxanne O. Wheeler) 31E12D Tax Lots 1700, 1790 (Wheeler Family Enterprises, LLC)
CONSULTANT:	AKS Engineering & Forestry, LLC 12965 SW Herman Road, Suite 100 Tualatin, OR 97062
REQUEST:	The applicant submitted a request for a Type I Natural Resource Overlay District Verification with a professionally prepared assessment to demonstrate that the subject site is not within the Natural Resource Overlay District.
LOCATION:	NO SITUS ADDRESS: Clackamas County Tax Map: 32E07C, Tax Lots: 1001, 1180, & 1291 / 31E12D, Tax Lots: 1700 & 1790; and 19566 Central Point Rd, Oregon City, OR 97045, Clackamas County Tax Map: 32E07C, Tax Lot 1100
ZONING:	"R-10", Single Family Residential District
DECISION:	Approval
REVIEWER:	Pete Walter, AICP, Planner
CRITERIA:	OCMC Chapter 17.49 – Natural Resource Overlay District OCMC Chapter 17.50 – Administration and Procedures

Type I decisions do not require interpretation or the exercise of policy or legal judgment in evaluating approval criteria and include lot line adjustments, zone changes upon annexation as provided in Section 17.06.050 for which there is no discretion provided, final plats, and final planned unit development plans where there are no material deviations from the approved preliminary plans. Because no discretion is involved, Type I decisions do not qualify as a land use, or limited land use, decision. The decision-making process requires no notice to any party other than the applicant. One representative from each of the city-recognized neighborhood associations, who has been identified by the neighborhood coordinator, will be distributed a monthly compilation of all Type I activities. The Community Development Director's decision is final and not appealable by any party through the normal city land use process. IF YOU HAVE ANY QUESTIONS ABOUT THIS APPLICATION, PLEASE CONTACT THE PLANNING DIVISION OFFICE AT (503) 722.3789.

I. BACKGROUND

The subject properties are located southeast of Central Point Road on the southern boundary of the City. The area was historically pastureland, Christmas trees and orchard land that was brought into the Metro Urban Growth Boundary in 2001 or earlier in 1979. The lands in question were annexed to Oregon City in 2006 (File AN 16-02) and have a zoning designation of R-10 Single Family Residential. There has been a lot of recent subdivision and home construction in the area over the last 10 years abutting the site to the northwest, and it is anticipated that this land will be used in the same manner.

As shown in Figure 1, the subject site is partially located within the mapped Natural Resource Overlay District (NROD), and is thus subject to review by the City of Oregon City to ensure adequate protection of nearby water features and associated vegetated corridors.

The Oregon City Municipal Code protects degradation of water features enforcing a vegetated corridor consisting of native plantings adjacent to the identified feature (e.g. stream or wetland) to improve water quality and functions. The applicant has requested an exemption from the Natural Resource Overlay District. Approval of this verification application would exempt the property from further NROD review pursuant with Chapter 17.49 of the Oregon City Municipal Code.

Figure 1: Subject Site and Mapped NROD

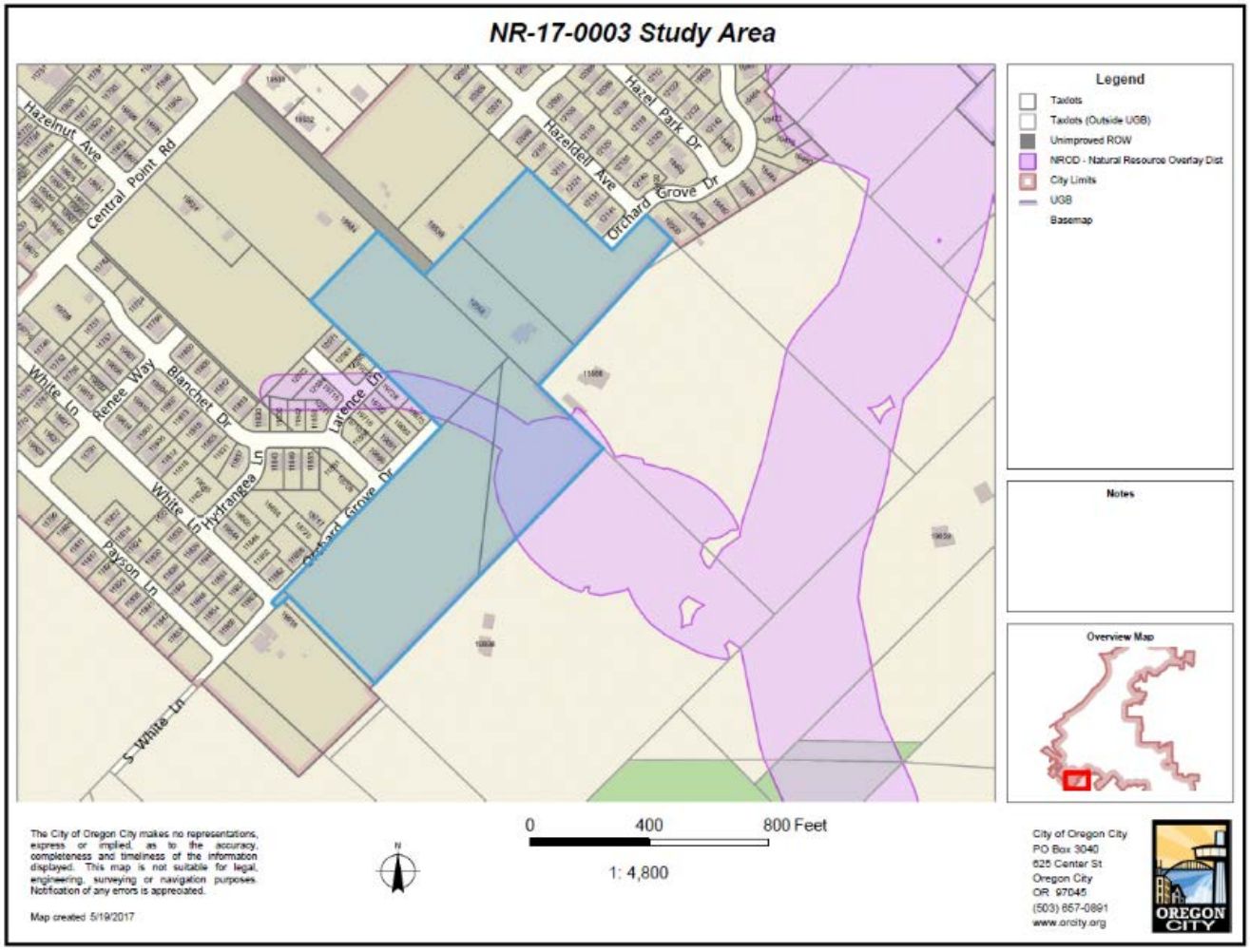
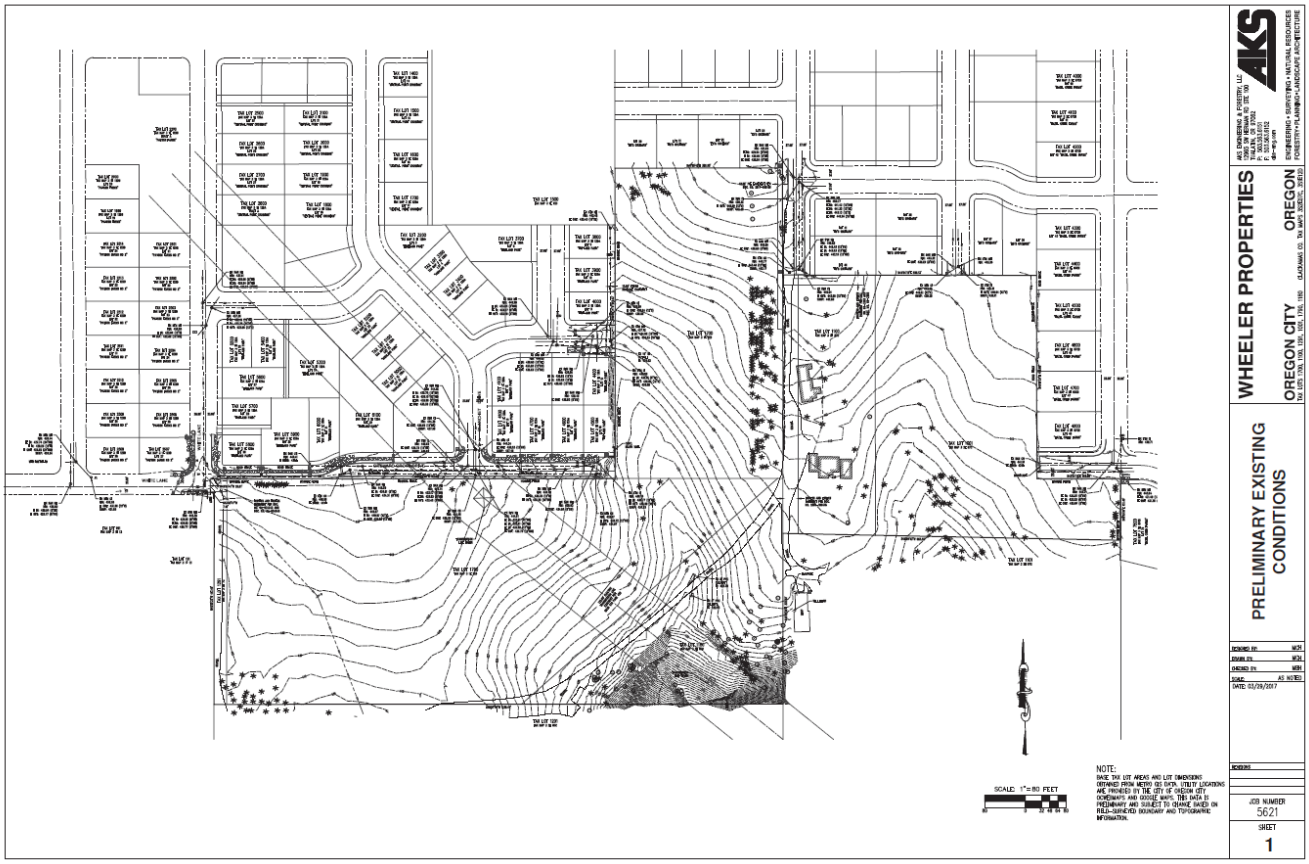


Figure 2: Existing Conditions Map from Applicant's Natural Resources Assessment



II. ANALYSIS AND FINDINGS

CHAPTER 17.49 NATURAL RESOURCE OVERLAY DISTRICT

17.49.250 Verification of NROD Boundary

The NROD boundary may have to be verified occasionally to determine the true location of a resource and its functional values on a site. This may through a site specific environmental survey or, in those cases where existing information demonstrates that the NROD significance rating does not apply to a site-specific area. Applications for development on a site located in the NROD area may request a determination that the subject site is not in an NROD area and therefore is not subject to the standards of Section 17.49.100. Verifications shall be processed as either a Type I or Type II process.

Finding: Applicable. The City of Oregon City's maps show a perennial stream that originates off-site to the west and flows into the center of the subject site. A Natural Resource Assessment dated April 3, 2017 has been prepared concluding that no potentially jurisdictional Title 3 wetlands or waters, or associated vegetated corridors were documented on-site and that the stream identified in the City's mapping is not present on the subject property. No development is associated with this application and it has been determined that a Type I NROD Verification application can accomplish the requested concurrence that the subject property is not in an NROD area.

17.49.255 - Type I verification.

A. Applicants for a determination under this section shall submit a site plan meeting the requirements of Section 17.49.220, as applicable.

Finding: Complies as Proposed. The applicant submitted a Natural Resource Assessment prepared by Lindsey Obermiller, Natural Resource Specialist, including site plans in accordance with Section 17.49.220, as applicable. The Natural Resource Assessment included in the application materials includes site plans and conclusions that no evidence of the characteristics found in criteria B.1. – B.6. exist on the subject site.

B. Alternatively, an applicant may request a Type I Verification determination by the community development director by making an application therefore and paying to the city a fee as set by resolution of the city commission. Such requests may be approved provided that there is evidence substantiating that all the requirements of this chapter relative to the proposed use are satisfied and demonstrates that the property also satisfies the following criteria, as applicable:
1. No soil, vegetation, hydrologic features have been disturbed;
2. No hydrologic features have been changed;
Finding: Complies as proposed. The applicant has not requested that the Community Development Director make this determination. The Natural Resources Assessment and Wetland Determination Data Forms submitted by the applicant provides the necessary evidence that the criteria for exemption are met.

3 There are no man-made drainage features, water marks, swash lines, drift lines present on trees or shrubs, sediment deposits on plants, or any other evidence of sustained inundation.
Finding: Complies as Proposed. The Natural Resources Assessment and Wetland Determination Data Forms submitted by the applicant identify that the site did not have any observable water marks, swash lines, drift lines on trees or shrubs, sediment deposits on plants, or any other evidence of sustained inundation in the vicinity of the steel building onsite.

4. The property does not contain a wetland as identified by the city's local wetland inventory or water quality and flood management areas map.
Finding: Complies as Proposed. The City's local wetland inventory and NROD map do not identify a wetland at the property. The Natural Resources Assessment and Wetland Delineation Data Forms submitted by the applicant also conclude that the site and adjacent locations do not possess any jurisdictional Title 3 wetlands or waters, or associated vegetated corridors.

5. There is no evidence of a perennial or intermittent stream system or other protected water feature. This does not include established irrigation ditches currently under active farm use, canals or manmade storm or surface water runoff structures or artificial water collection devices.
Finding: Complies as Proposed. The Natural Resources Assessment and Wetland Determination Data Forms submitted by the applicant identify that the site did not contain evidence of perennial or intermittent stream or other protected water features.

6. Evidence of prior land use approvals that conform to the City's existing Water Quality Resource Area Overlay District.
There is an existing physical barrier between the site and a protected water feature, including:
a. Streets, driveways, alleys, parking lots or other approved impervious areas wider than fifteen feet and which includes drainage improvements that are connected to the city storm sewer system, as approved by the city.
b. Walls, buildings, drainages, culverts or other structures and which form a physical barrier between the site and the protected water features, as approved by the city.
Finding: Complies as proposed. The Highland Park subdivision uphill and abutting the property received land use approval which included a prior NROD exemption regarding the subject mapped resource (Planning File TP 15-01, NR 14-08).

C. If a the city is not able to clearly determine, through the Type I verification process that the applicable criteria subsection B.1.—B.6. above are met the verification application shall be denied. An applicant may then opt to apply for a verification through the Type II process defined below.
Finding: Not Applicable. The applicant's submittal adequately demonstrates that a protected feature and associated vegetated buffer are not present onsite, and that the criteria in subsections B.1-B.6 are met. A Type II verification is not required.

17.49.260. Type II Verification
Finding: Not Applicable. The application does not include a Type II Verification request.

17.49.265 - Corrections to violations.
For correcting violations, the violator shall submit a remediation plan that meets all of the applicable standards of the NROD. The remediation plan shall be prepared by one or more qualified professionals with experience and credentials in natural resource areas, including wildlife biology, ecology, hydrology and forestry. If one or more of these standards cannot be met then the applicant's remediation plan shall demonstrate that there will be:
A. No permanent loss of any type of resource or functional value listed in Section 17.49.10, as determined by a qualified environmental professional;
B. A significant improvement of at least one functional value listed in section 17.49.10, as determined by a qualified environmental professional; and
C. There will be minimal loss of resources and functional values during the remediation action until it is fully established.
Finding: Not Applicable. No violations have been reported. Therefore, a remediation plan for the violation is not required.

CHAPTER 17.50 - ADMINISTRATION AND PROCEDURES
17.50.030 Summary of the City's Decision-Making Processes.
Finding: Complies as Proposed. The Natural Resource Overlay District verification application is being reviewed pursuant to the Type I process.

III. CONCLUSION AND DECISION

Based on the analysis and findings presented in this report, and the substantial evidence in the application materials, the properties identified are exempt from further review under Chapter 17.49 of the Oregon City Municipal Code. Though the site is exempt from further NROD review, portions of the property also fall within the Geologic Hazards Overlay District and development is subject to compliance with OCMC Chapter 17.44, *Geologic Hazards* at the time of land division application.

EXHIBITS

1. Vicinity Map (On File)
2. Map of the Site and Natural Resources Overlay District (On File)
2. Applicant's Submittal (On File)

TUALATIN · VANCOUVER · SALEM-KEIZER
12965 SW HERMAN RD., SUITE 100 · TUALATIN, OR 97062
AKS ENGINEERING & FORESTRY
WWW.AKS-ENG.COM
P: (503) 563-6151 F: (503) 563-6152

Natural Resource Assessment

DATE: April 3, 2017

TO: Oregon City Planning Department, Oregon

FROM: Kayla Katkin, Natural Resource Specialist – AKS Engineering & Forestry, LLC

SUBJECT: Type 1 Verification - Natural Resource Assessment

PROJECT: Wheeler Farms

Introduction and Background

Rian Park Development contracted AKS Engineering and Forestry, LLC (AKS) to conduct a map verification at 19566 South Central Point Road in Oregon City, Clackamas County, Oregon (Tax Lots 1001, 1291, 1180, and 1100 of Tax Map 3 2E 7C and Tax Lots 1700 and 1790 of Tax Map 3 1E 12D) as seen on the attached Figures 1 and 2A and 2B. The Oregon City Natural Resource Overlay District (NROD) Map shows a perennial stream that originates off site to the west and flows through the project area (Figure 5). Our site visit determined this resource is not present on the site or immediately off-site to the west.

This memo has been prepared to meet the Oregon City Code of Ordinances application requirements listed under Chapter 17.49.250 Type 1 Verification, to request a determination that the project area does not include an NROD area and is therefore not subject to the NROD standards.

Existing Conditions

The methodology used to determine the presence of wetlands followed the U.S. Army Corps of Engineers (Corps) *Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010), used by both the Corps and the Oregon Department of State Lands (DSL). Kayla Katkin and Lindsey Obermiller documented the site conditions on March 15, 2017. They recorded soils, vegetation, and indicators of hydrology at two sample plot locations to document representative site conditions.

A single-family home, detached shop, and outbuildings are on Tax Lot 1100 on Tax Map 3 2E 7C. Tax Lots 1700 and half of Tax Lot 1001 are used as a filbert orchard. Tax Lot 1790 is primarily used as a Christmas tree farm, and Tax Lot 1291 contains a driveway. The southern portion of Tax Lot 1180 is dominated by big-leaf maple (*Acer macrophyllum*), Douglas-fir (*Pseudotsuga menziesii*), red alder (*Alnus rubra*), beaked hazelnut (*Corylus cornuta*), and pineland sword fern (*Polystichum munitum*), and slopes steeply (>25%) to the south toward an off-site drainage. Topography on remaining portions of the site have a gentle (less than 3 percent) southeasterly slope.

According to the Natural Resources Conservation Service (NRCS) Clackamas County, Oregon Area soil survey map and the Clackamas County hydric soils list, non-hydric Bornstedt silt loam with 0 to 8% slopes (Unit 8B) is mapped in the northern portion of the site and non-hydric soils Jory stony silt loam with 3-8% slopes (Unit 46B) and Xerochrepts and Haploxerolls, very steep slopes (Unit 92F) are mapped in the southern portion of

the site (Figure 3). There are no wetlands or waters mapped on the site according to the DSL approved 1999 Oregon City Local Wetland Inventory (LWI) map (Figure 4A and 4B).

Plots 1 and 2 document the conditions within the on-site mapped NROD. Plot 1 is at the lowest point within the planted Christmas tree farm in the vicinity of the mapped NROD. Plot 2 is also located in a low topographic area within the mapped NROD and upslope of a small diameter culvert under a gravel driveway along the southern property line of Tax Lot 1180. There was no defined channel upslope or downslope of the culvert. No defined channel was present upstream or downstream of the culvert.

Planted Douglas-fir dominated the vegetation at both plots. Soils were a dark reddish brown silt loam (with chromas of 3 and 4) and did not meet hydric soil indicators. Both plots lacked wetland hydrology indicators. Therefore, the area was determined to be upland.

No man-made drainage features, water marks, swash lines, drift lines on trees or shrubs, sediment deposits on plants, or any other evidence of sustained inundation was observed on the site. The approximate location of sample Plots 1 and 2 are shown on attached Figure 6, Existing Conditions Map. The wetland determination data sheets and representative site photos are also attached (Attachments A and B).

Summary

No potentially jurisdictional Title 3 wetlands or waters, or associated vegetated corridors were documented within the project area. Therefore, we request that Oregon City update the online geographic information system (GIS) mapping to reflect current site conditions and the absence of any on-site streams or buffers.

Please do not hesitate to contact me with any questions concerning the proposed project.

K. Katkin

Kayla Katkin
Natural Resource Specialist
Field work and report preparation

Stacey Reed

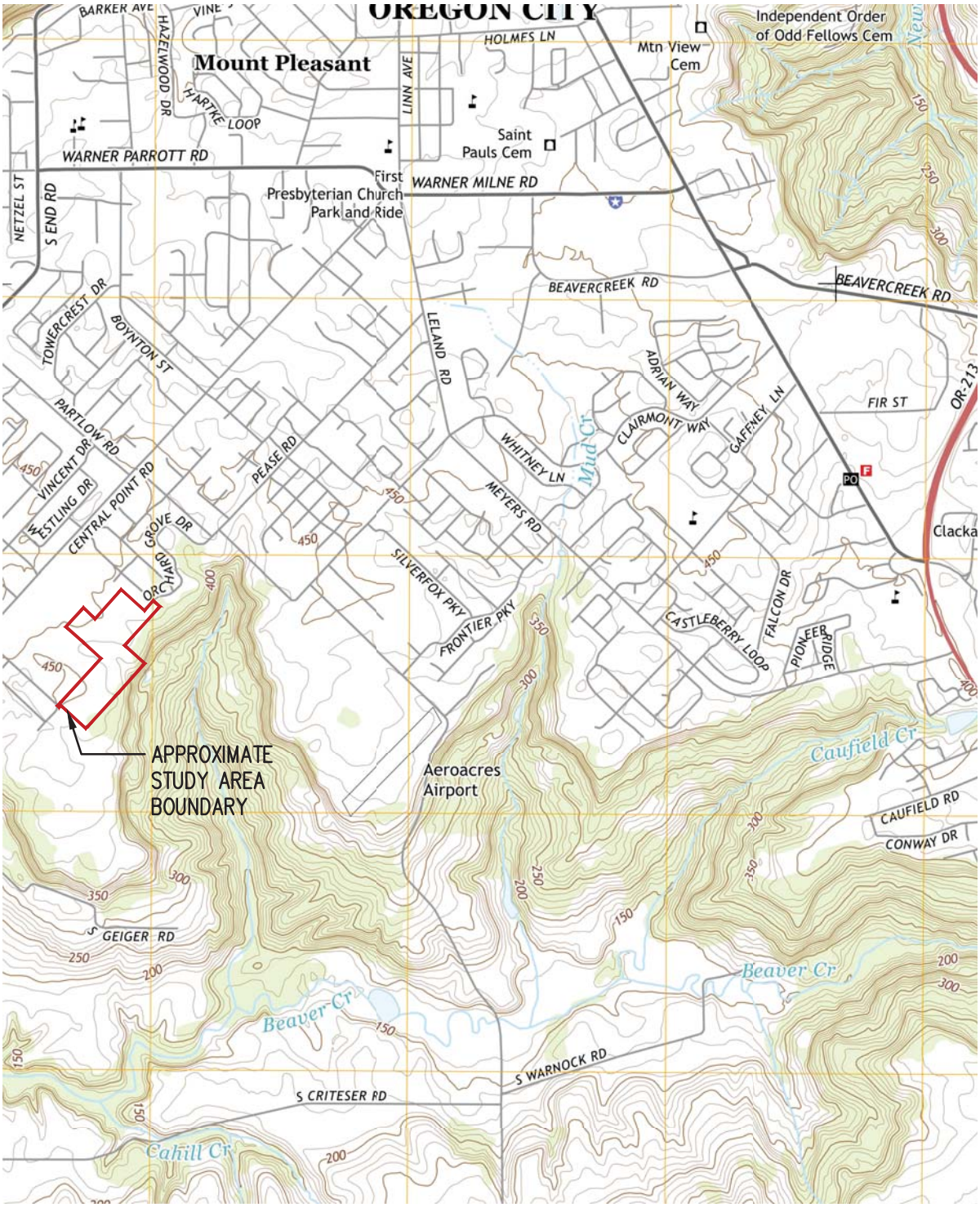
Stacey Reed, PWS
Senior Wetland Scientist
Report review

List of Attached Figures

Figure 1. Vicinity Map
Figure 2. Tax Lot Map
Figure 3. Soils Map
Figure 4. Oregon City Local Wetland Inventory Map
Figure 5. Oregon City GIS NROD Map
Figure 6. Existing Conditions Map

List of Attachments

Attachment A: Wetland Determination Data Sheets
Attachment B: Representative Site Photographs



N

SCALE 1" = 2000 FEET

2000 0 2000

USGS 7.5' TOPOGRAPHIC
QUADRANGLE: OREGON CITY, OR (2014)

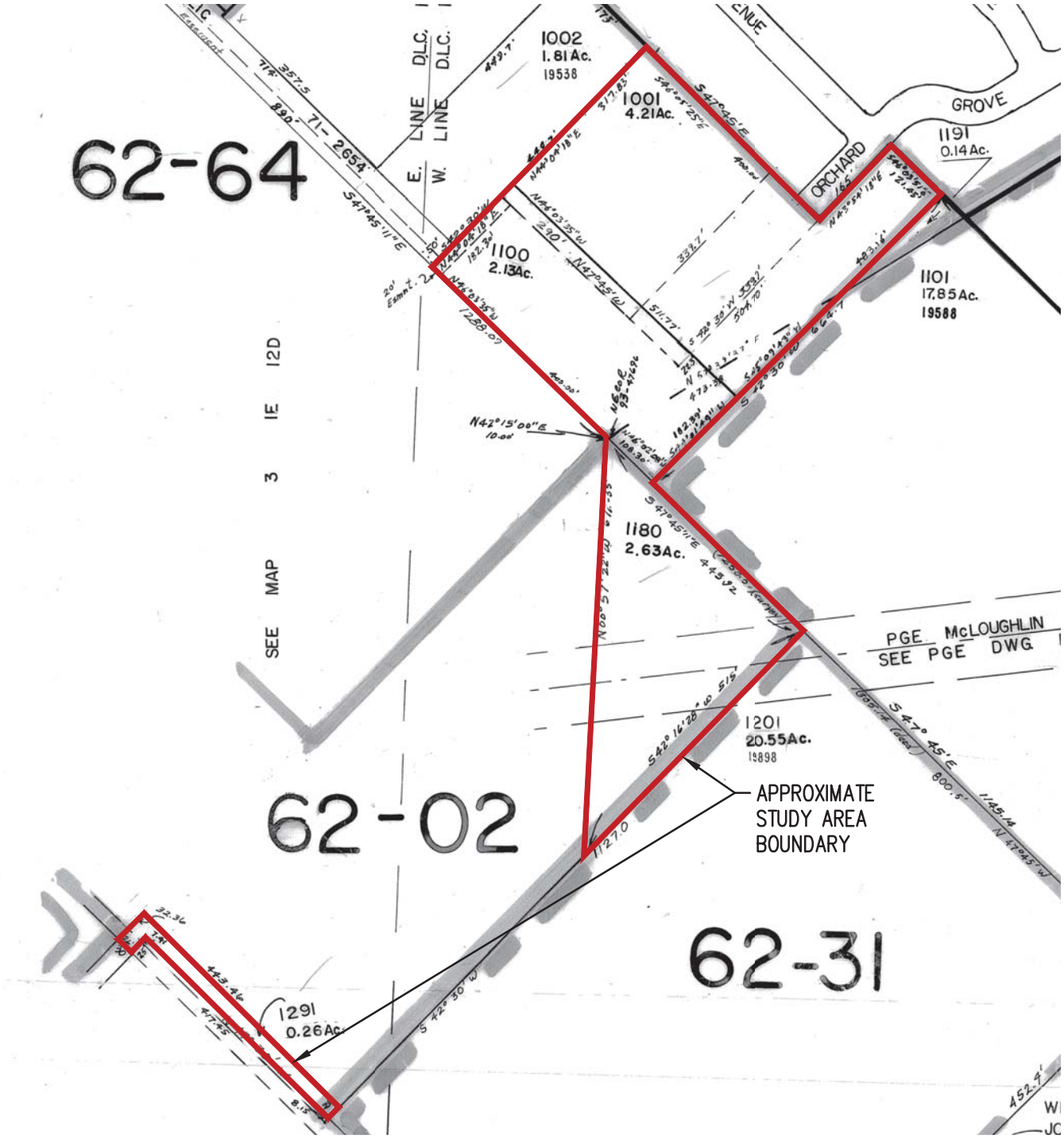
DATE: 03/20/2017

VICINITY MAP
WHEELER FARMS NATURAL RESOURCE ASSESSMENT

FIGURE 1

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD SUITE 100
TUALATIN, OR 97062 www.aks-eng.com
PHONE: 503.563.6151 FAX: 503.563.6152

DRWN: KMK
CHKD: SAR
AKS JOB: 5621



N

SCALE 1" = 250 FEET

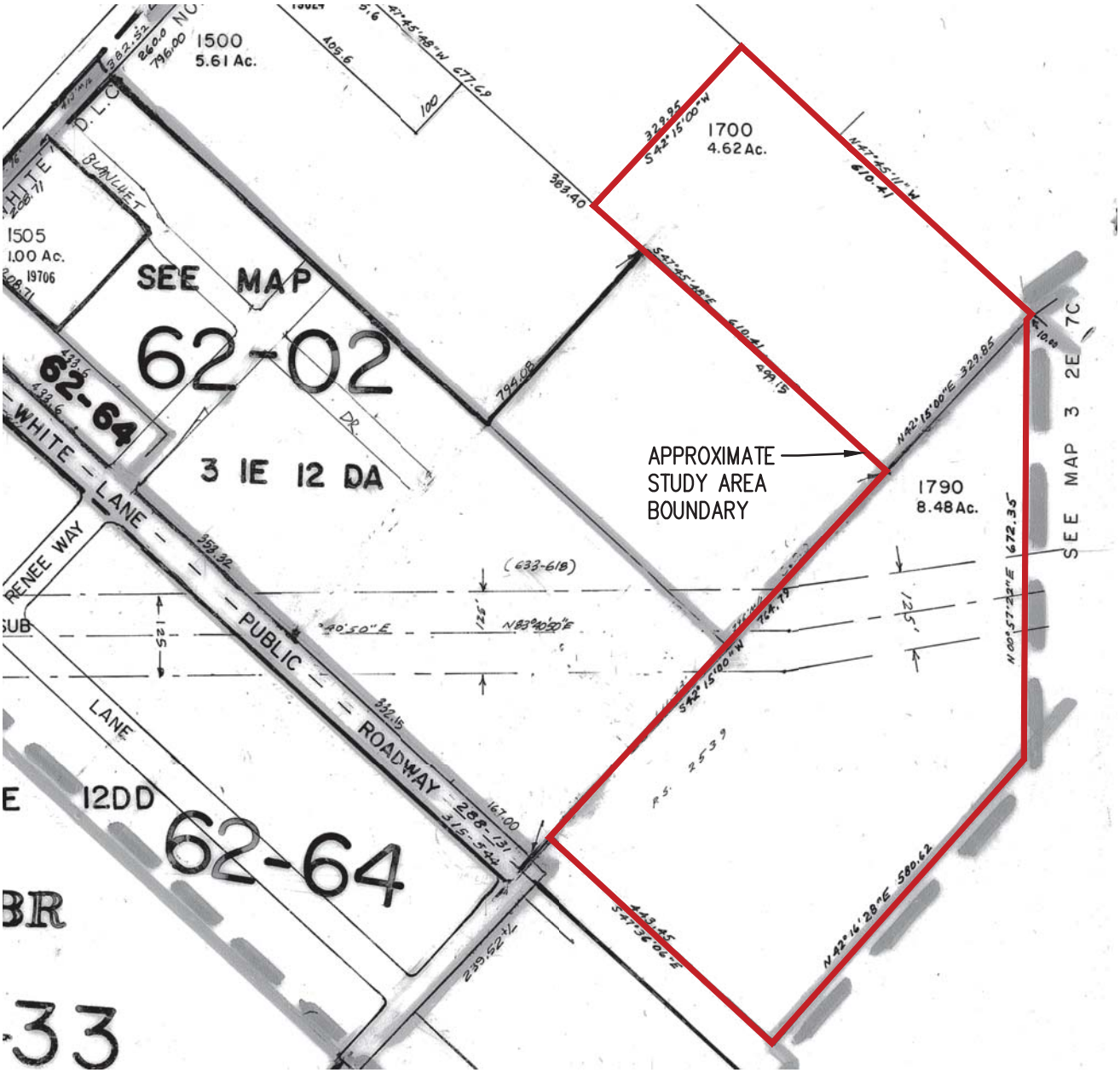
250 0 250

TAX MAP 3 2E 7C
PORTION OF TAX LOTS
1001, 1100, 1180, 1291

DATE: 03/20/2017

TAX MAP (MAP 3 2E 7C) WHEELER FARMS NATURAL RESOURCE ASSESSMENT	FIGURE 2A
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD SUITE 100 TUALATIN, OR 97062 www.aks-eng.com PHONE: 503.563.6151 FAX: 503.563.6152	DRWN: KMK CHKD: SAR AKS JOB: 5621

DWG: 5621 REPORT FIGURES | FIGURE 2A



TAX MAP 3 1E 12D
PORTION OF TAX LOTS
1700 AND 1790

N

SCALE 1" = 250 FEET

250 0 250

DATE: 03/20/2017

TAX MAP (MAP 3 1E 12D) WHEELER FARMS NATURAL RESOURCE ASSESSMENT	FIGURE 2B
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD SUITE 100 TUALATIN, OR 97062 www.aks-eng.com PHONE: 503.563.6151 FAX: 503.563.6152	DRWN: KMK CHKD: SAR AKS JOB: 5621

DWG: 5621 REPORT FIGURES | FIGURE 2B

MAP UNIT SYMBOL	MAP UNIT NAME
8B	BORNSTEDT SILT LOAM, 0% – 8% SLOPES; NON-HYDRIC
46B	JORY STONY SILT LOAM, 3% – 8% SLOPES; NON-HYDRIC
92F	XEROCHREPTS AND HAPLOXEROLLS, VERY STEEP; NON-HYDRIC

NRCS WEB SOIL SURVEY FOR
CLACKAMAS COUNTY

N

SCALE: 1"= 250 FEET

250 0 100 150 200 250

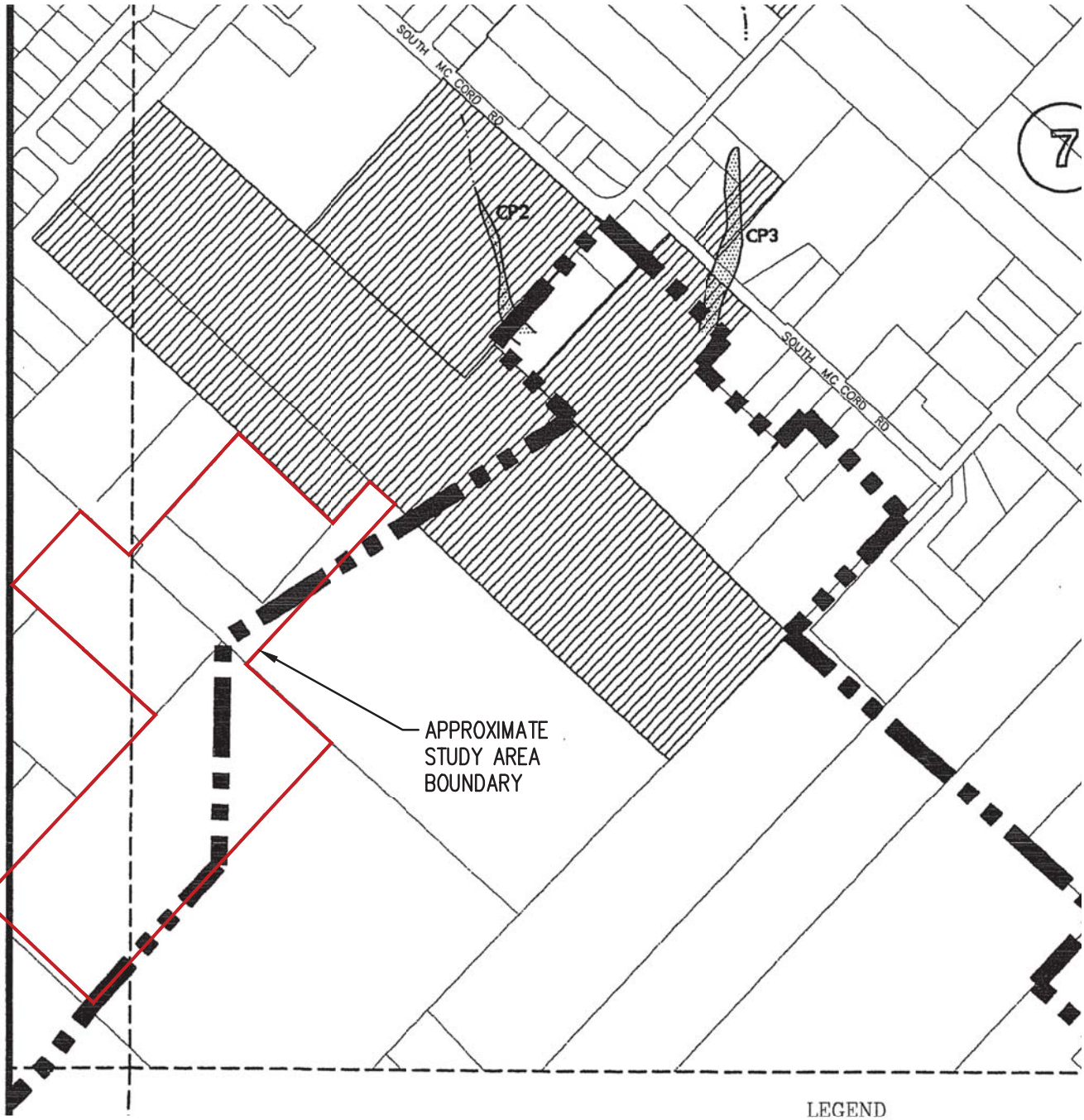
DATE: 03/20/2017

SOIL SURVEY MAP
WHEELER FARMS NATURAL RESOURCE ASSESSMENT

FIGURE 3

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD SUITE 100
TUALATIN, OR 97062 www.aks-eng.com
PHONE: 503.563.6151 FAX: 503.563.6152

DRWN: KMK
CHKD: SAR
AKS JOB: 5621



OREGON CITY LOCAL WETLAND INVENTORY, 1999
PAGE 7

NOTE: OLD UGB LINE FROM 1999

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- Sample site
- DSL DET wetland
- DSL DET 31-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream

N

SCALE: 1"= 500 FEET

500 0 200 300 400 500

DATE: 03/20/2017

LOCAL WETLAND INVENTORY MAP (LWI)
WHEELER FARMS NATURAL RESOURCE ASSESSMENT

FIGURE **4A**

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD SUITE 100
TUALATIN, OR 97062 www.aks-eng.com
PHONE: 503.563.6151 FAX: 503.563.6152

DRWN: KMK
CHKD: SAR
AKS JOB: 5621

OREGON CITY LOCAL WETLAND
INVENTORY, 1999
PAGE 12

LEGEND

- Urban Growth Boundary
- Wetland
- AC2 Wetland label
- FCR1 Riparian label
- .46 Sample site
- DSL DET wetland
- DSL DET 97-0569 DSL label
- Mitigation wetland
- Site access not granted
- Stream

NOTE: OLD UGB LINE FROM 1999

STUDY AREA EXTENDS OFF MAP
(SEE FIGURE 4A)

APPROXIMATE
STUDY AREA
BOUNDARY

N

SCALE: 1"= 500 FEET

500 0 200 300 400 500

DATE: 03/20/2017

LOCAL WETLAND INVENTORY MAP (LWI)
WHEELER FARMS NATURAL RESOURCE ASSESSMENT

FIGURE
4B

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD SUITE 100
TUALATIN, OR 97062 www.aks-eng.com
PHONE: 503.563.6151 FAX: 503.563.6152

DRWN: KMK
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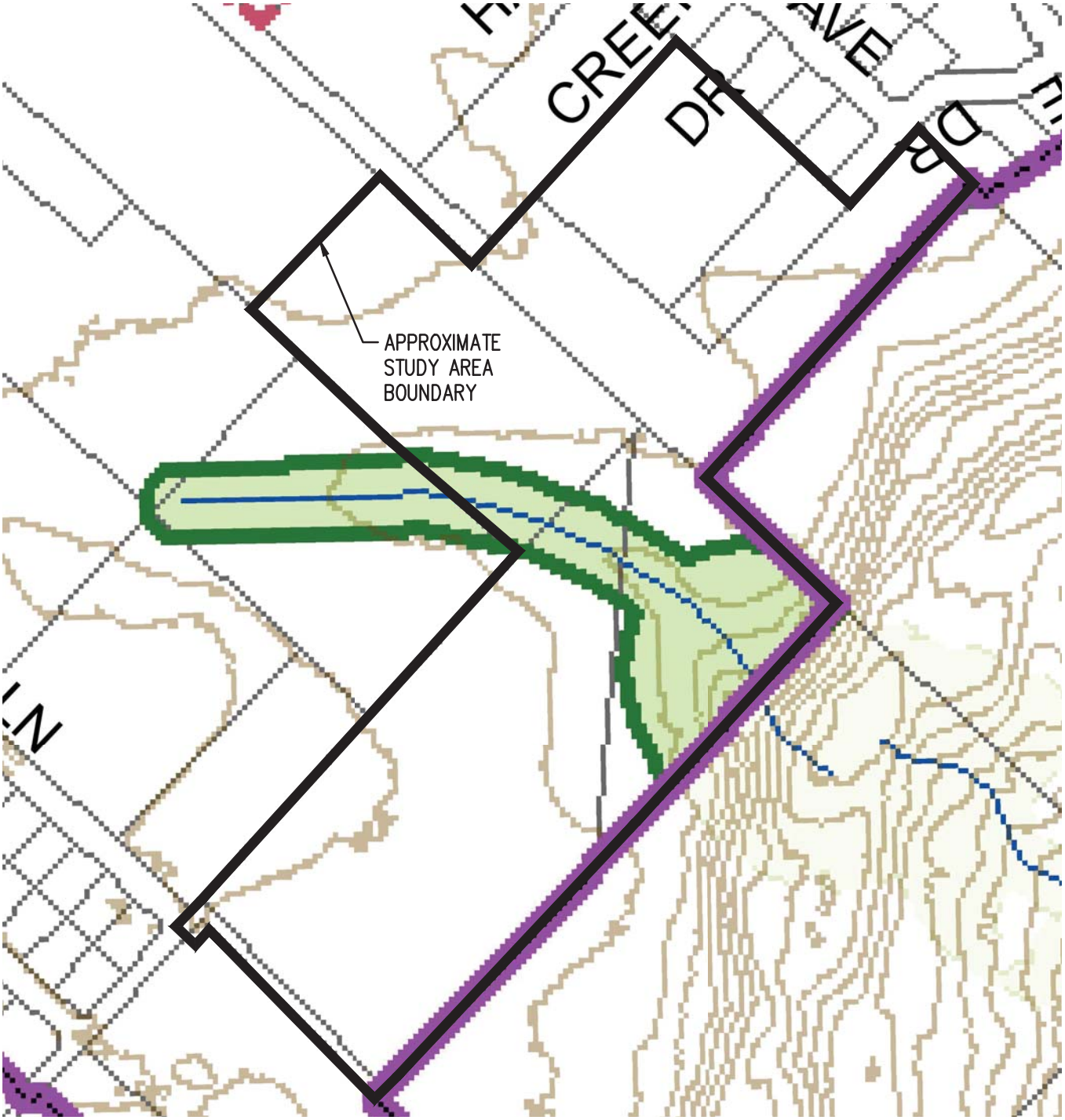
AKS JOB: 5621



OREGON CITY GIS NROD MAP

UGB
City Limits
Contours - 10 ft
Streams - piped
Perrenial Streams
Intermittent Streams
NROD Boundary
Taxlots
NROD Boundary (2009 Title13)
RIV_FILL

N

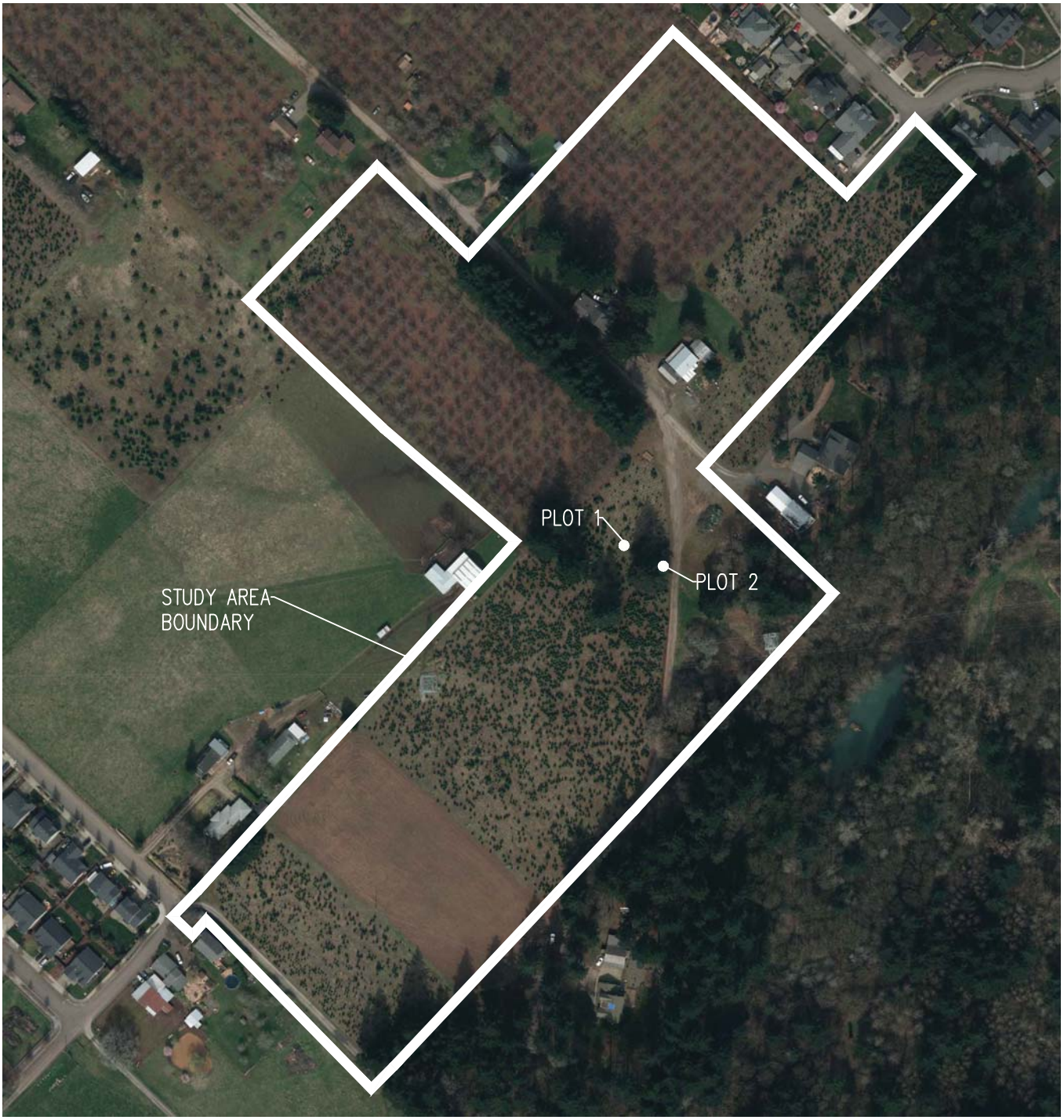
SCALE: 1"= 250 FEET

250 0 100 150 200 250

DATE: 03/20/2017

OREGON CITY GIS NROD MAP WHEELER FARMS NATURAL RESOURCE ASSESSMENT	FIGURE 5
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD SUITE 100 TUALATIN, OR 97062 www.aks-eng.com PHONE: 503.563.6151 FAX: 503.563.6152	DRWN: KMK CHKD: SAR AKS JOB: 5621

DWG: 5621 REPORT FIGURES | FIGURE 5



PLOT LOCATIONS SHOWN WERE DETERMINED BY AKS ENGINEERING & FORESTRY, LLC ON 3/15/2017. PLOT LOCATIONS ARE APPROXIMATE BASED ON FIELD OBSERVATIONS.

N

SCALE: 1"= 250 FEET

250 0 100 150 200 250

DATE: 03/20/2017

FIGURE 6

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD SUITE 100
TUALATIN, OR 97062 www.aks-eng.com
PHONE: 503.563.6151 FAX: 503.563.6152

DRWN: KMK
CHKD: SAR
AKS JOB: 5621

OREGON CITY

Community Development – Planning

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

TYPE I NATURAL RESOURCE OVERLAY DISTRICT VERIFICATION
May 19, 2017

FILE NUMBER:	NR 17-03: Type I Natural Resource Overlay District Verification
APPLICANT:	Rian Park Development, Inc. P.O. Box 2559 Oregon City, OR 97045
OWNERS:	32E07C Tax Lot 1001 (Wheeler Family Enterprises, LLC) 32E07C Tax Lots 1100, 1180 (David H. Wheeler Sr. Trust) 32E07C Tax Lot 1291 (Donald W. & Roxanne O. Wheeler) 31E12D Tax Lots 1700, 1790 (Wheeler Family Enterprises, LLC)
CONSULTANT:	AKS Engineering & Forestry, LLC 12965 SW Herman Road, Suite 100 Tualatin, OR 97062
REQUEST:	The applicant submitted a request for a Type I Natural Resource Overlay District Verification with a professionally prepared assessment to demonstrate that the subject site is not within the Natural Resource Overlay District.
LOCATION:	NO SITUS ADDRESS: Clackamas County Tax Map: 32E07C, Tax Lots: 1001, 1180, & 1291 / 31E12D, Tax Lots: 1700 & 1790; and 19566 Central Point Rd, Oregon City, OR 97045, Clackamas County Tax Map: 32E07C, Tax Lot 1100
ZONING:	"R-10", Single Family Residential District
DECISION:	Approval
REVIEWER:	Pete Walter, AICP, Planner
CRITERIA:	OCMC Chapter 17.49 – Natural Resource Overlay District OCMC Chapter 17.50 – Administration and Procedures

Type I decisions do not require interpretation or the exercise of policy or legal judgment in evaluating approval criteria and include lot line adjustments, zone changes upon annexation as provided in Section 17.06.050 for which there is no discretion provided, final plats, and final planned unit development plans where there are no material deviations from the approved preliminary plans. Because no discretion is involved, Type I decisions do not qualify as a land use, or limited land use, decision. The decision-making process requires no notice to any party other than the applicant. One representative from each of the city-recognized neighborhood associations, who has been identified by the neighborhood coordinator, will be distributed a monthly compilation of all Type I activities. The Community Development Director's decision is final and not appealable by any party through the normal city land use process. IF YOU HAVE ANY QUESTIONS ABOUT THIS APPLICATION, PLEASE CONTACT THE PLANNING DIVISION OFFICE AT (503) 722.3789.

I. BACKGROUND

The subject properties are located southeast of Central Point Road on the southern boundary of the City. The area was historically pastureland, Christmas trees and orchard land that was brought into the Metro Urban Growth Boundary in 2001 or earlier in 1979. The lands in question were annexed to Oregon City in 2006 (File AN 16-02) and have a zoning designation of R-10 Single Family Residential. There has been a lot of recent subdivision and home construction in the area over the last 10 years abutting the site to the northwest, and it is anticipated that this land will be used in the same manner.

As shown in Figure 1, the subject site is partially located within the mapped Natural Resource Overlay District (NROD), and is thus subject to review by the City of Oregon City to ensure adequate protection of nearby water features and associated vegetated corridors.

The Oregon City Municipal Code protects degradation of water features enforcing a vegetated corridor consisting of native plantings adjacent to the identified feature (e.g. stream or wetland) to improve water quality and functions. The applicant has requested an exemption from the Natural Resource Overlay District. Approval of this verification application would exempt the property from further NROD review pursuant with Chapter 17.49 of the Oregon City Municipal Code.

Figure 1: Subject Site and Mapped NROD

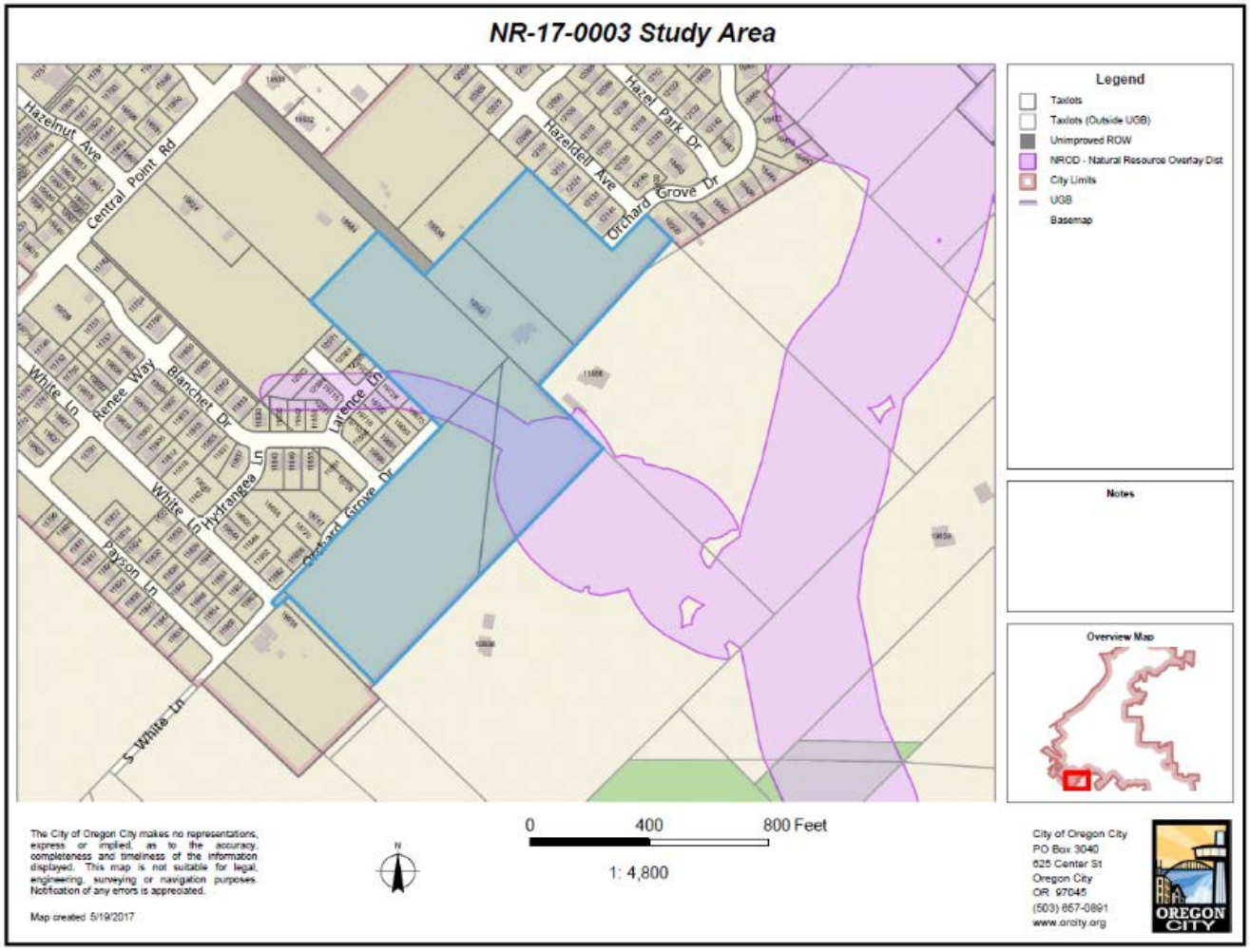
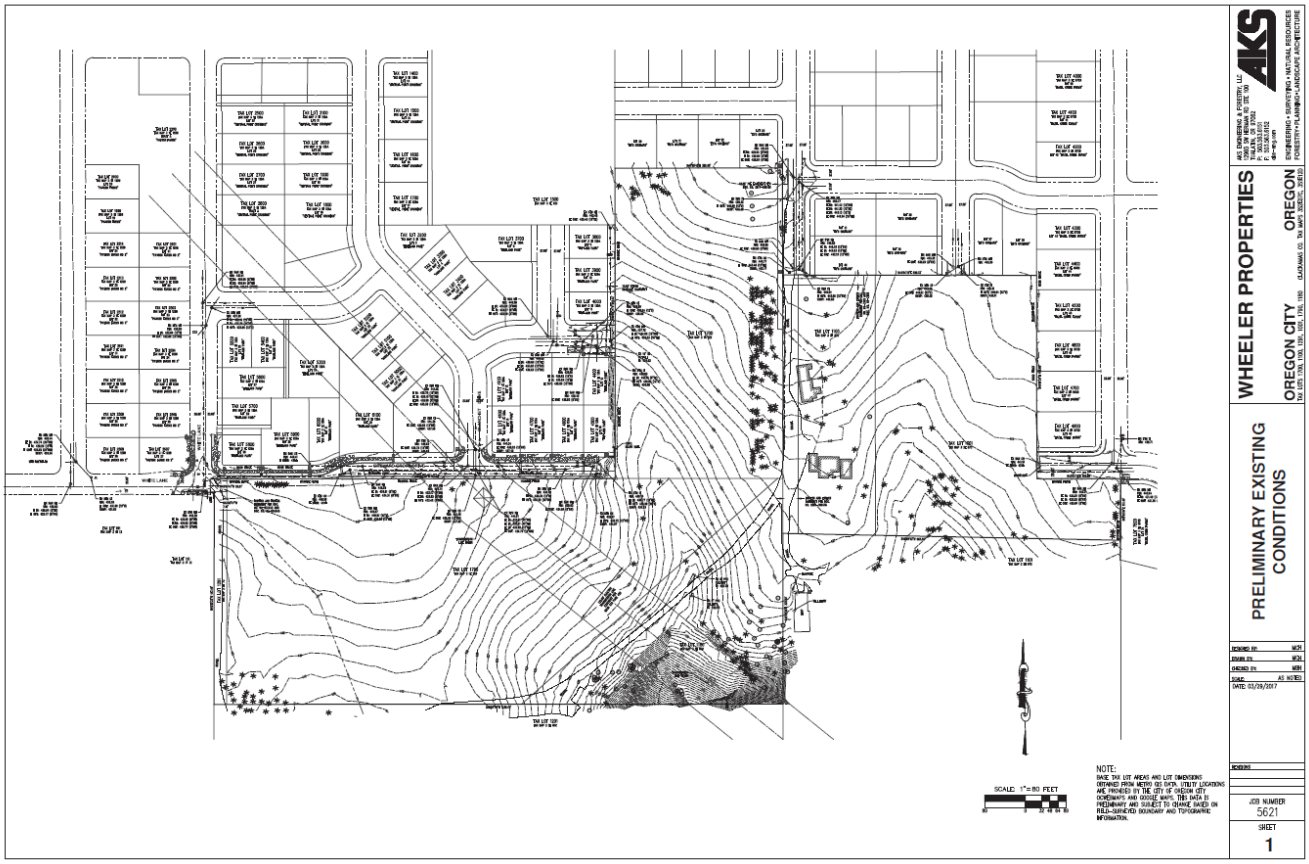


Figure 2: Existing Conditions Map from Applicant's Natural Resources Assessment



II. ANALYSIS AND FINDINGS

CHAPTER 17.49 NATURAL RESOURCE OVERLAY DISTRICT

17.49.250 Verification of NROD Boundary

The NROD boundary may have to be verified occasionally to determine the true location of a resource and its functional values on a site. This may through a site specific environmental survey or, in those cases where existing information demonstrates that the NROD significance rating does not apply to a site-specific area. Applications for development on a site located in the NROD area may request a determination that the subject site is not in an NROD area and therefore is not subject to the standards of Section 17.49.100. Verifications shall be processed as either a Type I or Type II process.

Finding: Applicable. The City of Oregon City's maps show a perennial stream that originates off-site to the west and flows into the center of the subject site. A Natural Resource Assessment dated April 3, 2017 has been prepared concluding that no potentially jurisdictional Title 3 wetlands or waters, or associated vegetated corridors were documented on-site and that the stream identified in the City's mapping is not present on the subject property. No development is associated with this application and it has been determined that a Type I NROD Verification application can accomplish the requested concurrence that the subject property is not in an NROD area.

17.49.255 - Type I verification.

A. Applicants for a determination under this section shall submit a site plan meeting the requirements of Section 17.49.220, as applicable.

Finding: Complies as Proposed. The applicant submitted a Natural Resource Assessment prepared by Lindsey Obermiller, Natural Resource Specialist, including site plans in accordance with Section 17.49.220, as applicable. The Natural Resource Assessment included in the application materials includes site plans and conclusions that no evidence of the characteristics found in criteria B.1. – B.6. exist on the subject site.

B. Alternatively, an applicant may request a Type I Verification determination by the community development director by making an application therefore and paying to the city a fee as set by resolution of the city commission. Such requests may be approved provided that there is evidence substantiating that all the requirements of this chapter relative to the proposed use are satisfied and demonstrates that the property also satisfies the following criteria, as applicable:
1. No soil, vegetation, hydrologic features have been disturbed;
2. No hydrologic features have been changed;
Finding: Complies as proposed. The applicant has not requested that the Community Development Director make this determination. The Natural Resources Assessment and Wetland Determination Data Forms submitted by the applicant provides the necessary evidence that the criteria for exemption are met.

3 There are no man-made drainage features, water marks, swash lines, drift lines present on trees or shrubs, sediment deposits on plants, or any other evidence of sustained inundation.
Finding: Complies as Proposed. The Natural Resources Assessment and Wetland Determination Data Forms submitted by the applicant identify that the site did not have any observable water marks, swash lines, drift lines on trees or shrubs, sediment deposits on plants, or any other evidence of sustained inundation in the vicinity of the steel building onsite.

4. The property does not contain a wetland as identified by the city's local wetland inventory or water quality and flood management areas map.
Finding: Complies as Proposed. The City's local wetland inventory and NROD map do not identify a wetland at the property. The Natural Resources Assessment and Wetland Delineation Data Forms submitted by the applicant also conclude that the site and adjacent locations do not possess any jurisdictional Title 3 wetlands or waters, or associated vegetated corridors.

5. There is no evidence of a perennial or intermittent stream system or other protected water feature. This does not include established irrigation ditches currently under active farm use, canals or manmade storm or surface water runoff structures or artificial water collection devices.
Finding: Complies as Proposed. The Natural Resources Assessment and Wetland Determination Data Forms submitted by the applicant identify that the site did not contain evidence of perennial or intermittent stream or other protected water features.

6. Evidence of prior land use approvals that conform to the City's existing Water Quality Resource Area Overlay District.
There is an existing physical barrier between the site and a protected water feature, including:
a. Streets, driveways, alleys, parking lots or other approved impervious areas wider than fifteen feet and which includes drainage improvements that are connected to the city storm sewer system, as approved by the city.
b. Walls, buildings, drainages, culverts or other structures and which form a physical barrier between the site and the protected water features, as approved by the city.
Finding: Complies as proposed. The Highland Park subdivision uphill and abutting the property received land use approval which included a prior NROD exemption regarding the subject mapped resource (Planning File TP 15-01, NR 14-08).

C. If a the city is not able to clearly determine, through the Type I verification process that the applicable criteria subsection B.1.—B.6. above are met the verification application shall be denied. An applicant may then opt to apply for a verification through the Type II process defined below.
Finding: Not Applicable. The applicant's submittal adequately demonstrates that a protected feature and associated vegetated buffer are not present onsite, and that the criteria in subsections B.1-B.6 are met. A Type II verification is not required.

17.49.260. Type II Verification
Finding: Not Applicable. The application does not include a Type II Verification request.

17.49.265 - Corrections to violations.
For correcting violations, the violator shall submit a remediation plan that meets all of the applicable standards of the NROD. The remediation plan shall be prepared by one or more qualified professionals with experience and credentials in natural resource areas, including wildlife biology, ecology, hydrology and forestry. If one or more of these standards cannot be met then the applicant's remediation plan shall demonstrate that there will be:
A. No permanent loss of any type of resource or functional value listed in Section 17.49.10, as determined by a qualified environmental professional;
B. A significant improvement of at least one functional value listed in section 17.49.10, as determined by a qualified environmental professional; and
C. There will be minimal loss of resources and functional values during the remediation action until it is fully established.
Finding: Not Applicable. No violations have been reported. Therefore, a remediation plan for the violation is not required.

CHAPTER 17.50 - ADMINISTRATION AND PROCEDURES
17.50.030 Summary of the City's Decision-Making Processes.
Finding: Complies as Proposed. The Natural Resource Overlay District verification application is being reviewed pursuant to the Type I process.

III. CONCLUSION AND DECISION

Based on the analysis and findings presented in this report, and the substantial evidence in the application materials, the properties identified are exempt from further review under Chapter 17.49 of the Oregon City Municipal Code. Though the site is exempt from further NROD review, portions of the property also fall within the Geologic Hazards Overlay District and development is subject to compliance with OCMC Chapter 17.44, *Geologic Hazards* at the time of land division application.

EXHIBITS

1. Vicinity Map (On File)
2. Map of the Site and Natural Resources Overlay District (On File)
2. Applicant's Submittal (On File)

Attachment A: Wetland Determination Data Sheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: 5621: Wheeler Farms City/County: Oregon City/ Clackamas Sampling Date: 3/15/2017

Applicant/Owner: Rian Park Development State: OR Sampling Point: 1

Investigator(s): Kayla Katkin and Lindsey Obermiller Section, Township, Range: 3 1E 12D

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): <3%

Subregion (LRR): A, Northwest Forests and Coast Lat: Long: Datum:

Soil Map Unit Name: Jory Stony Silt Loam, 3%-8% Slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)

Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ,Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	
Hydric Soil Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes No X
Wetland Hydrology Present?	Yes	No X	

Precipitation: According to the AgACIS Oregon City station, 1.30 inches of rainfall was received on the day of the site visit and 4.32 inches within the two weeks prior. Rainfall conditions received prior to site visit were above normal.

Remarks: Plot taken at low spot in tree farm area in the vicinity of the NROD mapped stream.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Pseudotsuga menziesii*	40%	Yes	FACU
2. *Rubus armeniacus*	10%	Yes	FAC
3.			
4.			
5.			
	50% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Agrostis capillaris*	75%	Yes	FAC
2. *Daucus carota*	10%	No	FACU
3. *Hypochaeris radicata*	10%	No	FACU
4. *Plantago lanceolata*	2%	No	FACU
5. *Holcus lanatus*	2%	No	FAC
6. *Geranium molle*	2%	No	NOL
7.			
8.			
9.			
10.			
11.			
	101% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	87	x 3 =	261
FACU species	62	x 4 =	248
UPL species	2	x 5 =	10
Column Totals:	151 (A)		519 (B)

Prevalence Index = B/A = 3.44

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No

Remarks: Shrub layer *Pseudotsuga menziesii are planted for Christmas tree farm.*

SOIL

Sampling Point: **1**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16+	10YR 3/4	100					SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >16"	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >16"	**Yes** ___	**No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: 5621: Wheeler Farms City/County: Oregon City/ Clackamas Sampling Date: 3/15/2017

Applicant/Owner: Rian Park Development State: OR Sampling Point: 2

Investigator(s): Kayla Katkin and Lindsey Obermiller Section, Township, Range: 3 1E 12D

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): <3%

Subregion (LRR): A, Northwest Forests and Coast Lat: Long: Datum:

Soil Map Unit Name: Jory Stony Silt Loam, 3%-8% Slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)

Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ,Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No	X
Hydric Soil Present?	Yes	No	X
Wetland Hydrology Present?	Yes	No	X

Is the Sampled Area within a Wetland? Yes No X

Precipitation: According to the AgACIS Oregon City station, 1.30 inches of rainfall was received on the day of the site visit and 4.32 inches within the two weeks prior. Rainfall conditions received prior to site visit were above normal.

Remarks: Plot taken in low area, just outside of tree farm area in vicinty of NROD mapped stream. Approxiamtely 6" lower in elevation than Plot 1.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pseudotsuga menziesii*	25%	Yes	FACU
2.			
3.			
4.			
	25% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Pseudotsuga menziesii*	30%	Yes	FACU
2. *Rubus armeniacus*	5%	No	FAC
3.			
4.			
5.			
	35% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Agrostis capillaris*	70%	Yes	FAC
2. *Daucus carota*	10%	No	FACU
3. *Hypochaeris radicata*	10%	No	FACU
4. *Holcus lanatus*	5%	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	95% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 5%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	130 (A)		440 (B)

Prevalence Index = B/A = 3.38

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes No X

Remarks: Shrub layer *Pseudotsuga menziesii* are planted for Christmas tree farm.

SOIL

Sampling Point: **2**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	100					SiL	
6-14	10YR 3/3	98	7.5YR 4/4	2	C	M, PL	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >14"

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >14"

Wetland Hydrology Present? Yes _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Attachment B: Representative Site Photographs

Photo A. View south of Plot 2. Plot 2 is located just outside of the densely planted Christmas tree farm at the lowest point within the mapped NROD area.

Photo B. View facing north within Christmas tree farm.

Photo C. View south of driveway that extends through mapped NROD area.

Photo D. View north of Plot 1. Plot 1 is located within the Christmas tree farm in the vicinity of the mapped NROD area.

Photos taken by Kayla Katkin, March 15, 2017

Exhibit K: Preliminary Stormwater Report

Wheeler Farms
Oregon City, Oregon

Preliminary Stormwater Report

Date:	June 2017
Client:	Rian Park Development, Inc.
Engineering Contact:	Monty Hurley, PE, PLS
Engineering Firm:	AKS Engineering & Forestry, LLC
AKS Job No.:	5621

RENEWAL DATE: 6/30/17

AKS ENGINEERING & FORESTRY

12965 SW Herman Road, Suite 100
Tualatin, OR 97062
P: (503) 563-6151
www.aks-eng.com

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APPENDIX 4-1 BMP SIZING TOOL REPORT

APPENDIX 5-1 STORMWATER FACILITIES LOCATION AND DETAIL

APPENDIX 6-1 EMERGENCY OVERFLOW CALCULATIONS

APPENDIX 7-1 SOIL INFORMATION

APPENDIX 8-1 RELEVANT INFORMATION

APPENDIX 9-1 UPSTREAM TRIBUTARY DRAINAGE MAP

Preliminary Stormwater Report
WHEELER FARMS SUBDIVISION
OREGON CITY, OREGON

1.0 Purpose of Report
The purpose of this report is to document the stormwater analysis for the subject site, the sources of information upon which the analysis was based, the design methodology, and the results of the analysis.

2.0 Project Location/Description
The proposed development comprises approximately 22.56± acres in the City of Oregon City, Clackamas County, Oregon. The development will encompass Tax Lots 1001, 1100, 1180, and 1291 of Clackamas County Assessor's Map 3 2E 07C and Tax Lots 1700 and 1790 of Clackamas County Assessor's Map 3 1E 12D.

3.0 Regulatory Design Criteria
3.1 STORMWATER QUANTITY MANAGEMENT CRITERIA
The stormwater quantity management criteria required by the Oregon City Public Works Stormwater and Grading Design Standards (February 2015) are summarized below:

> *Flow control facilities shall be designed so that the duration of peak flow rates from post-development conditions shall be less than or equal to the duration of peak flow rates from pre-development conditions for all peak flows between 42 percent of the 2-year peak flow rate up to the 10-year peak flow rate. […] The BMP Sizing Tool addresses these flow control requirements to size stormwater management facilities.*

The BMP Sizing Tool was utilized to size stormwater quantity management facilities for this project.

3.2 STORMWATER QUALITY MANAGEMENT CRITERIA
The stormwater quality management criteria required by the Oregon City Public Works Stormwater and Grading Design Standards (February 2015) are summarized below:

> *Water quality facilities shall be designed to capture and treat 80 percent of the average annual runoff volume to the MEP [maximum extent practicable] with the goal of 70 percent total suspended solids removal. The treatment volume equates to a water quality design storm of 1.0 inch over 24 hours. The BMP Sizing Tool addresses these water quality requirements to size stormwater management facilities.*

The BMP Sizing Tool was utilized to size stormwater quality management facilities for this project.

3.3 FLOODPLAIN
There are no floodplains present on the subject site according to the Flood Insurance Rate Map (FIRM) produced by the Federal Emergency Management Agency (FEMA).

3.4 REQUIRED PERMITS
No permits are required for this project from the Oregon Department of State Lands (DSL) or the U.S. Army Corps of Engineers (USACE).

4.0 Infiltration Test Result

Per the Geotechnical Engineering Report prepared by GeoPacific Engineering, Inc. and dated June 16, 2017 open pit falling-head infiltration testing conducted on the planned stormwater facility (detention pond) location demonstrated a minimum measured infiltration rate of 0.06 inches per hour at a depth of 12.0 feet. The detention pond is planned to be installed at a depth of at least 12.0 feet. Therefore, an infiltration rate of 0.03 inches per hour will be utilized for the design (a safety factor of 2 is applied to the tested rate).

There were several other open pit falling-head infiltration testing conducted on the planned filtration vegetated swale locations and the average (not including the test results considered too high for materials observed) infiltration rate was 0.20 inches per hour. Therefore, an infiltration rate of 0.10 inches per hour was utilized for the design of the filtration vegetated swales (a safety factor of 2 is applied to the tested rate).

5.0 Sources of Information and Design Methodology

The Santa Barbara Urban Hydrograph (SBUH) Method was utilized for the stormwater conveyance system analysis of the subject site. This method utilizes the SCS Type 1A 24-hour storm. HydroCAD software aided in the analysis. The BMP Sizing Tool was utilized to size the stormwater management facilities.

6.0 Design Parameters

6.1 DESIGN STORM

6.1.1 Stormwater Management Facilities Design

The flow results contained in the BMP sizing report were utilized for the stormwater management facilities sizing and analysis.

6.1.2 Inlet and Conduit Sizing

The stormwater inlets (curb inlet catch basins) for the site will be placed according to the grading (at all low points in grade and other necessary locations) and adequately manage the stormwater for the site. The distance between curb inlet catch basins will generally be 400 feet or less.

The stormwater pipes will be sized using the SBUH method to adequately convey the 10-year (3.5-inch) storm event (gravity flow).

6.2 PRE-DEVELOPED SITE TOPOGRAPHY AND LAND USE

6.2.1 Site Topography

The site slopes toward southeast corner of the project, with slopes ranging from 1% to 25%.

6.2.2 Land Use

There is an existing single-family home on the site, as well as outbuildings, orchards, fields, and trees.

6.2.3 Pre-Developed Input Parameters

The input parameters for each subcatchment (basin) are shown in the appendices.

6.3 SOIL TYPE

The soils on this site consist of Bornstedt silt loam, Jory stony silt loam, Xerochrepts and Haploxerolls. Per the U.S. Department of Agriculture (USDA) Soil Survey for Clackamas County, these soil types belong to hydrologic soil group "C" and "B". Applicable soil information is provided in Appendix 7-1.

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 and lots for the future construction of single-family detached homes. There are no substantial terrain alterations planned.

6.4.2 Land Use

The post-developed land use will consist of 77 lots conforming to R-8 zoning standards for detached single-family homes, as well as one tract for a stormwater facility, one tract for open space, and seven public streets.

6.4.3 Future Development

The project's stormwater facility is sized to provide stormwater quality and quantity for a future seven (7) lot development on the remainder of Tax Lot 1790 of Clackamas County Assessor's Map 3 1E 12D.

6.4.4 Post-Developed Input Parameters

Input parameters for each subcatchment (basin) and pond are shown in the appendices. The calculation method used to determine impervious area for the site post-development included measuring all impervious area within the new rights-of-way (streets, curbs, sidewalks, and driveway approaches) and adding 2,640 square feet of impervious area per lot (total of 84 lots).

6.5 DESCRIPTION OF OFF-SITE CONTRIBUTORY BASINS

There is an existing stormwater pipe that was installed with Highland Park subdivision (at the end of Larence Lane) to provide a stormwater connection point for future development on Tax Lots 1500 and 1501 (approximately 6.5 acres) of Clackamas County Assessor's Map 3 1E 12D. This existing pipe will connect to the stormwater conveyance system for this project.

7.0 Calculation Methodology

7.1 PROPOSED STORMWATER CONDUIT SIZING AND INLET SPACING

The proposed stormwater pipes will be sized during final engineering using the SBUH method to adequately convey the 10-year storm event (gravity flow). Inlets will be placed at all low points and will generally be spaced at 400 feet or less.

7.2 PROPOSED STORMWATER QUANTITY CONTROL (DETENTION) FACILITY DESIGN

The detention pond was sized with the BMP Sizing Tool to provide flow control for the stormwater runoff from impervious area within the new rights-of-way and lots. Stormwater quantity facility design parameters were determined from topographic survey information, aerial photographs, contours, design, and analysis. The detention pond was designed to address the stormwater quantity (detention) requirements of the Oregon City Public Works Stormwater and Grading Design Standards (February 2015).

7.3 PROPOSED STORMWATER QUALITY CONTROL FACILITY DESIGN

The detention pond was sized with the BMP Sizing Tool to provide water quality management for the stormwater runoff from future impervious areas on the lots. Filtration vegetated swales between the curb and sidewalk of streets within the development were sized using the BMP Sizing Tool to provide water quality management for stormwater runoff from impervious area within the new street right-of-ways.

Stormwater quality facility design parameters were determined from topographic survey information, aerial photographs, contours, design, and analysis. The filtration vegetated swales were designed to address the stormwater quality requirements of the Oregon City Public Works Stormwater and Grading Design Standards (February 2015).

7.4 ENERGY DISSIPATER CALCULATIONS

Riprap will be placed at the inlet of the pond to act as an energy dissipater. The riprap size will be a minimum of Class 50.

7.5 DOWNSTREAM ANALYSIS

The subject site is designated in the City's Drainage Master Plan to be located in the Beaver Basin.

The stormwater facility provides water quality and water quantity for the project. Peak flow will be detained and metered out at or below the existing downstream system capacity. The area of the project site is approximately 6.5% of the upstream tributary drainage area. Therefore, this project does not significantly impact downstream drainage capacity.

7.6 CULVERT ANALYSIS

No culverts are proposed with this project.

8.0 BMP Sizing Tool Summary

The stormwater from the site will be routed through a series of filtration vegetated swales, curb inlets, pipes, and manholes prior to reaching the stormwater facility in Tract B. There will be two main inlets and one outlet in the pond. The pond bottom (at the bottom of drain rock layer) will be at an elevation of 424.50 feet and the top of the pond will be at an elevation 431.00 feet. The pond outlet structure will have the following orifices per the BMP Sizing Tool model:

Table 8-1: Pond Outlet Structure Parameters

Pond Outlet	Size	Type	Invert Elevation
Orifice A	3.4" diameter	Round orifice	424.50
Orifice B	12.6" diameter	Round orifice	428.00
Riser C	24.0" diameter	Round orifice	429.75

Filtration vegetated swales will address the water quality treatment requirements for all impervious area within the new rights-of-way (streets, curbs, sidewalks, and driveway approaches). Per the BMP Sizing Tool report, 5,764 square feet of filtration vegetated swale is required. The planned total area of filtration vegetated swale within the new rights-of-way will exceed the required 5,764 square feet.

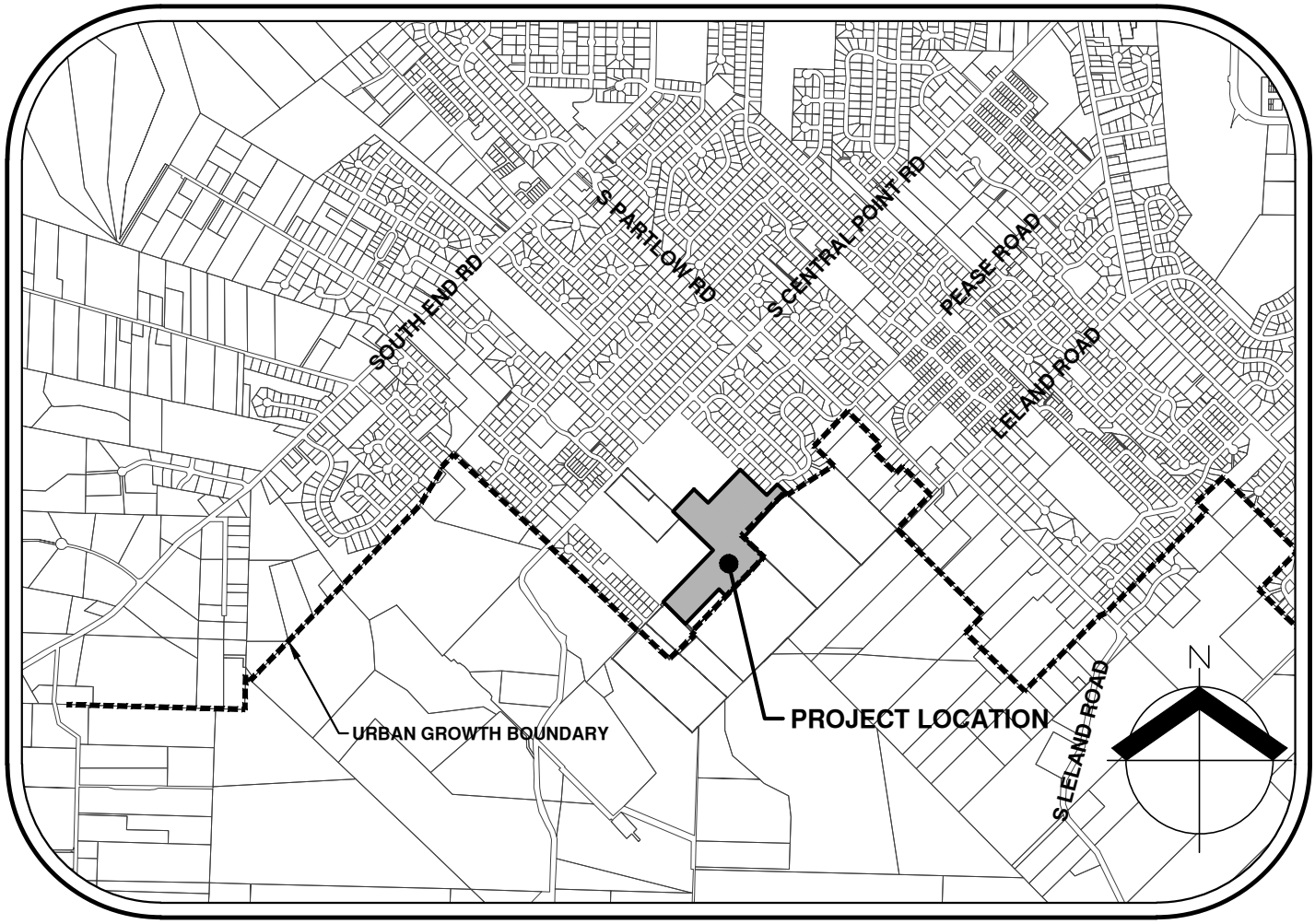
The project will adhere to the grading and compaction guidelines of the Oregon City Public Works Stormwater and Grading Design Standards (February 2015) to the maximum extent possible.

9.0 Stormwater Detention Pond Safeguards

Calculations for the 100-year storm event are included in the appendices. The stormwater pond is designed to adequately handle this storm event. If the outlet structure becomes plugged, or for some other reason cannot convey the stormwater, the stormwater will overflow through the emergency overflow (maintenance access driveway) and to the downstream conveyance system. The emergency overflows were sized to accommodate flows from the 100-year storm (assuming the outlet structure is plugged). There are no foreseen problems with this method.

APPENDIX 1-1

VICINITY MAP



VICINITY MAP

NOT TO SCALE

APPENDIX 2-1

PRE-DEVELOPED BASIN MAP

SCALE: 1"=60 FEET
60 0 24 36 48 60
ON 34" X 24" PAPER

HAZEL CREEK DRIVE
TOLSTRUP DRIVE
HAZELDELL DRIVE
HYDRANGEA LANE
BLANCHET DRIVE
HAZELNUT AVENUE
LARENCE LANE
WHITE LANE
ORCHARD GROVE DRIVE

TAX LOT 1500
TAX MAP 3 1E 12D

TAX LOT 1700
TAX MAP 3 1E 12D

TAX LOT 1100
TAX MAP 3 2E 07C

TAX LOT 1001
TAX MAP 3 2E 07C

TAX LOT 1101
TAX MAP 3 2E 07C

TAX LOT 1180
TAX MAP 3 2E 07C

TAX LOT 1790
TAX MAP 3 1E 12D
DOCUMENT NUMBER
2013-070117

TAX LOT 1201

TAX LOT 1291
TAX MAP 3 2E 7C

TAX LOT 3800
TAX MAP 3 1E 12DA
LOT 9
"HIGHLAND PARK"

TAX LOT 3900
TAX MAP 3 1E 12DA
LOT 10
"HIGHLAND PARK"

TAX LOT 4000
TAX MAP 3 1E 12DA
LOT 11
"HIGHLAND PARK"

TAX LOT 4400
TAX MAP 3 1E 12DA
LOT 15
"HIGHLAND PARK"

TAX LOT 4600
TAX MAP 3 1E 12DA
LOT 17
"HIGHLAND PARK"

TAX LOT 4700
TAX MAP 3 1E 12DA
LOT 18
"HIGHLAND PARK"

TAX LOT 4800
TAX MAP 3 1E 12DA
LOT 19
"HIGHLAND PARK"

TAX LOT 4500
TAX MAP 3 1E 12DA
LOT 16
"HIGHLAND PARK"

TAX LOT 5500
TAX MAP 3 1E 12DA
LOT 26
"HIGHLAND PARK"

TAX LOT 5400
TAX MAP 3 1E 12DA
LOT 25
"HIGHLAND PARK"

TAX LOT 5300
TAX MAP 3 1E 12DA
LOT 24
"HIGHLAND PARK"

TAX LOT 5600
TAX MAP 3 1E 12DA
LOT 27
"HIGHLAND PARK"

TAX LOT 5700
TAX MAP 3 1E 12DA
LOT 28
"HIGHLAND PARK"

TAX LOT 5800
TAX MAP 3 1E 12DA
LOT 29
"HIGHLAND PARK"

TAX LOT 5900
TAX MAP 3 1E 12DA
LOT 30
"HIGHLAND PARK"

TAX LOT 6000
TAX MAP 3 1E 12DA
LOT 31
"HIGHLAND PARK"

TAX LOT 6100
TAX MAP 3 1E 12DA
LOT 32
"HIGHLAND PARK"

TAX LOT 4300
TAX MAP 3 2E 07CB
LOT 43 "HAZEL CREEK FARMS"

TAX LOT 4400
TAX MAP 3 2E 07CB
LOT 44
"HAZEL CREEK FARMS"

TAX LOT 4500
TAX MAP 3 2E 07CB
LOT 45
"HAZEL CREEK FARMS"

TAX LOT 4600
TAX MAP 3 2E 07CB
LOT 46
"HAZEL CREEK FARMS"

TAX LOT 4700
TAX MAP 3 2E 07CB
LOT 47
"HAZEL CREEK FARMS"

TAX LOT 4800
TAX MAP 3 2E 07CB
LOT 48
"HAZEL CREEK FARMS"

LOT 20 "ED'S ORCHARD"
LOT 21 "ED'S ORCHARD"
LOT 22 "ED'S ORCHARD"
LOT 23 "ED'S ORCHARD"
LOT 38 "ED'S ORCHARD"
LOT 39 "ED'S ORCHARD"
LOT 40 "ED'S ORCHARD"
LOT 37 "ED'S ORCHARD"
LOT 36 "ED'S ORCHARD"

10.00' PGE EASEMENT PER DOC. NO. 2017-009109
15.00' STORM DRAINAGE EASEMENT
INGRESS AND EGRESS EASEMENT
INGRESS AND EGRESS EASEMENT PER DOC. NO. 94-034242 AND DOC. NO. 94-034243
125.00' ELECTRIC TRANSMISSION LINE EASEMENT PER BOOK 619 PAGE 452
TRANSMISSION LINE TOWER
REMAINDER OF TAX LOT 1790 TAX MAP 3 1E 12D DOC. NO. 2013-070117
STORM LATERAL BOARD
GRAVEL
SHED
SHOP
FLAGPOLE
EXTRUDED CURB

EX STM MH RIM: 450.77 IE IN: 441.43 (15"NW) IE IN: 441.33 (12"SE) IE IN: 443.13 (12"S) IE OUT: 441.24 (15"NE)
EX STM MH RIM: 446.82 IE IN: 442.43 (12"SW) IE IN: 442.63 (12"NE) IE OUT: 442.13 (12"NW)
EX STM CI RIM: 446.94 IE OUT: 443.95 (12"SW) SUMP: 442.50
EX STM CI RIM: 443.40 IE OUT: 440.81 (12"N) SUMP: 439.30
EX STM MH RIM: 443.35
EX STM CI RIM: 443.31 IE OUT: 440.84 (12"W) SUMP: 439.11
EX STM MH RIM: 443.48 IE OUT: 435.43 (16"SE)
EX STM MH RIM: 437.36 IE IN: 432.41 (12"SE) IE IN: 432.30 (12"NE) IE OUT: 432.06 (12"SW)
EX STM MH RIM: 440.03 IE IN: 435.63 (12"NE) IE IN: 435.60 (12"NW) IE OUT: 435.53 (12"SW)
EX STM MH RIM: 438.86 IE IN: 435.92 (12"N) IE IN: 435.83 (12"E) IE OUT: 435.83 (12"SW)
EX STM MH RIM: 444.15 IE IN: 435.70 (12"SW) IE IN: 436.10 (12"NE) IE IN: 435.50 (12"SE) IE OUT: 435.30 (12"NW)
EX STM CI RIM: 444.39 IE OUT: 438.09 (12"NE) SUMP: 437.99
EX STM CI RIM: 445.62 IE OUT: 439.72 (12"SE) SUMP: 445.62
EX STM MH RIM: 437.72 IE IN: 434.93 (16"NW) IE OUT: 434.83 (16"SE)
EX STM CI RIM: 438.59 IE OUT: 436.04 (12"S) SUMP: 438.59
EX STM CI RIM: 438.50 IE IN: 436.19 (6"SE) IE OUT: 436.03 (12"W) SUMP: 434.68
EX STM CI RIM: 444.34 IE OUT: 438.53 (12"SW) SUMP: 439.40
EX STM MH RIM: 439.70 IE IN: 436.35 (12"N) IE OUT: 436.26 (12"SW)
EX STM MH RIM: 444.81 IE IN: 435.81 (12"SW) IE IN: 435.81 (12"NE) IE IN: 435.96 (12"SE) IE OUT: 435.75 (12"NW)
EX STM CI RIM: 438.10 IE IN: 436.77 (12"SE) IE OUT: 436.60 (12"S) SUMP: 434.73
EX STM MH RIM: 448.87 IE IN: 440.07 (12"S) IE OUT: 439.93 (12"NE)
EX STM CO RIM: 448.96 IE BEND: 441±

12" PVC
12" DIP
8" PVC
10" PVC
16" PVC

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WHEELER FARMS

OREGON

OREGON CITY

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

PRE-DEVELOPED CATCHMENT (BASIN MAP)

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE: 06/19/2017	

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER
5621

SHEET
1

AKS DRAWING FILE: 5621 BASIN PRE.DWG | LAYOUT: PRE

APPENDIX 3-1

POST-DEVELOPED BASIN MAP

SCALE: 1"=60 FEET
60 0 24 36 48 60
ON 34" X 24" PAPER

HAZEL CREEK DRIVE
TOLSTRUP DRIVE
HAZELDELL AVENUE
HAZELNUT AVENUE
BLANCHET DRIVE
HYDRANGEA LANE
LARENCE LANE
WHITE LANE
WHEELER WAY
SKELLENGER WAY
WINNIE WAY
ORCHARD GROVE DRIVE
WHEELER FARM ROAD

TAX LOT 1500
TAX MAP 3 1E 12D

TAX LOT 3800
TAX MAP 3 1E 12DA
LOT 9
"HIGHLAND PARK"

TAX LOT 3900
TAX MAP 3 1E 12DA
LOT 10
"HIGHLAND PARK"

TAX LOT 4000
TAX MAP 3 1E 12DA
LOT 11
"HIGHLAND PARK"

TAX LOT 4300
TAX MAP 3 2E 07CB
LOT 43 "HAZEL CREEK FARMS"

TAX LOT 4400
TAX MAP 3 2E 07CB
LOT 44
"HAZEL CREEK FARMS"

TAX LOT 4500
TAX MAP 3 2E 07CB
LOT 45
"HAZEL CREEK FARMS"

TAX LOT 4600
TAX MAP 3 2E 07CB
LOT 46
"HAZEL CREEK FARMS"

TAX LOT 4700
TAX MAP 3 2E 07CB
LOT 47
"HAZEL CREEK FARMS"

TAX LOT 4800
TAX MAP 3 2E 07CB
LOT 48
"HAZEL CREEK FARMS"

TAX LOT 5500
TAX MAP 3 1E 12DA
LOT 26
"HIGHLAND PARK"

TAX LOT 5400
TAX MAP 3 1E 12DA
LOT 25
"HIGHLAND PARK"

TAX LOT 5300
TAX MAP 3 1E 12DA
LOT 24
"HIGHLAND PARK"

TAX LOT 5600
TAX MAP 3 1E 12DA
LOT 27
"HIGHLAND PARK"

TAX LOT 5700
TAX MAP 3 1E 12DA
LOT 28
"HIGHLAND PARK"

TAX LOT 5800
TAX MAP 3 1E 12DA
LOT 29
"HIGHLAND PARK"

TAX LOT 5900
TAX MAP 3 1E 12DA
LOT 30
"HIGHLAND PARK"

TAX LOT 6000
TAX MAP 3 1E 12DA
LOT 31
"HIGHLAND PARK"

TAX LOT 6100
TAX MAP 3 1E 12DA
LOT 32
"HIGHLAND PARK"

TAX LOT 4800
TAX MAP 3 1E 12DA
LOT 19
"HIGHLAND PARK"

TAX LOT 4700
TAX MAP 3 1E 12DA
LOT 18
"HIGHLAND PARK"

TAX LOT 4600
TAX MAP 3 1E 12DA
LOT 17
"HIGHLAND PARK"

TAX LOT 4500
TAX MAP 3 1E 12DA
LOT 16
"HIGHLAND PARK"

TAX LOT 4400
TAX MAP 3 1E 12DA
LOT 15
"HIGHLAND PARK"

LOT 20 "ED'S ORCHARD"
LOT 21 "ED'S ORCHARD"
LOT 22 "ED'S ORCHARD"
LOT 23 "ED'S ORCHARD"
LOT 36 "ED'S ORCHARD"
LOT 37 "ED'S ORCHARD"
LOT 38 "ED'S ORCHARD"
LOT 39 "ED'S ORCHARD"
LOT 40 "ED'S ORCHARD"
LOT 41 "ED'S ORCHARD"

TRACT A
OPEN SPACE

TRACT B
STORMWATER FACILITY

TRANSMISSION LINE TOWER
TRANSMISSION LINE TOWER
POSSIBLE WELL
FLAGPOLE
SHOP
GRAVEL
GRAVEL

REMAINDER OF
TAX LOT 1790
TAX MAP 3 1E 12D
DOC. NO. 2013-070117

TAX LOT 1101
TAX MAP 3 2E 07C

TAX LOT 1201

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aks-eng.com

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FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

WHEELER FARMS

OREGON CITY

OREGON
CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

POST-DEVELOPED CATCHMENT (BASIN MAP)

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE:	06/19/2017

PRELIMINARY
NOT FOR
CONSTRUCTION

REVISIONS

JOB NUMBER
5621

SHEET
1

AKS DRAWING FILE: 5621 BASIN POST.DWG | LAYOUT: POST

APPENDIX 4-1

BMP SIZING TOOL REPORT

WES BMP Sizing Software Version 1.6.0.1, August 2015

WES BMP Sizing Report

Project Information

Project Name	Wheeler Farms
Project Type	Subdivision
Location	19566 Central Point Road, Oregon City
Stormwater Management Area	30000
Project Applicant	Rian Park Development, Inc.
Jurisdiction	OutofDistrict

Drainage Management Area

Name	Area (sq-ft)	Pre-Project Cover	Post-Project Cover	DMA Soil Type	BMP
Roof (77 Lots)	203,280	Forested	Roofs	C	Pond
Total Pervious Grass	249,972	Forested	Grass	C	Street Swale
Street, Sidewalk and Driveway Approach	186,750	Forested	ConventionalConcrete	C	Street Swale
Total Pervious Landscape	249,971	Forested	LandscapeCsoil	C	Street Swale
Future Roof (7 Lots)	18,480	Forested	Roofs	C	Pond

LID Facility Sizing Details

LID ID	Design Criteria	BMP Type	Facility Soil Type	Minimum Area (sq-ft)	Planned Areas (sq-ft)	Orifice Diameter (in)
Street Swale	WaterQuality	Vegetated Swale - Filtration	C3	5,763.4	9,500.0	3.5

Pond Sizing Details

Pond ID	Design Criteria(1)	Facility Soil Type	Max Depth (ft)(2)	Top Area (sq-ft)	Side Slope (1:H)	Facility Vol. (cu-ft)(3)	Water Storage Vol. (cu-ft)(4)	Adequate Size?
Pond	FCWQT	D1	5.25	17,900.0	3	73,584.5	51,242.3	Yes

1. FCWQT = Flow control and water quality treatment, WQT = Water quality treatment only

2. Depth is measured from the bottom of the facility and includes the three feet of media (drain rock, separation layer and growing media).

3. Maximum volume of the facility. Includes the volume occupied by the media at the bottom of the facility.

4. Maximum water storage volume of the facility. Includes water storage in the three feet of soil media assuming a 40 percent porosity.

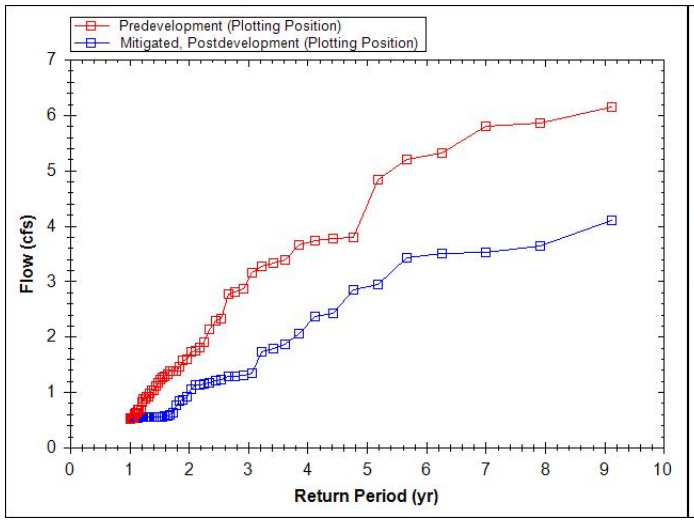
Custom Pond Geometry Configuration

Pond ID: Pond
Design: FlowControlAndTreatment

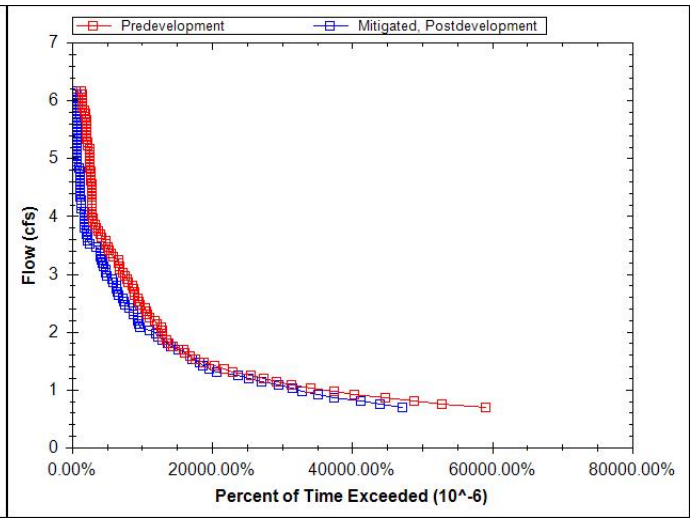
Shape Curve

Depth (ft)	Area (sq ft)	Discharge (cfs)
NaN	NaN	NaN

Flow Frequency Chart



Flow Duration Chart



BMP Sizing Tool

File

Project | Discharge Management Areas | Best Management Practices | Report | Warnings (2)

Add New Best Management Practice

Pond | Street Swale

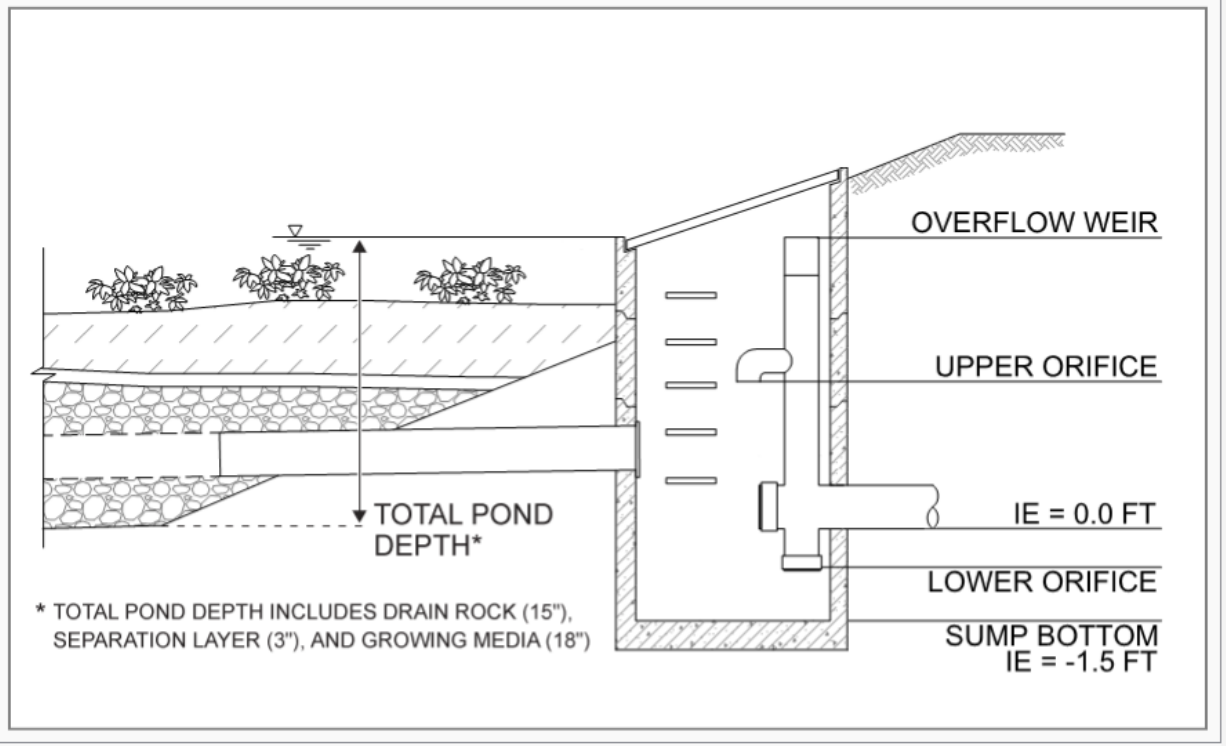
Detention Pond

Name	Pond
Facility Infiltration Rate	D1 (0.02 - 0.07 in/hr)
Treatment Type	Treatment and Flow Control

Geometry | Outlet Structure | Tributary Areas

Lower Orifice Diameter	3.4	in
Lower Orifice Invert	0.0	ft
Upper Orifice Diameter	12.6	in
Upper Orifice Invert	3.5	ft
Weir Length	6.3	ft
Weir Invert	4.3	ft

Facility Schematic | Flow Duration | Peak Flows



APPENDIX 5-1

STORMWATER FACILITIES LOCATION AND DETAIL

SCALE: 1"=60 FEET
60 0 24 36 48 60
ON 34" X 24" PAPER

HAZEL CREEK DRIVE
TOLSTRUP DRIVE
HAZELNUT AVENUE
BLANCHET DRIVE
HYDRANGEA LANE
LARENCE LANE
WHEELER WAY
SKELLENGER WAY
HAZEDELL AVENUE
WHITE LANE
ORCHARD GROVE DRIVE
WINNIE WAY
WHEELER FARM ROAD

TAX LOT 1500
TAX MAP 3 1E 12D

TAX LOT 3800
TAX MAP 3 1E 12DA
LOT 9
"HIGHLAND PARK"

TAX LOT 3900
TAX MAP 3 1E 12DA
LOT 10
"HIGHLAND PARK"

TAX LOT 4000
TAX MAP 3 1E 12DA
LOT 11
"HIGHLAND PARK"

TAX LOT 4300
TAX MAP 3 2E 07CB
LOT 43 "HAZEL CREEK FARMS"

TAX LOT 4400
TAX MAP 3 2E 07CB
LOT 44
"HAZEL CREEK FARMS"

TAX LOT 4500
TAX MAP 3 2E 07CB
LOT 45
"HAZEL CREEK FARMS"

TAX LOT 4600
TAX MAP 3 2E 07CB
LOT 46
"HAZEL CREEK FARMS"

TAX LOT 4700
TAX MAP 3 2E 07CB
LOT 47
"HAZEL CREEK FARMS"

TAX LOT 4800
TAX MAP 3 2E 07CB
LOT 48
"HAZEL CREEK FARMS"

TAX LOT 5500
TAX MAP 3 1E 12DA
LOT 26
"HIGHLAND PARK"

TAX LOT 5400
TAX MAP 3 1E 12DA
LOT 25
"HIGHLAND PARK"

TAX LOT 5300
TAX MAP 3 1E 12DA
LOT 24
"HIGHLAND PARK"

TAX LOT 5600
TAX MAP 3 1E 12DA
LOT 27
"HIGHLAND PARK"

TAX LOT 5700
TAX MAP 3 1E 12DA
LOT 28
"HIGHLAND PARK"

TAX LOT 5800
TAX MAP 3 1E 12DA
LOT 29
"HIGHLAND PARK"

TAX LOT 5900
TAX MAP 3 1E 12DA
LOT 30
"HIGHLAND PARK"

TAX LOT 6000
TAX MAP 3 1E 12DA
LOT 31
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WHEELER FARMS

OREGON

OREGON CITY

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

STORMWATER FACILITIES LOCATION

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED

DATE: 06/19/2017

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

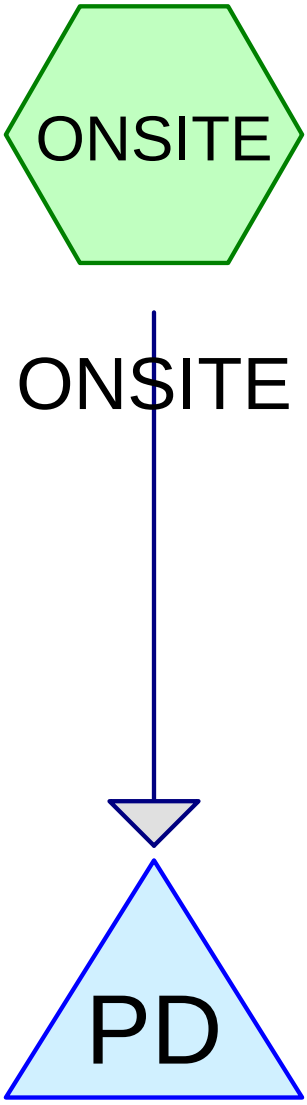
JOB NUMBER
5621

SHEET
1

AKS DRAWING FILE: 5621 BASIN POST.DWG | LAYOUT: LOCATION

APPENDIX 6-1

EMERGENCY OVERFLOW CALCULATIONS



Detention Pond

Subcat Reach Pond Link

Drainage Diagram for 5621 Overflow HydroCad
Prepared by AKS Engineering & Forestry, LLC, Printed 6/7/2017
HydroCAD® 8.50 s/n 005096 © 2007 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
11.500	86	Pervious (ONSITE)
9.400	98	Impervious (ONSITE)
20.900		TOTAL AREA

Soil Listing (all nodes)

Area (acres)	Soil Goup	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
20.900	Other	ONSITE
20.900		TOTAL AREA

Time span=0.00-24.00 hrs, dt=0.15 hrs, 161 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ONSITE: ONSITE — Runoff Area=20.900 ac 44.98% Impervious Runoff Depth>3.53"
Flow Length=300' Slope=0.0200 '/' Tc=26.2 min CN=86/98 Runoff=13.84 cfs 6.155 af

Pond PD: Detention Pond — Peak Elev=430.66' Storage=52,110 cf Inflow=13.84 cfs 6.155 af
Outflow=13.43 cfs 5.089 af

Total Runoff Area = 20.900 ac Runoff Volume = 6.155 af Average Runoff Depth = 3.53"
55.02% Pervious = 11.500 ac 44.98% Impervious = 9.400 ac

Summary for Subcatchment ONSITE: ONSITE

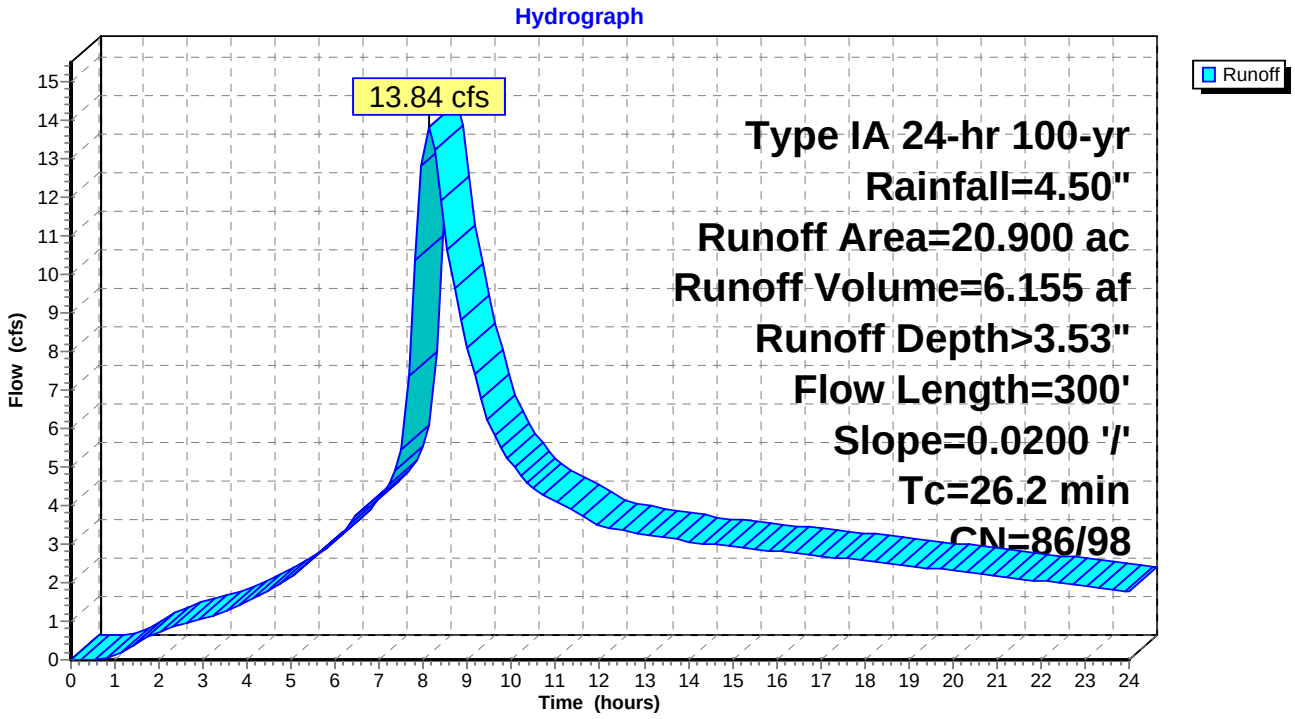
Runoff = 13.84 cfs @ 8.12 hrs, Volume= 6.155 af, Depth> 3.53"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.15 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (ac)	CN	Description
*	11.500	86	Pervious
*	9.400	98	Impervious
	20.900	91	Weighted Average
	11.500	86	Pervious Area
	9.400	98	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.2	300	0.0200	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 2.60"

Subcatchment ONSITE: ONSITE



Summary for Pond PD: Detention Pond

Inflow Area = 20.900 ac, 44.98% Impervious, Inflow Depth > 3.53" for 100-yr event
Inflow = 13.84 cfs @ 8.12 hrs, Volume= 6.155 af
Outflow = 13.43 cfs @ 8.24 hrs, Volume= 5.089 af, Atten= 3%, Lag= 7.3 min
Primary = 13.43 cfs @ 8.24 hrs, Volume= 5.089 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.15 hrs
Peak Elev= 430.66' @ 8.24 hrs Surf.Area= 19,134 sf Storage= 52,110 cf

Plug-Flow detention time= 198.0 min calculated for 5.057 af (82% of inflow)
Center-of-Mass det. time= 87.7 min (805.5 - 717.8)

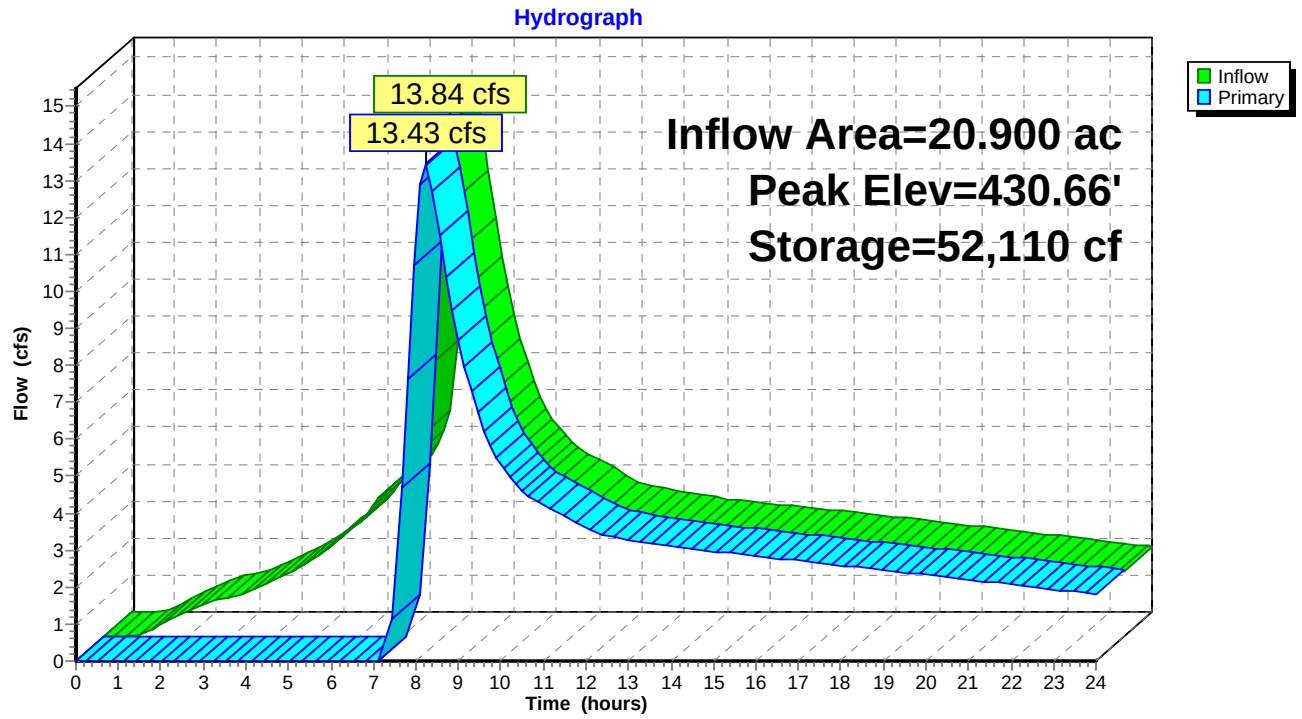
Volume	Invert	Avail.Storage	Storage Description
#1	427.50'	58,625 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
427.50	13,800	0	0
431.00	19,700	58,625	58,625

Device	Routing	Invert	Outlet Devices
#1	Primary	430.25'	20.0' long x 5.0' breadth Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=13.37 cfs @ 8.24 hrs HW=430.66' (Free Discharge)
└1=Weir (Weir Controls 13.37 cfs @ 1.62 fps)

Pond PD: Detention Pond



APPENDIX 7-1

SOIL INFORMATION FROM THE USDA SOIL SURVEY OF CLACKAMAS COUNTY, OREGON

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

April 14, 2017

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://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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 Web Soil Survey, the site for official soil survey information.

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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: 1:3,130 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

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:
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 11, Sep 16, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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**
8B	Bornstedt silt loam, 0 to 8 percent slopes	9.9	44.2%
46B	Jory stony silt loam, 3 to 8 percent slopes	10.3	45.9%
92F	Xerochrepts and Haploxerolls, very steep	2.2	9.9%
Totals for Area of Interest		**22.5**	**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

8B—Bornstedt silt loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 227t
Elevation: 300 to 650 feet
Mean annual precipitation: 48 to 65 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 140 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bornstedt and similar soils: 85 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bornstedt

Setting

Landform: Terraces, hillslopes
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed old alluvium

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 33 inches: silty clay loam
H3 - 33 to 71 inches: silty clay

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Other vegetative classification: Moderately Well Drained < 15% Slopes (G002XY004OR)
Hydric soil rating: No

Minor Components

Borges

Percent of map unit: 5 percent
Landform: Depressions on terraces, hillslopes

Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

Aquults

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

46B—Jory stony silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2251
Elevation: 250 to 1,200 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Jory and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

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

Typical profile

H1 - 0 to 8 inches: stony silt loam
H2 - 8 to 48 inches: stony silty clay
H3 - 48 to 60 inches: stony silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural 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 storage in profile: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Other vegetative classification: Well drained < 15% Slopes (G002XY002OR)
Hydric soil rating: No

92F—Xerochrepts and Haploxerolls, very steep

Map Unit Setting

National map unit symbol: 2281
Elevation: 50 to 1,000 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Xerochrepts and similar soils: 50 percent
Haploxerolls and similar soils: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Xerochrepts

Setting

Landform: Terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium derived from igneous rock

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 48 inches: gravelly clay loam
H3 - 48 to 60 inches: very cobbly clay loam

Properties and qualities

Slope: 20 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural 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: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Haploxerolls

Setting

Landform: Terraces
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Colluvium derived from igneous rock

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 60 inches: very gravelly loam

Properties and qualities

Slope: 20 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 36 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

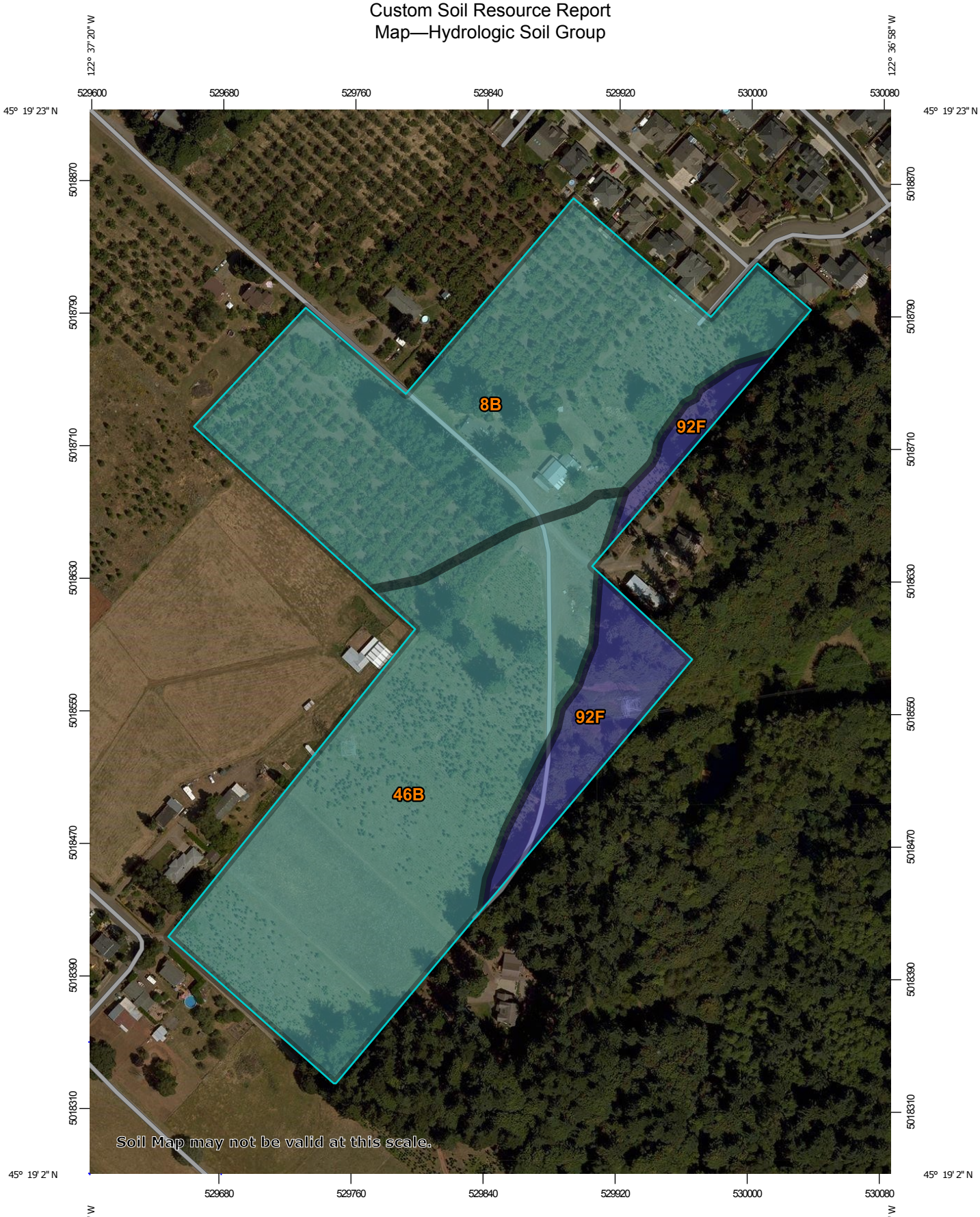
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.



Map Scale: 1:3,130 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

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 Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

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:
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 11, Sep 16, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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.

Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Clackamas County Area, Oregon (OR610)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
8B	Bornstedt silt loam, 0 to 8 percent slopes	C	9.9	44.2%
46B	Jory stony silt loam, 3 to 8 percent slopes	C	10.3	45.9%
92F	Xerochrepts and Haploxerolls, very steep	B	2.2	9.9%
Totals for Area of Interest			**22.5**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

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APPENDIX 8-1

RELEVANT INFORMATION

TABLE 3.5.2B SCS WESTERN WASHINGTON RUNOFF CURVE NUMBERS

SCS WESTERN WASHINGTON RUNOFF CURVE NUMBERS (Published by SCS in 1982)					
Runoff curve numbers for selected agricultural, suburban and urban land use for Type 1A rainfall distribution, 24-hour storm duration.					
LAND USE DESCRIPTION		CURVE NUMBERS BY HYDROLOGIC SOIL GROUP A	B	C	D
Cultivated land(1):	winter condition	86	91	94	95
Mountain open areas:	low growing brush and grasslands	74	82	89	92
Meadow or pasture:		65	78	85	89
Wood or forest land:	undisturbed or older second growth	42	64	76	81
Wood or forest land:	young second growth or brush	55	72	81	86
Orchard:	with cover crop	81	88	92	94
Open spaces, lawns, parks, golf courses, cemeteries, landscaping.					
good condition:	grass cover on 75% or more of the area	68	80	86	90
fair condition:	grass cover on 50% to 75% of the area	77	85	90	92
Gravel roads and parking lots		76	85	89	91
Dirt roads and parking lots		72	82	87	89
Impervious surfaces, pavement, roofs, etc.		98	98	98	98
Open water bodies:	lakes, wetlands, ponds, etc.	100	100	100	100
Single Family Residential (2)					
Dwelling Unit/Gross Acre	% Impervious (3)				
1.0 DU/GA	15	Separate curve number shall be selected for pervious and impervious portion of the site or basin			
1.5 DU/GA	20				
2.0 DU/GA	25				
2.5 DU/GA	30				
3.0 DU/GA	34				
3.5 DU/GA	38				
4.0 DU/GA	42				
4.5 DU/GA	46				
5.0 DU/GA	48				
5.5 DU/GA	50				
6.0 DU/GA	52				
6.5 DU/GA	54				
7.0 DU/GA	56				
Planned unit developments, condominiums, apartments, commercial business and industrial areas.	% impervious must be computed				

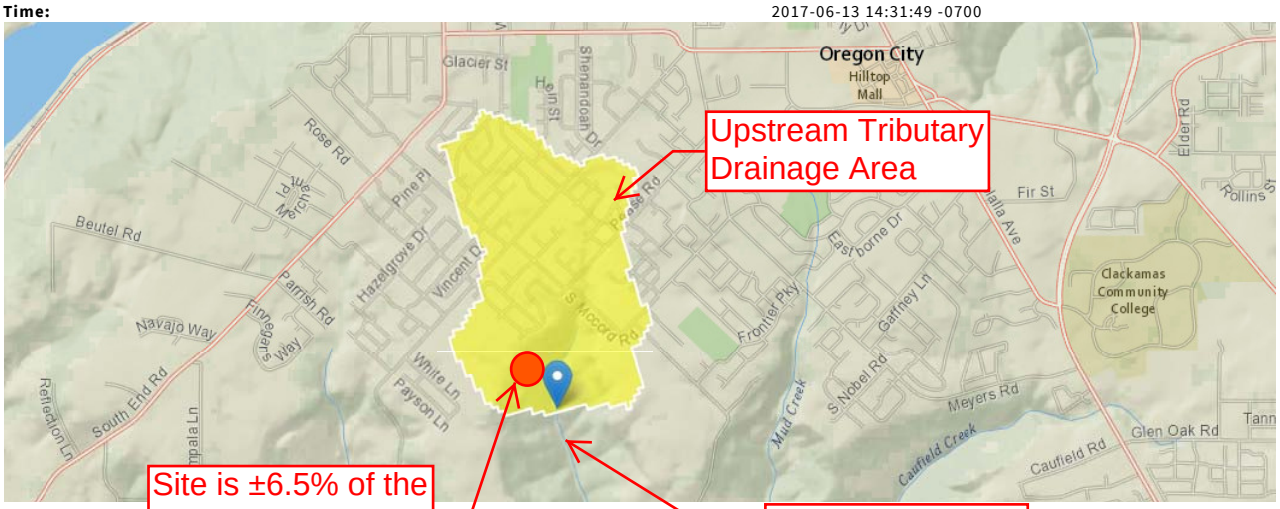
(1) For a more detailed description of agricultural land use curve numbers refer to National Engineering Handbook, Section 4, Hydrology, Chapter 9, August 1972.
(2) Assumes roof and driveway runoff is directed into street/storm system.
(3) The remaining pervious areas (lawn) are considered to be in good condition for these curve numbers.

APPENDIX 9-1

UPSTREAM TRIBUTARY DRAINAGE MAP

StreamStats Report

Region ID:	OR
Workspace ID:	OR20170613173107274000
Clicked Point (Latitude, Longitude):	45.31848, -122.61513
Time:	2017-06-13 14:31:49 -0700

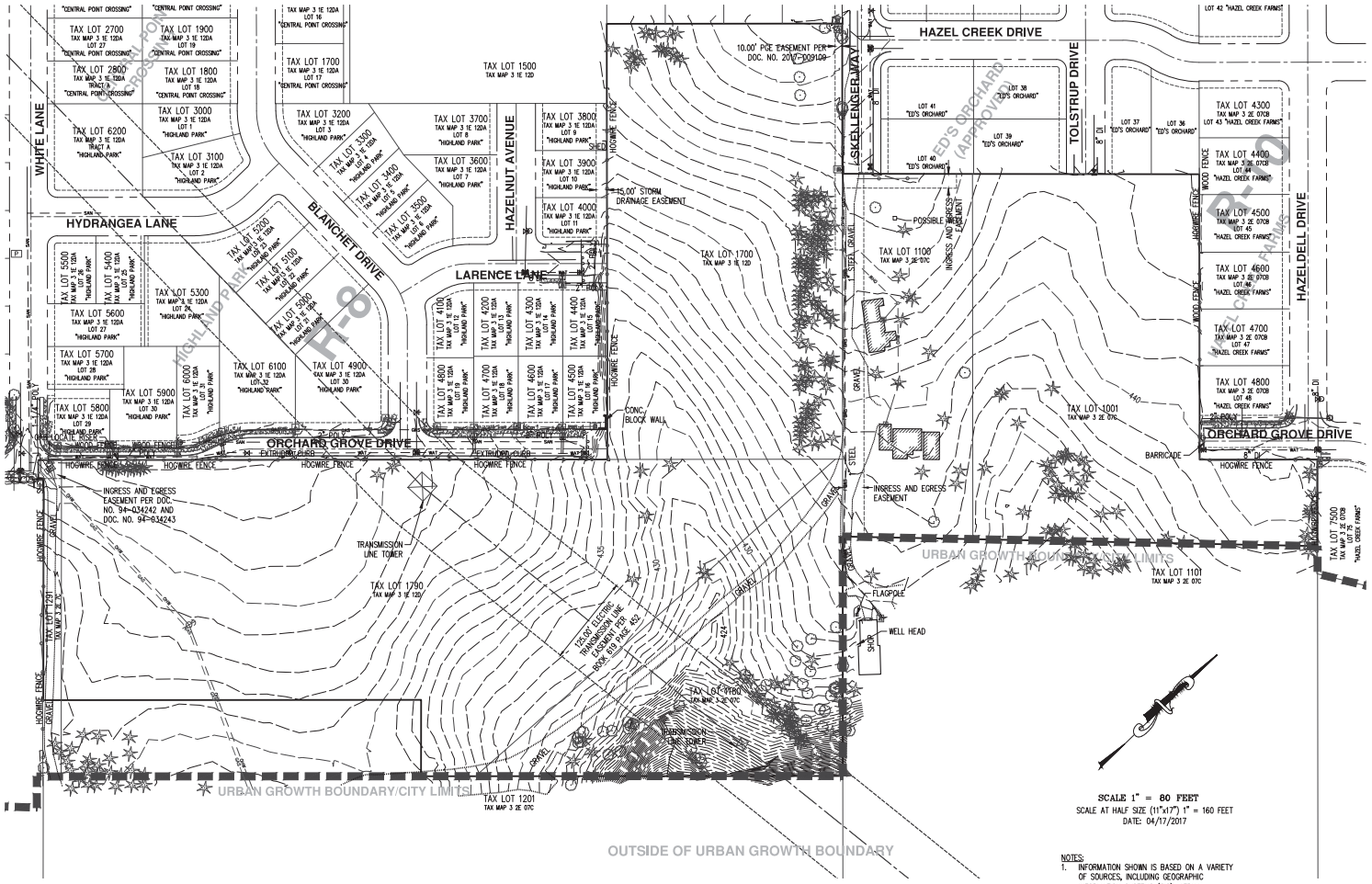


Wheeler Farms

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.55	square miles
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precitation intensity index	1.98	inches
SOILPERM	Average Soil Permeability	0.54	inches per hour
WATCAPORC	Available water capacity from STATSGO data using methods from SIR 2005-5116	0.15	inches
JANMAXT2K	Mean Maximum January Temperature from 2K resolution PRISM 1961-1990 data	46.6	degrees F
ORREG2	Oregon Region Number	10001	dimensionless
BSLOPD	Mean basin slope measured in degrees	3.56	degrees
JANMINT2K	Mean Minimum January Temperature from 2K resolution PRISM PRISM 1961-1990 data	34.3	degrees F
ELEV	Mean Basin Elevation	433	feet
PRECIP	Mean Annual Precipitation	49.3	inches
MINTEMP	Mean annual minimum air temperature over basin surface area as defined in SIR 2008-5126	43	degrees F

Exhibit L: Neighborhood Meeting Materials



SCALE 1" = 80 FEET
SCALE AT HALF SIZE (11"x17") 1" = 160 FEET
DATE: 04/17/2017

NOTES:
1. INFORMATION SHOWN IS BASED ON A VARIETY OF SOURCES, INCLUDING GEOGRAPHIC INFORMATION SYSTEMS (GIS), AERIAL PHOTOGRAPHS, AS-BUILT INFORMATION, AND TAX ASSESSOR MAP INFORMATION.
2. DIMENSIONS SHOWN ARE APPROXIMATE.

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WHEELER FARMS

OREGON CITY, OREGON
TAX LOTS 1700, 1100, 1291, 1001, 1790, 1180 CLACKAMAS CO. TAX MAPS 3S2E07C, 3S1E12D

PRELIMINARY EXISTING CONDITION PLAN

DESIGNED BY:
DRAWN BY:
CHECKED BY: MBH
SCALE: AS NOTED
DATE: 05/16/2017

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 5621

SHEET 1

AKS DRAWING FILE: 5621 NEIGHBOR PLANS.DWG | LAYOUT: 1

SCALE 1" = 80 FEET
SCALE AT HALF SIZE (11"x17") 1" = 160 FEET
DATE: 04/17/2017

NOTES:
1. INFORMATION SHOWN IS BASED ON A VARIETY OF SOURCES, INCLUDING GEOGRAPHIC INFORMATION SYSTEMS (GIS), AERIAL PHOTOGRAPHS, AS-BUILT INFORMATION, AND TAX ASSESSOR MAP INFORMATION.
2. DIMENSIONS SHOWN ARE APPROXIMATE.

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WHEELER FARMS

OREGON CITY, OREGON
TAX LOTS 1700, 1100, 1291, 1001, 1790, 1180 CLACKAMAS CO. TAX MAPS 3S2E07C, 3S1E12D

PRELIMINARY SUBDIVISION LAYOUT

DESIGNED BY:
DRAWN BY:
CHECKED BY: MBH
SCALE: AS NOTED
DATE: 05/16/2017

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 5621

SHEET 2

AKS DRAWING FILE: 5621 NEIGHBOR PLANS.DWG | LAYOUT: 2

AERIAL PHOTO PLAN

WHEELER FARMS

OREGON CITY OREGON

TAX LOTS 1700, 1100, 1291, 1001, 1790, 1180 CLACKAMAS CO. TAX MAPS 3S2E07C, 3S1E12D

PRELIMINARY NOT FOR CONSTRUCTION

DESIGNED BY:
DRAWN BY: MRH
CHECKED BY:
SCALE: AS NOTED
DATE: 05/16/2017

REVISIONS

JOB NUMBER 5621

SHEET 3

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Date: 5-18-17		South End Neighborhood Association Meeting			
#	Name:	Address:		Phone #:50	
1	Harryette Shuell	Street:	19067 Maywood St	Home:	503-722-8467
		Email:	shuell8055@comcastnet	Cell:	
2	LEE + SUE MULLER	Street:	11952 HAZEL PARK DR	Home:	
		Email:	harleylee@juno.com	Cell:	
3	CHRIS GOODELL	Street:	12965 SW HERMAN ROAD TUALATIN	Home:	
		Email:	chris g@aks-eng.com	Cell:	
4	Tom O'Brien	Street:	19364 HAZELGROVE DR	Home:	503-723-3334
		Email:	HAVE IT	Cell:	
5	JOHN WILLIAMS	Street:	1176 SUNNY LANE	Home:	
		Email:		Cell:	
6	Brenda Wheeler	Street:	19725 Orchard Grove Drive	Home:	need email
		Email:	brendaspidelwheeler@gmail.com	Cell:	
7	Joe Wheeler	Street:	19725 Orchard Grove Dr.	Home:	
		Email:	joe.e.wheeler@comcast.net	Cell:	503.260.6104
8	Renee Buell	Street:	11835 Partlow R	Home:	208-870-1444
		Email:	reneebuell@gmail.com	Cell:	
9	Mike Day	Street:		Home:	
		Email:	Mday@orcity.org	Cell:	(503) 793-2202

Date: 5-18-17		South End Neighborhood Association Meeting			
#	Name:	Address:		Phone #:	
1	TONY KONKOL	Street:	OREGON CITY - CITY HALL	Home:	503 657.0891
		Email:		Cell:	
2	Charity Smith	Street:	19310 Tower Hill Drive	Home:	503-735-5741
		Email:		Cell:	
3	Judy Peitz	Street:	19380 Hazel Grove Dr.	Home:	503-655-7977
		Email:		Cell:	
4	Jim Peitz	Street:	" " " "	Home:	"
		Email:	jimpeitz@gmail.com.	Cell:	
5	Gary Johnson	Street:	18813 PAULSON DR	Home:	
		Email:		Cell:	
6	Don Wheeler	Street:	19898 S. White Lane	Home:	
		Email:		Cell:	
7	Joyce Clark	Street:	18649 Joyce Ct	Home:	
		Email:	ella2luv2@q.com	Cell:	503-313-7338
8	Gary Fergus	Street:		Home:	
		Email:		Cell:	
9	Kevin Ertel	Street:	888 South End Rd	Home:	
		Email:	kpertel@hotmail.com	Cell:	

Date: 5-18-17		South End Neighborhood Association Meeting			
#	Name:	Address:		Phone #:	
1	KEITH / CHERYL STRICKLAND	Street:	18967 PAULSEN DR., O.C	Home:	
		Email:		Cell:	
2	MJ Militante	Street:	PO Box 601 OC	Home:	
		Email:	militante@att.net	Cell:	
3		Street:		Home:	
		Email:		Cell:	
4		Street:		Home:	
		Email:		Cell:	
5		Street:		Home:	
		Email:		Cell:	
6		Street:		Home:	
		Email:		Cell:	
7		Street:		Home:	
		Email:		Cell:	
8		Street:		Home:	
		Email:		Cell:	
9		Street:		Home:	
		Email:		Cell:	

TUALATIN · VANCOUVER · SALEM-KEIZER
12965 SW HERMAN RD., SUITE 100 · TUALATIN, OR 97062
AKS ENGINEERING & FORESTRY
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P: (503) 563-6151 F: (503) 563-6152

May 30, 2017

Neighborhood Meeting Minutes: Wheeler Farms Subdivision
19566 Central Point Road, Oregon City, OR

Meeting Date: May 19, 2017
Time: 7:00 PM
Location: Oregon City United Methodist Church, 18955 South End Road, Oregon City, OR

The Applicant attended a South End Neighborhood Association meeting to present details to neighbors and community members in preparation for the submission of land use applications for a zone change and subdivision. Chris Goodell, with AKS Engineering & Forestry, was present. An overview of the project location, current and future zoning, lot sizes, lot configuration, public utilities, public streets, open space tracts, and recent surrounding developments was provided. The planned applications and a general process and timeframe for the land use reviews and construction permitting process were described. Sign-in sheets and business cards were provided.

Following the presentation, attendees asked questions and/or provided general comments about the project. The following topics were discussed:

- Other projects in the area
- Traffic/ construction traffic on S. Central Point Road
- Estimated price of future homes
- Growth in area over time
- Off-site intersections
- Wheeler family history (provided by Don Wheeler)

The meeting concluded at approximately 8:00 p.m.

Sincerely,
AKS ENGINEERING & FORESTRY, LLC

Chris Goodell, AICP, LEED[AP]

Exhibit M: City Pre-Application Conference Summary

Pre-Application Conference Notes

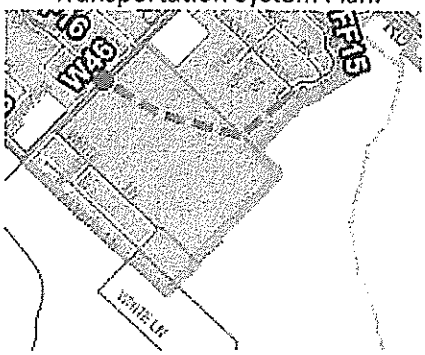
(PA 16-54, December 6, 2016)

These are preliminary notes based on the application submitted.

Proposed Project: Approximately 83± lot subdivision and rezone

General Information:

- Location: Located in the vicinity southeast of Orchard Grove Dr.
  Clackamas County Map 3-2E-07C, tax lots: 101, 1291, 1100, 1180
  Clackamas County Map 3-1E-12D, tax lots: 1700 and 1790
- Zoning: R-10 Single-Family Dwelling District
- Overlay Districts: Geologic Hazards, Natural Resource Overlay District
- Street Designations: Central Point RD: Collector
- Transportation System Plan:



Planning Review and Application Fees:

The Planning Division fees for this application are anticipated to increase on January 1st. The 2017 Planning applications and fees include-

- Subdivision: $4,136 plus $344 per lot
- Mailing Labels: $15 – or provided by applicant
- Transportation Study: $1,365 + $682 for Large Study Area/Near Key Corridor + $2,046 for Zone Change
- Zone Change: $2,798
- Natural Resource Overlay District: $1,959
- Property Line Adjustment: $1,159
- Geologic Hazards Review: See Public Works Notes

Review Process:

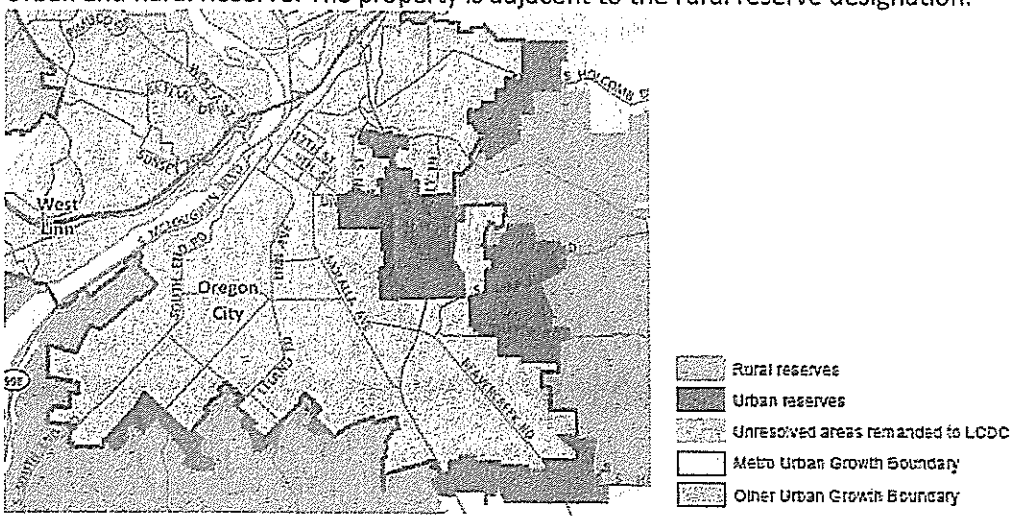
Though the Subdivision itself is a **Type II** application the Zone Change is a **Type IV** application, and thus the combined applications are subject to a Type IV process. Type IV decisions include only quasi-judicial plan amendments and zone changes. These applications involve the greatest amount 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 within the comment period) may appeal the planning commission denial to the city commission. If the planning commission denies the application and no appeal has been received within fourteen 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 subject to review by the land use board of appeals (LUBA) within twenty-one days of when it becomes final.

Subdivision Layout

- The proposed layout generally complies with the Planning requirements within the Oregon City Municipal Code.
- The right-of-way adjacent to lot 62 and 72 is awkward and should be contain a wider width.
- Submit documentation identifying the lot averages the minimum square footage of the zoning designation and that no lot is less than 20% of that size.. The lot widths, depths, and frontage appear to comply with minimums.
- A tree removal and mitigation plan is required which must include the lot setbacks and the caliper of the trees to be removed as well as the species, caliper and location of the mitigation trees. The tree mitigation plan report shall be prepared by a certified arborist, horticulturalist or forester or other environmental professional with experience and academic credentials in forestry or arborculture. Provide sufficient documentation if utilizing the following exemption in 17.41.040:

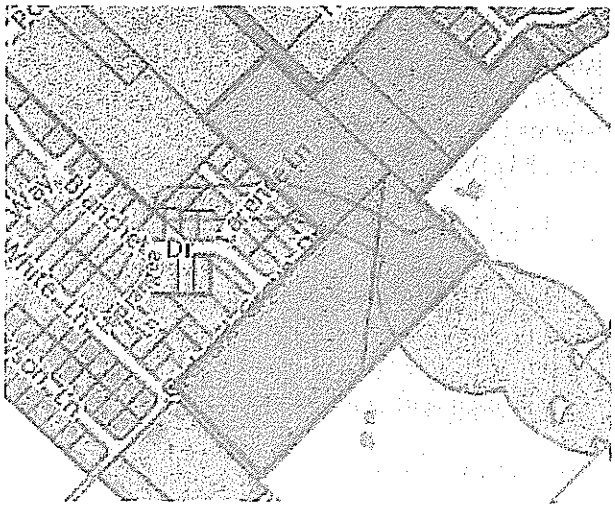
  These standards are not intended to regulate farm and forest practices as those practices are defined under ORS 30.930. Farm or forest resources. An applicant for development may claim exemption from compliance with these standards if the development site containing the regulated grove or trees was a designated farm or forest use, tree farm, Christmas tree plantation, or other approved timber use within one year prior to development application. "Forest practices" and "forestlands" as used in this subsection shall have the meaning as set out in ORS 30.930.
- Provide additional details about Tract B. Will this include a heritage tree site?
- A street tree plan including one for every 35' of frontage is required in accordance with OCMC 12.08. Please provide total frontage length in the application to demonstrate the number of street trees is correct.
- Identify all existing structures to remain and demonstrate compliance with required setbacks, lot coverage, etc.
- Urban and Rural Reserve: The property is adjacent to the rural reserve designation.



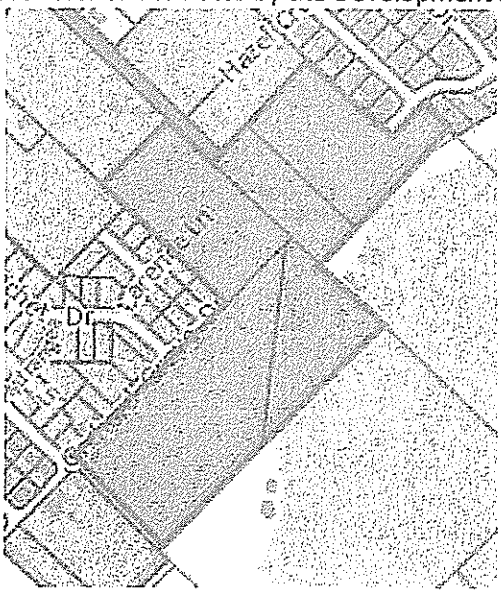
Zone Change:
Identify compliance with the Zone Change criteria in OCMC 17.68.020, which includes findings for compliance with state land use goals and the Oregon City Comprehensive Plan.

Property Line Adjustment
The proposed Property Line Adjustment is unclear, please provide additional specificity. Please provide a clear depiction of the site before and after and indicate property ownership for tax lot 1180 and 1291. If under the same ownership in the site, they are considered part of the development.

Natural Resource Overlay District (NROD)
A portion of the site is within the Natural Resource Overlay District. An application prepared by a qualified professional and in compliance with OCMC 17.49 is required.



Geologic Hazards Overlay District:
Please refer to the notes by the Development Services Department.

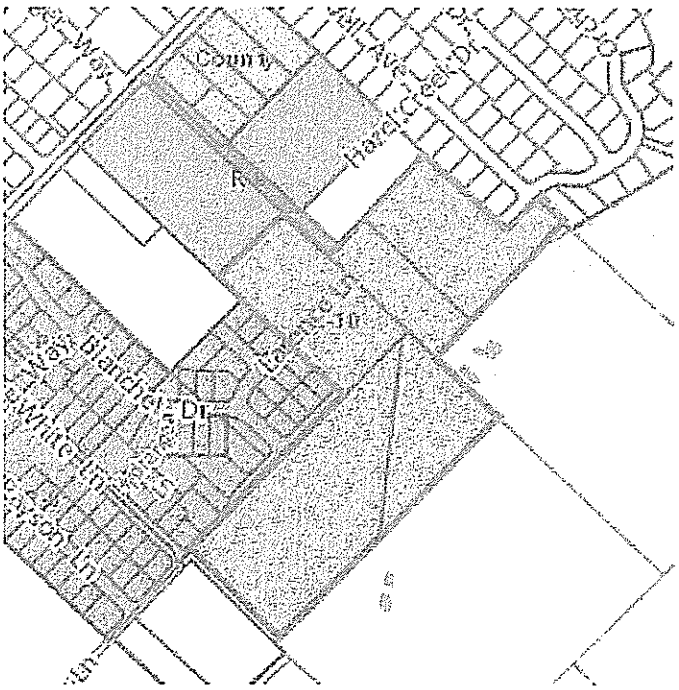


Questions from the Applicant

1. Please discuss the zone change process and confirm if the R-8 is an acceptable zone for this site.

Response: Please see the above description of the Type IV process. This may be further defined in OCMC 17.50.030.D. Criteria for the Zone Change is identified in OCMC 17.68.020.

2. Please confirm that a Comprehensive Plan Map Amendment would not be necessary with a zone change to R-8, as all tax lots are within the Low Density Residential Comprehensive Plan designation.
   Response: The Low Density Residential Comprehensive Plan designation includes the R-10, R-8 and R-6 Single-Family Dwelling Districts.
3. Please confirm the minimum and maximum residential densities in the R-8 and R-10 districts, and please confirm that the densities shown in the layouts provided are acceptable to the City.
   Response: Minimum and maximum densities are described in Title 16 as well as the zoning designation proposed. Minimum density is 80% of the maximum allowed. Lot sizes may be up to 20% smaller than the minimum, provided the subdivision averages to the minimum.
4. Please confirm if the preliminary layouts/lot configurations are acceptable to the City.
   Response: Please see the notes within this report.
5. Please confirm the required setbacks, lot dimensions, and lot areas.
   Response: Please refer to the dimensional standards of the zoning designation in 17.08 or 17.10.
6. Are there any overlay designations that will apply to this property?
   Response: Yes, please see the first section of this report.
7. Please let us know of any tree removal requirements or concerns.
   Response: Tree removal requirements are identified in OCMC 17.49 for those within the NROD and 17.41
8. Please confirm the City review procedure type and the required land use application(s).
   Response: Please see notes above.
9. Please let us know if any additional studies or analyses (natural resources, geotechnical, soils, etc.) are necessary.
   Response: Please see notes above.
10. Please discuss any pending/future Municipal Code changes and what impact those Code changes may have on this application/project.
    Response: None yet, but we will be working on code changes in 2017.



Transportation Review:

City of Oregon City | PO Box 3040 | 221 Molalla Avenue, Suite 200 | Oregon City, OR 97045
Ph (503) 722-3789 www.orcity.org

Your application was reviewed by John Replinger of Replinger and Associates, a city consultant for transportation engineering. You may contact John Replinger, at Replinger-Associates@comcast.net or at 503.719.3383.

Based on your submittal, a traffic engineer shall conduct a transportation study in conformance with the City's *Guidelines for Transportation Impact Analyses* available on the Oregon City website. Based on the information provided by the applicant, it appears the trip generation exceeds the level at which the project's transportation analysis requirements can be satisfied by submittal of a Transportation Analysis Letter (TAL). A full Transportation Impact Analysis (TIA) will be required. Among other requirements, a full TIA includes conducting traffic counts and operational analysis of impacted intersections will be required. Intersections to be analyzed include the site access and intersections of collector/collector and higher where traffic volumes from the development exceed 20 peak hour trips.
Because the proposal includes a zone change, the applicant will also need to address the requirements of Oregon's Transportation Planning Rule. Specifically, the applicant shall address the provisions of 660-12-0060 Plan and Land Use Regulation Amendments. When a zone change is proposed, a future year analysis is required assessing the impact associated with the planning horizon specified in the city's adopted Transportation System Plan.

The applicant and his traffic engineer should review the *Guidelines for Transportation Impact Analyses* and the most recent mobility standards as specified in Oregon City Municipal Code section 12.04.205.

The applicant and his traffic engineer should review the Guidelines for Transportation Impact Analyses and the most recent mobility standards as specified in Oregon City Municipal Code section 12.04.205.

Planning Division
Laura Terway, Planning Manager with the Oregon City Planning Division reviewed your pre-application. You may contact Laura Terway at 503.496.1553 or lterway@orcity.org.

Development Services Division
Wendy Marshall, Development Project Manager with the Oregon City Development Services Division reviewed your pre-application. You may contact Wendy Marshall at 503.496.1548 or wmarshall@orcity.org.

Building Division:
Your application was transmitted to our Building Official whom provided comments. You may contact Mike Roberts, Building Official, at 503.496.1517 or mroberts@orcity.org if you have any building related questions.

Clackamas County Fire:
Your application was transmitted to Mike Boumann, Lieutenant Deputy Fire Marshal of Clackamas County Fire District #1. No comments were returned regarding your application. You may contact Mr. Boumann at 503.742.2660 or at michaelbou@ccfd1.com.

Other notes:

- A neighborhood meeting is required. You are in the Hazel Grove-Westling Farms (Non-active Neighborhood Association). Contact the South End Neighborhood Association to setup a meeting.
  Chair: Bill McConnel, sena97045@gmail.com
  Vice Chair: Gary Fergus, Interim Vice Chair fergusfamily@gmail.com
  Secretary/Treasurer: vacant
- Per Annexation AN 06-02, each new home is required to pay a Police fee of $3,500 if submitted prior to July 1, 2018. Copies of the recorded agreements are attached.
- The questions regarding the park space were forwarded to Phil Lewis, Community Services Director.

- Notice of your proposed development has been provided to the State Historic Preservation Office (SHPO) and all affected tribes per OCMC chapter 17.62.040.H.
- The existing dwellings and all accessory structures shall be removed prior to final plat unless they comply with all new standards.
- Fence height limitations provided in OCMC 17.54.100.
- If you would like to build a sign for the subdivision, the sign code can be found in OCMC 15.28.
- Residential Design Standards are provided in OCMC chapter 17.20 and 17.21.
- All applicable System Development Charges (SDC) shall be due and payable upon building permit issuance.
- No proposed changes to the Oregon City Municipal Code are proposed which would affect your proposal.

Oregon City Municipal Code Criteria:
The following chapters of the Oregon City Municipal Code (OCMC) may be applicable to this proposal:
OCMC 12.04 - Streets, Sidewalks and Public Places
OCMC 12.08 - Public and Street Trees
OCMC 13.12 – Stormwater Management
OCMC 16.08 – Subdivisions – Processes and Standards
OCMC 16.12 – Minimum Improvements and Design Standards for Land Divisions
OCMC 16.20 – Property Line Adjustments and Abandonments
OCMC 17.08 – "R-10" Single-Family Dwelling District
OCMC 17.10 – "R-8" Single-Family Dwelling District
OCMC 17.20 – Residential Design Standards
OCMC 17.41- Tree Protection Standards
OCMC 17.44 – Geologic Hazards
OCMC 17.49 – Natural Resources Overlay District
OCMC 17.50 – Administrative Processes
OCMC 17.68 – Zone Changes and Amendments

Pre-application conferences are required by Section 17.50.050 of the City Code, as follows:
A. Preapplication Conference. Prior to submitting an application for any form of permit, the applicant shall schedule and attend a preapplication conference with City staff to discuss the proposal. To schedule a preapplication conference, the applicant shall contact the Planning Division, submit the required materials, and pay the appropriate conference fee. At a minimum, an applicant should submit a short narrative describing the proposal and a proposed site plan, drawn to a scale acceptable to the City, which identifies the proposed land uses, traffic circulation, and public rights-of-way and all other required plans. The purpose of the preapplication conference is to provide an opportunity for staff to provide the applicant with information on the likely impacts, limitations, requirements, approval standards, fees and other information that may affect the proposal. The Planning Division shall provide the applicant(s) with the identity and contact persons for all affected neighborhood associations as well as a written summary of the preapplication conference. Notwithstanding any representations by City staff at a preapplication conference, staff is not authorized to waive any requirements of this code, and any omission or failure by staff to recite to an applicant all relevant applicable land use requirements shall not constitute a waiver by the City of any standard or requirement.
B. A preapplication conference shall be valid for a period of six months from the date it is held. If no application is filed within six months of the conference or meeting, the applicant must schedule and attend another conference before the City will accept a permit application. The community development director may waive the preapplication requirement if, in the Director's opinion, the development does not warrant this step. In no case shall a preapplication conference be valid for more than one year.

NOTICE TO APPLICANT: A property owner may apply for any permit they wish for their property. HOWEVER, THERE ARE NO GUARANTEES THAT ANY APPLICATION WILL BE APPROVED. No decisions are made until all reports and testimony have been submitted. This form will be kept by the Community Development Department. A copy will be given to the applicant. IF the applicant does not submit an application within six (6) months from the Pre-application Conference meeting date, a NEW Pre-Application Conference will be required.

OREGON CITY

Public Works – Development Services

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DEVELOPMENT SERVICES

PRE-APPLICATION MEETING NOTES

Date: 12-6-2016

Planning Project Number:	PA 16-54
Address:	19566 Central Point Road, Oregon City, OR 97045
Map Number(s):	3-2E-07C; 3-1E-12D
Tax Lot(s):	1001, 1291, 1100, 1180; 1700, 1790
Project Name:	Wheeler Farms
Meeting Date:	December 6, 2016 (Notes updated December 28, 2016)
Reviewer(s):	Hunter Bennett-Daggett, PE

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. A performance bond and agreement shall be provided to the City prior to issuance of construction plans.

3. The Applicant may be required to 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.

4. All applicable System Development Charges (SDC) shall be due and payable upon building permit issuance. Applicant will need to complete a SDC request form, found on the City's website, for an estimate of fees.

ENGINEERING - UTILITIES

Streets

1. The proposed development includes several new streets and extensions of existing streets. All new streets within the proposed development will be functionally classified as a Local (Residential). For a residential local, the Oregon City Municipal Code (OCMC) requires a 54-foot-wide right-of-way (ROW), two (2) 16-foot-wide shared travel lanes, two (2) 5-foot-wide planter strips, two (2) 5-foot-wide sidewalks, and two (2) 0.5-foot-wide public access strips. Additional requirements include curb, gutter, street trees, and street lights.

2. The southwestern edge of the proposed development includes a narrow strip of land that will eventually be part of an extension of White Lane. This strip of land is not wide enough to create a functional half street that aligns with the existing street; however, the aligned portion will need to be dedicated as right-of-way. Fee-in-lieu payment will be required for

street improvements that cannot be constructed due to space constraints. Fee-in-lieu shall be paid to the centerline of the future street.

3. Block length standards, as outlined in OCMC 12.04.195, must be met even for proposed developments adjacent to the Urban Growth Boundary (UGB). The proposed development meets block length requirements, with the exception of the "island" created at the center, which exceeds the 530-foot max block length when considered with the relevant portion of the Ed's Orchard subdivision. As a result, a mid-block pedestrian path is required. The applicant may request that this pedestrian path requirement be waived by providing appropriate justifications, addressing such items as: location of pedestrian generators within the subdivision, number of pedestrians served, most likely routes for pedestrians through the subdivision, the availability of pedestrian routes and circulation, and the available route to Central Point Road (a Collector road).

4. With the exception of White Lane, streets in the proposed development will not be required to extend to the UGB.

5. A 10-foot-wide Public Utility Easement (PUE) will be required along the frontage of all lots.

6. Reduction to the standard improvements and right-of-way dedication may be requested through the modification process outlined in OCMC 12.04.007.

7. The proposed development includes a section of Shared-Use Path, connecting Larence Lane to Orchard Grove Drive. The standard residential local street section shall be considered acceptable for the Shared-Use Path.

8. The portion of Orchard Grove Drive that was not previously built during construction of the Highland Park subdivision shall be constructed to meet residential local street requirements. Fee-in-lieu previously paid for this unconstructed street portion shall be available for construction of the full street improvements as part of the proposed development.

9. Two large trees (54-inch and 43-inch diameter) are located within the proposed Orchard Grove Drive ROW. The applicant has requested consideration of modifications to the required street section to allow preservation of the trees. Due to the location of the trees with respect to the proposed ROW and 10-foot PUE, it does not appear feasible to protect the trees. The root systems of the trees are unknown but are likely to be negatively impacted by grading and utility construction, thereby reducing the long-term health of the trees. In addition, proximity of the root systems to the ROW and PUE causes concern for future root growth effects on utilities in the area, including curb/gutter, sidewalk, pavement, and underground pipe systems. A constrained ROW does not appear to provide adequate space for the ROW, PUE, and grading and utility construction without negative impacts to the trees. If the applicant wishes to preserve the trees, an arborist's report shall be provided addressing the City's concerns and showing that there would be no adverse impacts to the trees from the construction of the grading and underground improvements proposed in the ROW and 10-foot PUE, no long-term adverse impacts to the trees as the root system grows, and no adverse impacts to the public and private improvements as the root system grows.

OREGON CITY

Public Works – Development Services

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Stormwater

1. The proposed development shall adhere to the requirements of the current Stormwater and Grading Design Standards. The current Standards can be found online here:

   http://www.orcity.org/sites/default/files/final_manual_0.pdf

2. The General Threshold(s) for Applicability of the Stormwater and Grading Design Standards:

   a. *Development activities that result in **5,000 square feet of new or replaced impervious surface**, cumulative over a 5-year period, are subject to the requirements of these standards.*

3. If the above threshold is met, the Applicant must submit a completed *Site Assessment and Planning Checklist* (and other attachments as described in **Section 9.1.1**) as part of the land use application process. This submittal shall constitute a preliminary drainage report and form the basis for developing the Stormwater Management Plan described in **Section 9.1.2**. Submittal of the final Stormwater Management Plan will be required prior to issuance of Public Works permits.

4. It does not appear possible to convey stormwater from the proposed development to any existing City stormwater system by gravity. The applicant proposes to construct a new stormwater facility within the proposed development. The proposed facility shall meet the requirements of the City's Stormwater and Grading Design Standards.

5. The submitted materials for some layouts show an access easement to the proposed stormwater facility. An access road shall be provided within the easement, complying with the requirements of the Stormwater and Grading Design Standards. If the access road exceeds 300 feet in length, a truck turn-around shall be provided.

Water

1. There are existing 8-inch ductile iron water mains within Orchard Grove Drive and Larence Lane. New 8-inch ductile iron water mains shall be provided in all streets within the proposed development and shall connect to existing water mains wherever possible. Stubs shall be provided at the end of any streets with future connections.

2. The Highland Park subdivision installed a 4-inch ductile iron water main in the half-street portion of Orchard Grove Drive adjacent to White Lane. This street portion will be extended to full width by the proposed project, and the improvements shall include an 8-inch ductile iron water main that allows the 4-inch water main to be taken out of service.

3. The narrow portion of land at the southwestern edge of the proposed development that will eventually be part of an extension of White Lane is not wide enough to accommodate a water main extension along the frontage, as required. Temporary looping is required along the White Lane ROW until an 8-inch water main is extended when White Lane ROW is fully developed. Proposed water system improvements shall include an 8-inch waterline

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extension to the southeast in the proposed intersection improvements of White Lane and Orchard Grove Drive with reduction to a temporary 4-inch waterline extension in an easement along proposed White Lane ROW and looped to the proposed water pipe at the street intersection of the southeasterly subdivision street.

4. Any new fire hydrants shall be located per the requirements and direction of Clackamas Fire District No. 1.

Sanitary Sewer

1. There are existing 8-inch PVC sanitary sewer pipes within Orchard Grove Drive and Larence Lane. The applicant proposes to connect to these existing sewer pipes via gravity. The City's Sanitary Sewer Master Plan calls for a new public sewer pump station in the area of the proposed development. In order to justify the deviation from the master plan, the applicant will need to demonstrate that the proposed gravity sewer can adequately serve all proposed lots and not negatively impact future development. Proposed gravity sewers shall comply with all applicable City design standards, including minimum sanitary sewer slope requirements.

2. Proposed sanitary sewer depths, slopes, and covers will need to be provided to the City to allow evaluation of shallow sewers. Where shallow sewer laterals are approved by the City, ductile iron pipe is typically required for any sewer with less than three feet of cover.

3. The narrow portion of land at the southwestern edge of the proposed development that will eventually be part of an extension of White Lane is not wide enough to accommodate a sanitary sewer extension along the frontage, as required. Fee-in-lieu will be required to allow for future extension of this sewer.

4. As part of this proposed development, any existing SFRs that are to be demolished must abandon their septic system per State, County, and City requirements. Contact the Building Department regarding abandonment requirements.

Other

1. A portion of the proposed development is within the Natural Resource Overlay District (NROD). Section 17.49 of the OCMC will need to be addressed in the application.

2. A portion of the proposed development is within the Geologic Hazard area. Section 17.44 of the OCMC will need to be addressed in the application. A geotechnical report will be required and shall provide recommendations as applicable for the proposed public and private subdivision improvements. There is a pass-through fee for the City's geotechnical peer review. Total peer review costs shall be paid by the applicant.

3. A portion of the proposed development is within the High Water Table area. The geotechnical report addressing the Geologic Hazard area shall also address high groundwater impacts on construction.

OREGON CITY

Public Works – Development Services

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

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Exhibit N: Site Assessment and Planning Checklist

SITE ASSESSMENT AND PLANNING CHECKLIST

✓	Information needed	Attach supporting materials as needed
2.2.1 Site Information		
	Applicant contact information	Applicant name: Rian Park Development, Inc. Business name: Rian Park Development, Inc. Contact address, phone number, and e-mail: P.O. Box 2559 Oregon City, OR 97045
	Project location	Site address: 19566 Central Point Road, Oregon City Site description: The property is located south of the Ed's Orchard Subdivision, west of Hazel Creek Farms Subdivision, and east of the Highland Park Subdivision. Major drainage basin: Beaver Basin Is the project site located with the WQRA as defined in OCMC 17.49? No (Y/N) *Include a vicinity map of the site (including location of property in relation to adjacent properties, roads, and pedestrian/bike facilities).*
	Project type	Identify types of development planned for the site such as commercial, industrial, single-family residential, multi-family residential, or other (describe): 77 single-family residential lots.
	Size of site	Size of site: 22.56± (acres) Number of existing/proposed tax lots: 6/77 Amount of new and replaced impervious area: 408,510 (SF)
2.2.2 Site Assessment *Note: Site assessment information may be available from the OCMaps online tool available through the City's website.*		
	Site Assessment Map	*Attach engineered scale Site Assessment Map, showing items below.*
	Topography Evaluate site and map slopes: *Flat: 0-10%* *Moderate: 10-25%* *Steep: 25% and greater*	*Surveyed or aerial-based mapping with 2-foot intervals for slopes 0-25% slope and 10-foot intervals for steeper. Indicate Geologic Hazard Areas as defined by OCMC 17.04.510 and Geologic Hazards Overlay Zone as defined by OCMC 17.04.515.*
	Soils and Groundwater Research and map site soil hydrologic group, depth to groundwater	NRCS Hydrologic Soil Type (show on map if more than one type present): C *Attach seasonal groundwater depth evaluation if available or required (site has floodplain and/or wetland). Groundwater depth information is available from the City.*
	Infiltration Assessment Determine soil capacity for onsite infiltration	If an infiltration test is performed, attach the documentation. Report the test type (Basic/Professional) performed and results. See **Appendix D** for the approved infiltration testing methods. Test type: Open Pit Falling Head 0.06 - 0.2 (inches/hour)

SITE ASSESSMENT AND PLANNING CHECKLIST		
	Hydrology – Conditions and Natural Features Map site floodplains, wetlands, streams, and location of outfalls	Clearly label on map all intermittent and perennial creeks/streams/rivers and wetlands, FEMA floodplains, and existing drainage systems (pipes, ditches, outfalls). Check here if present on site: _____ Sensitive area(s) _____ Floodplain _____
	Downstream Conveyance	Indicate the proposed point of discharge on the site plan. *Prepare and attach a Downstream Analysis as required by **Chapter 5**.* Check here to verify that adequate downstream capacity is available: X
	Existing Vegetation Map trees and vegetation	Using aerial photos or survey, map all trees and vegetation. Note all existing trees 6-inch caliper and greater (DBH) on map. Delineate and identify other areas and types of existing vegetation. The local planning authority may require a formal tree survey.
	Required Vegetated Buffers and Setbacks Assess and map buffers	Identify required vegetated buffer areas and other setback limits as defined by OCMC Title 17.
	Land Use and Zoning	Existing Land Use Zoning designation(s): R-8
	Access and Parking	Delineate proposed access points for all transportation modes on map. Indicate amount and area of required parking onsite if applicable, *attach documentation as needed.*
	Utilities to Site and Surrounding Area	Map existing utilities including stormwater facilities, storm conveyance, sewer, water, electricity, phone/cable, gas, and any public storm system/facility downstream.
2.2.3 Site Planning Design Objectives *(attach engineered scale Preliminary Site Plan)*		
	1. Preserve existing resources	**Required:** Show sensitive areas and buffers on site plan. Denote buffer areas that require enhancement. Show any proposed areas of encroachment and associated buffer mitigation areas.
	2. Minimize site disturbance	**Required:** Delineate protection areas on site plan for areas to remain undisturbed during construction.
	3. Minimize soil compaction	**Required:** Delineate and note temporary fencing on site plan for proposed infiltration facilities, vegetated stormwater management facilities, and re-vegetation areas.
	4. Minimize imperviousness	**Required:** Delineate proposed impervious areas and proposed impervious area reduction methods on the site plan. A. Total proposed new/replaced impervious area: 408,510 (SF) B. Area of proposed Green Roofs: 0 (SF) C. Area of proposed pervious pavements: 0 (SF) D. Describe type of pavers or pavement proposed: _____ E. Impervious area requiring management [A-(B+C)]: 408,510 (SF)

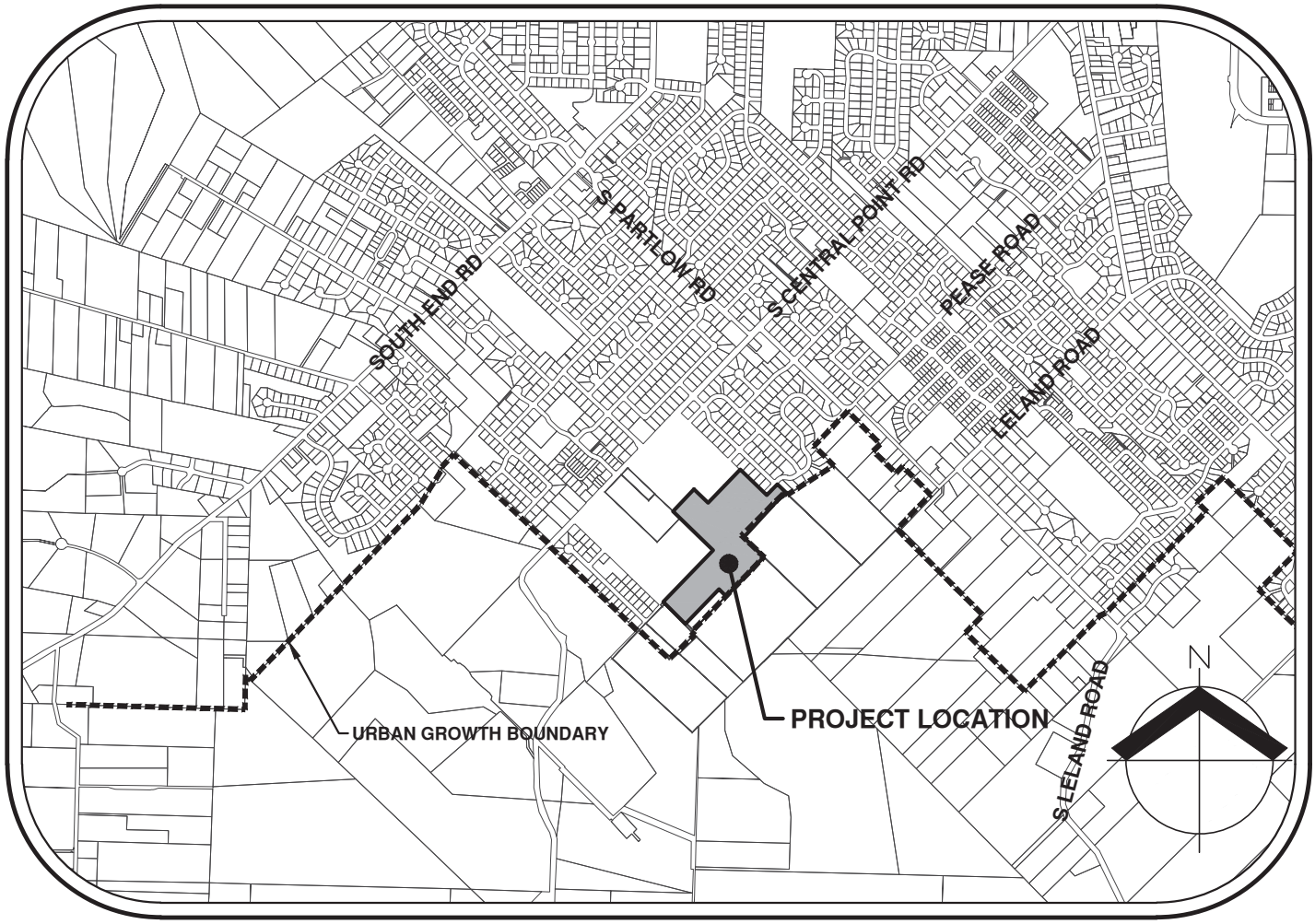
SITE ASSESSMENT AND PLANNING CHECKLIST

2.2.4 Proposed Stormwater Management Strategy

	Proposed Stormwater Management Strategy	X ____ Infiltration facilities X ____ Surface Infiltration facilities to the MEP _____ Full onsite retention/infiltration up to the 10-year storm event _____ Infiltration facilities are limited by the following conditions *(include documentation to demonstrate the limiting condition and choose an alternate strategy below):* _____ Stormwater management facility to be located on fill _____ Steep slopes _____ High groundwater _____ Contaminated soils _____ Conflict with required Source Controls (**Chapter 6**) _____ Onsite Stormwater management facilities (indicate below) _____ Offsite stormwater management facilities/regional facilities _____ Fee in Lieu, as determined by the City
	Preliminary Facility Selection/Sizing	Check all that apply, *attach output from BMP Sizing Tool*, and show proposed Stormwater Management Facilities on Preliminary Site Plan. LID facilities: _____ Infiltration Stormwater Planter _____ Filtration Stormwater Planter _____ Infiltration Rain Garden _____ Filtration Rain Garden X ____ Vegetated Swale X ____ Detention Pond _____ Infiltration Trench _____ Manufactured Treatment Technology _____ Other: _____
	Verify Minimum Facility Size	A. Required surface area of onsite surface infiltration facilities: As determined by BMP sizing tool or engineered method: 23,663 (SF) B. Calculate MEP surface area of surface infiltration facilities for sites with limiting conditions: Total new/replaced impervious area (SF) x 0.10 = 40,851 (SF) C. Calculate required surface area of onsite LID facilities: Smaller of [A] or [B]: 23,663 (SF) D. Proposed surface infiltration facility size(s): From site plan: 27,400 (SF) *must be larger than [C]*

SITE ASSESSMENT AND PLANNING CHECKLIST		
2.2.5 Other Project Requirements		
	Grading Permit	Review OCMC 15.48 to determine whether a grading permit will be required. Grading permit required? Y (Y/N) Type of Grading Plan proposed (see **Chapter 3**): Engineered Grading Plan
	Erosion Prevention and Sediment Control	Identify the required permits: _____ ESC Permit from the City *(sites that include 1,000+ SF new or replaced impervious area)* X 1200-C Permit from DEQ *(sites that disturb 1 acre or more land surface)*
	Source Control for High Use Sites	Identify whether the proposed development will include any of the following: _____ Fuel Dispensing Facilities and Surrounding Traffic Areas _____ Above-Ground Storage of Liquid Materials _____ Solid Waste Storage Areas, Containers, and Trash Compactors _____ Exterior Storage of Bulk Materials _____ Material Transfer Areas/Loading Docks _____ Equipment and/or Vehicle Washing Facilities _____ Development on Land With Suspected or Known Contamination _____ Covered Vehicle Parking Areas _____ Industrial and Commercial High Traffic Areas _____ Other land uses subject to the ODEQ 1200-Z Industrial Stormwater Permit
	Other Permits	Identify other natural resources related permits from local, state, or federal agencies that may be required as part of the proposed development activity. It is the responsibility of the applicant to identify and obtain required permits prior to project approval. List other anticipated permits: N/A

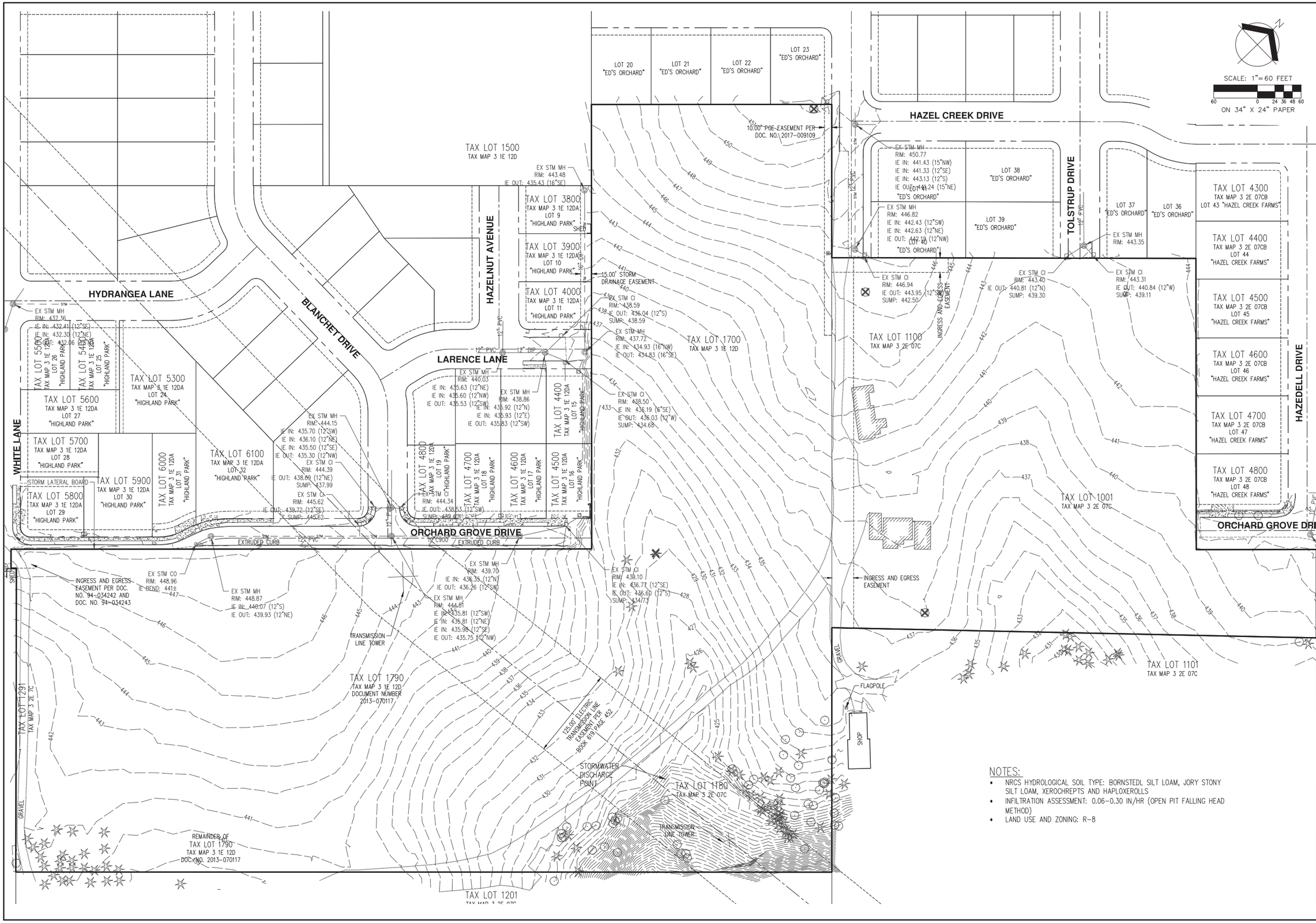
VICINITY MAP



VICINITY MAP

NOT TO SCALE

SITE ASSESSMENT MAP



NOTES:

- NRCS HYDROLOGICAL SOIL TYPE: BORNSTEDL SILT LOAM, JORY STONY SILT LOAM, XEROCHREPTS AND HAPLOXEROLLS
- INFILTRATION ASSESSMENT: 0.06–0.30 IN/HR (OPEN PIT FALLING HEAD METHOD)
- LAND USE AND ZONING: R-8

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ENGINEERING · SURVEYING · NATURAL RESOURCES
FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

WHEELER FARMS

OREGON

OREGON CITY

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

SITE ASSESSMENT MAP

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE:	06/19/2017

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER
5621

SHEET
1

AKS DRAWING FILE: 5621 BASIN PRE.DWG | LAYOUT: ASSES

GEOTECHNICAL ENGINEERING REPORT

GeoPacific Engineering, Inc.

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

June 16, 2017
Project No. 17-4521

Rian Park Development, Inc.
Attn: Bruce Ament
PO Box 2559
Oregon City, OR 97045

CC: Vu Nguyen, AKS Engineering & Forestry via email: VuN@aks-eng.com

SUBJECT: GEOTECHNICAL ENGINEERING REPORT
WHEELER FARMS SUBDIVISION
TAX LOTS 31E12D (01700/1790); 32E07C (1291/1180/1100/1001)
OREGON CITY, OREGON

This report presents the results of a geotechnical exploration conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above-referenced project. The purpose of our work was to evaluate subsurface conditions at the site and provide recommendations for site development. This geotechnical exploration was performed in accordance with GeoPacific Proposal No. P-6025 dated March 16, 2017 and your subsequent authorization of our proposals and *General Conditions for Geotechnical Services*.

SITE AND PROJECT DESCRIPTION

The subject site is located at the eastern terminus of South White Lane in Oregon City, Clackamas County, Oregon. The property consists of six parcels that total approximately 22.5 acres. Topography is flat to gently sloping to the southeast with grades of 5 to 20 percent. Grades steepen to approximately 50 percent grade to the east. A large, prehistoric or ancient (greater than 150 years old) landslide is located along the eastern property line and beyond. One home and auxiliary structure currently occupies the site. Vegetation consists primarily of short grasses and dense to sparse trees. Two parcels are occupied by orchard and Christmas trees are present elsewhere. A 125 foot electric transmission line easement bisects the central portion of the property.

It is our understanding that the proposed development will consist of a 77 lot subdivision for single family homes, new streets, water quality facility, open space, and associated underground utilities. The grading plan provided for our review indicates maximum cuts will be on the order of 13 feet and fills will be on the order of about 10 feet.

REGIONAL GEOLOGIC SETTING

Regionally, the subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

The subject site lies on a broad volcanic plateau underlain by the Boring Lava Formation which formed during a period of Plio-Pleistocene (5 to 0.2 million years ago) volcanism and faulting (Schlicker and Finlayson, 1979). The Boring Lava consists mainly of basaltic lava flows, but locally contains tuff breccia, ash, tuff, cinders, and scoriaceous volcanic debris flows deposited on the flanks of volcanic cones. The flows are commonly light gray to nearly black, with lighter tones predominating, and are characterized by columnar jointing and flow structures. The upper surface of the Boring Lava is typically weathered to depths of 25 feet or more with the upper 5 to 15 feet consisting of red-brown, clayey silt to silty clay soil.

Underlying the Boring Lava is the late Miocene to late Pliocene age (6 to 1.6 million years old) Troutdale Formation (Madin, 2009; Schlicker and Finlayson, 1979). In the site vicinity, the Troutdale Formation consists primarily of massive mudstone, claystone, and siltstone with minor sandstone and water-laid tuff. Ripples, channels and cross bedding structures are common, indicating a fluvial origin of deposition. Locally, the Troutdale Formation may contains organic material including wood and logs.

REGIONAL SEISMIC SETTING

At least three major source zones capable of generating damaging earthquakes are thought to exist in the vicinity of the subject site.

Portland Hills Fault Zone

The Portland Hills Fault Zone is a series of NW-trending faults that include the central Portland Hills Fault, the western Oatfield Fault, and the eastern East Bank Fault. These faults occur in a northwest-trending zone that varies in width between 3.5 and 5.0 miles. The combined three faults vertically displace the Columbia River Basalt by 1,130 feet and appear to control thickness changes in late Pleistocene (approx. 780,000 years) sediment (Madin, 1990). The Portland Hills Fault occurs along the Willamette River at the base of the Portland Hills, and is about 5 miles northeast of the site. The Oatfield Fault occurs along the western side of the Portland Hills, and is about 4.5 miles northeast of the site. The accuracy of the fault mapping is stated to be within 500 meters (Wong, et al., 2000). No historical seismicity is correlated with the mapped portion of the Portland Hills Fault Zone, but in 1991 a M3.5 earthquake occurred on a NW-trending shear plane located 1.3 miles east of the fault (Yelin, 1992). Although there is no definitive evidence of recent activity, the Portland Hills Fault Zone is assumed to be potentially active (Geomatrix Consultants, 1995).

Gales Creek-Newberg-Mt. Angel Structural Zone

The Gales Creek-Newberg-Mt. Angel Structural Zone is a 50-mile-long zone of discontinuous, NW-trending faults that lies about 16 miles southwest of the subject site. These faults are recognized in the subsurface by vertical separation of the Columbia River Basalt and offset seismic reflectors in the overlying basin sediment (Yeats et al., 1996; Werner et al., 1992). A recent geologic reconnaissance and photogeologic analysis study conducted for the Scoggins Dam site in the

Tualatin Basin revealed no evidence of deformed geomorphic surfaces along the structural zone (Unruh et al., 1994). No seismicity has been recorded on the Gales Creek or Newberg Faults (the faults closest to the subject site); however, these faults are considered to be potentially active because they may connect with the seismically active Mount Angel Fault and the rupture plane of the 1993 M5.6 Scotts Mills earthquake (Werner et al. 1992; Geomatrix Consultants, 1995).

Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year (Goldfinger et al., 1996). A growing body of geologic evidence suggests that prehistoric subduction zone earthquakes have occurred (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). This evidence includes: (1) buried tidal marshes recording episodic, sudden subsidence along the coast of northern California, Oregon, and Washington, (2) burial of subsided tidal marshes by tsunami wave deposits, (3) paleoliquefaction features, and (4) geodetic uplift patterns on the Oregon coast. Radiocarbon dates on buried tidal marshes indicate a recurrence interval for major subduction zone earthquakes of 250 to 650 years with the last event occurring 300 years ago (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). The inferred seismogenic portion of the plate interface lies roughly along the Oregon Coast at depths of 20 and 40 kilometers below the ocean surface.

FIELD EXPLORATION

Our site-specific exploration for this report was conducted on April 20, May 9, and May 10, 2017. Ten exploratory test pits were excavated with a medium sized trackhoe to depths ranging between 10 and 12 feet at the approximate locations shown on Figure 2. Two exploratory borings (designated B-1 and B-2) were drilled with a track mounted drill rig to depths of 35 to 101.5 feet at the approximate locations indicated on Figure 2. It should be noted that exploration locations were located in the field by pacing or taping distances from apparent property corners and other site features shown on the plans provided. As such, the locations of the explorations should be considered approximate.

The boreholes were drilled using a track mounted drill rig and mud rotary methods operated by Western States Soil Conservation, Inc. of Hubbard, Oregon. At each boring location, SPT (Standard Penetration Test) sampling was performed in general accordance with ASTM D1586 using a 2-inch outside diameter split-spoon sampler and a 140-pound hammer equipped with a rope and cathead mechanism. During the test, a sample is obtained by driving the sampler 18 inches into the soil with the hammer free-falling 30 inches. The number of blows for each 6 inches of penetration is recorded. The Standard Penetration Resistance ("N-value") of the soil is calculated as the number of blows required for the final 12 inches of penetration. If 50 or more blows are recorded within a single 6-inch interval, the test is terminated, and the blow count is recorded as 50 blows for the number of inches driven. This resistance, or N-value, provides a measure of the relative density of granular soils and the relative consistency of cohesive soils. At the completion of the borings, the holes were backfilled with bentonite.

A GeoPacific geologist continuously monitored the field exploration program and logged the explorations. Soils observed in the explorations were classified in general accordance with the Unified Soil Classification System. Rock hardness was classified in accordance with Table 1, modified from the ODOT Rock Hardness Classification Chart. During exploration, our geologist also noted geotechnical conditions such as soil consistency, moisture and groundwater conditions.

Logs of the test pits and borings are attached to this report. The following report sections are based on the exploration program and summarize subsurface conditions encountered at the site.

Table 1. Rock Hardness Classification Chart

ODOT Rock Hardness Rating	Field Criteria	Unconfined Compressive Strength	Typical Equipment Needed For Excavation
Extremely Soft (R0)	Indented by thumbnail	<100 psi	Small excavator
Very Soft (R1)	Scratched by thumbnail, crumbled by rock hammer	100-1,000 psi	Small excavator
Soft (R2)	Not scratched by thumbnail, indented by rock hammer	1,000-4,000 psi	Medium excavator (slow digging with small excavator)
Medium Hard (R3)	Scratched or fractured by rock hammer	4,000-8,000 psi	Medium to large excavator (slow to very slow digging), typically requires chipping with hydraulic hammer or mass excavation)
Hard (R4)	Scratched or fractured w/ difficulty	8,000-16,000 psi	Slow chipping with hydraulic hammer and/or blasting
Very Hard (R5)	Not scratched or fractured after many blows, hammer rebounds	>16,000 psi	Blasting

SUBSURFACE CONDITIONS

Results of the field exploration program indicate the site is underlain by a topsoil horizon, residual soil and weathered rock belonging to the Boring Lava Formation, and residual soil and weathered rock belonging to the Troutdale Formation. The observed soil and groundwater conditions are summarized below.

Topsoil – The ground surface in test pits TP-1 through TP-10 and borings B-1 and B-2 was directly underlain by a moderately organic topsoil horizon. The topsoil horizon was composed of light brown clayey silt (OL-ML) that contained fine roots throughout. The topsoil generally extended to a depth of 8 to 12 inches and had a medium stiff consistency.

Residual Soil of Boring Lava Formation – Underlying the topsoil horizon in test pits TP-1 through TP-10 and borings B-1 and B-2 was clayey silt (ML) to silty clay (CL) residual soil resulting from in-place weathering of the underlying Boring Lava Formation. The light reddish brown silty clay to clayey silt contained weathered basalt fragments and was generally characterized by a stiff to very stiff consistency. In explorations, the residual soil extended to a depth of 2.5 to 8 feet.

Boring Lava Formation – Highly weathered basalt belonging to the Boring Lava Formation was encountered beneath the residual soil in test pits TP-1 through TP-10 and borings B-1 and B-2. The basalt was weathered to extremely soft (R0) to very soft (R1) and contained trace silty clay to clayey silt matrix. In test pits TP-1 through TP10, the extremely soft (R0) to very soft (R1) basalt extended beyond the maximum depth of exploration (10 to 12 feet). The extremely soft (R0) to

very soft (R1) basalt transitioned to soft (R2) to medium hard (R3) basalt in borings B-1 and B-2 at depths of 9 and 18 feet, respectively. The soft (R2) to medium hard (R3) basalt extended beyond the maximum depth of exploration in boring B-2 (35 feet). The medium-size trackhoe used for our explorations was able to excavate the R0 and R1 basalt with relative ease and practical refusal was not met in any test pit explorations to a maximum depth of 12 feet.

Residual Soil of Troutdale Formation – Underlying the basalt belonging to the Boring Lava Formation in boring B-1 was clayey silt (ML) with trace sand residual soil resulting from in-place weathering of the underlying Troutdale Formation. The light brown clayey silt exhibited dark red mottling and was generally characterized by a very stiff consistency. In boring B-1, the residual soil of the Troutdale Formation extended to a depth of 31 feet.

Troutdale Formation – The residual soil of the Troutdale Formation in boring B-1 was underlain by mudstone belonging to the Troutdale Formation. The mudstone was weathered and classified as extremely soft (R0) to very soft (R1) according to the ODOT Rock Hardness Chart (Table 1). The mudstone was brown to brownish gray in color and trace laminar bedding could be observed. The mudstone extended to a depth of approximately 57 feet and standard penetration testing indicate a hard consistency with N values on the order of N=41 to N=50 for 5.5 inches. The weathered mudstone was underlain by extremely soft (R0) sandstone that contained trace silt. Standard penetration testing indicates the sandstone is very dense with N-values ranging from N=64 to N=50 for 5.75 inches. The highly weathered sandstone extended beyond the maximum depth of exploration in boring B-1 (101.5 feet).

Groundwater

On April 20 and May 9-10, 2017, soils encountered in explorations were damp to moist. Static groundwater was not encountered in test pits to a depth of 12 feet. Groundwater could not be determined in the borings due to mud rotary techniques. Perched groundwater seepage was encountered in test pit TP-9 at a depth of 6 feet. Discharge was visually estimated at less than ¼ gallon per minute. Regional groundwater mapping by Snyder (2008) indicates groundwater levels are approximately 40 to 60 feet below the existing ground surface. Experience has shown that temporary perched storm-related groundwater conditions often occur within the surface soils over fine-grained native deposits such as those beneath the site, particularly during the wet season. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors.

The 1979 Geology and Geologic Hazards Study by Schlicker and Finlayson identifies the area has having wet soils and/or a high water table; this is the study that primarily helped modify Oregon City's development code to require that groundwater concerns be addressed. This regionally mapped wet soils condition is predominantly created by storm runoff during the wet season due to the impermeable clay soils derived from the Boring Lava Formation and slow draining topography of the Oregon City plain. Such shallow, perched groundwater is a lesser geotechnical issue than seeps or springs created from groundwater emanating from below due to geologic structural control of groundwater flow. The effects of shallow perched groundwater are most pronounced in low-lying areas which are currently mapped as wetlands and stay wet for longer periods, perhaps year round. At the time of the 1979 report, areas of severe concern such as low-lying wetlands and drainages could still be developed. This report served as a warning for those attempting to develop in low-lying areas that localized development sites may have more severe problems than the average site in the region and that specific types of constructed systems may experience water related difficulties. The report specifically addresses concerns relating to hydrostatic pressures on basement walls, underground storage tanks, and poor performance of septic systems. We do not

believe that any of these constructed systems are currently proposed at the Wheeler Farms Subdivision.

INFILTRATION TESTING

Soil infiltration testing was performed using the open hole infiltration method in test pits TP-1 through TP-10 at depths of 5 and 12 feet, as indicated on Table 2. The soil was pre-saturated for a period of over 3 hours. The water level was measured to the nearest tenth of an inch every half hour with reference to the ground surface. Table 2 presents the results of our falling head infiltration testing and do not incorporate a factor of safety.

Table 2. Summary of Infiltration Test Results

Test Pit	Depth (feet)	Soil Type	Infiltration Rate (in/hr)	Hydraulic Head Range (inches)
TP-1	5	Highly Weathered Basalt	***0.9***	7-11
TP-2	5	Highly Weathered Basalt	***1.3***	8-14
TP-3	12	Highly Weathered Basalt	***2.8***	6-20
TP-4	12	Highly Weathered Basalt	0.2	23-24
TP-5	12	Highly Weathered Basalt	0.06	23-24
TP-6	5	Silty Clay (CL) to Clayey Silt (ML) (Residual Soil)	***4.0***	2-13
TP-7	5	Silty Clay (CL) to Clayey Silt (ML) with Basalt (Residual Soil)	***3.5***	11-19
TP-8	5	Highly Weathered Basalt	0.1	25-26
TP-9	5	Highly Weathered Basalt	***1.4***	14-20
TP-10	5	Highly Weathered Basalt	0.3	24-26

Note: Test results considered too high for materials observed.

Slope Stability

For the purpose of evaluating slope stability, we: (1) reviewed of published geologic mapping, (2) performed a field reconnaissance of the property, and (3) performed a program of subsurface exploration including test pits and borings.

Landslide inventory mapping of the Oregon City Quadrangle and the statewide landslide database indicates the headscarp of a prehistoric or ancient landslide (greater than 150 years old) is present along the southeastern property line, as indicated on Figure 1B (Burns and Madin, 2009, Dogami SLIDO, 2017). The landslide is classified as a rock slide-rotational with an earthflow component. The Dogami SLIDO database indicates the landslide is deep seated with a failure depth of approximately 70 to 75 feet. Our reconnaissance and review of Lidar based high resolution digital

elevation maps (Dogami, 2017) indicate slope geomorphology adjacent to the ancient landslide is smooth and uniform. No evidence of recent movement (ground cracks, scarps, or hummocky topography) was observed during our reconnaissance.

The Troutdale Formation, which underlies the site vicinity at depth, includes a thick sequence of weak sedimentary strata that are prone to instability on moderate to steep slopes. Regionally, many large landslides are mapped within the Troutdale Formation primarily on the side slopes of drainages where stream erosion has deeply incised the formation and created oversteepened slopes (Schlicker and Finlayson, 1979; Madin, 1994; Madin and Burns, 2006). In areas where the Troutdale Formation is capped by Boring Lava, these landslides are known to propagate upslope by undermining large blocks of Boring Lava Formation.

Subsurface exploration indicates that the ground surface is underlain by residual soil and weathered rock belonging to the Boring Lava Formation underlain by residual soil and weathered mudstone and sandstone belonging to the Troutdale Formation. Pocket penetrometer measurements of the residual soil of the Boring Lava Formation indicate an approximate unconfined compressive strength of 1.0 to 4.5 tons/ft^2 which correlates to a stiff to very stiff consistency. The residual soil extended to a depth of 2.5 to 8 feet and was underlain by weathered Boring Lava basalt. Standard penetration tests in borings B-1 and B-2 indicate that the basalt has a generally stiff to hard consistency with N-values ranging between N=4 and N=50 for less than 1 inch. In boring B-1, the basalt was underlain by residual soil of the Troutdale Formation that had a very stiff consistency with N-values ranging between N=14 and N=18. The residual soil extended to a depth of 31 feet and was underlain by weathered mudstone belonging to the Troutdale Formation. The mudstone had a hard consistency with N-values of N=41 to N=50 for 4.5 inches. In boring B-1, the mudstone was underlain by weathered sandstone that was very dense with N-values of N=56 to N=50 for 5 inches. No weak zones such as volcanic ash layers were observed in explorations and contacts between the layers appeared to be gradational. Our explorations indicate that native soils underlying the slope are characterized by moderate shear strength and a moderate to high resistance to slope instability.

In our opinion, prior slope instability southeast of and along the southeastern property line of the site likely resulted from failure of steeply sloping exposures of the Troutdale Formation and undermining of the Boring Lava. Since the failure occurred greater than 150 years ago, slopes adjacent to the landslide are less steep and existing landslide debris support the toe of the slope. Existing Boring Lava and Troutdale Formation materials are very stiff to hard and no evidence of recent landslide movement was observed. In order to prevent damage caused by reactivation of the headscarp of the existing slide, a 50 foot horizontal building to top of steep slope setback is recommended for lots adjacent to the headscarp (Lots 51 through 53, Lot 63, and Lot 64.

CONCLUSIONS AND RECOMMENDATIONS

Our investigation indicates that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. In our opinion, the greatest geotechnical constraint for this project is the potential for encountering hard rock boulders and the steep slope in the southeastern portion of the site. Due to the presence of the headscarp and prehistoric/ancient landslide along the southeast property line and to the southeast of the property, a 50 foot horizontal building to top of steep slope setback is recommended for structures on Lots 51 through 53, Lot 63, and Lot 64.

The Boring Lava Formation, which underlies the site, is known for hard, rounded basalt boulders which could hamper excavations (such as for utility trenching). The rock encountered in test pits

was highly weathered and excavatable to depths of 10 to 12 feet and practical refusal was not achieved. Large, hard boulders should be expected throughout the site that could make deep excavations difficult. Contractors should be prepared to manage difficult excavation conditions and budget accordingly.

Stormwater Disposal

The results of our infiltration testing indicate that soils have a limited infiltration capacity at depths of 5 and 12 feet below the ground surface in clayey silt to silty clay residual soils and weathered basalt, as shown on Table 2. Testing conducted in test pits TP-1 through TP-3, TP-6, TP-7, and TP-9 yielded higher infiltration rates than testing conducted elsewhere at the site under similar geologic conditions. These higher rates may be due to fractures in the weathered basalt or rooted zones within the residual soil that would likely silt up over time or become saturated quickly in a storm event.

Infiltration test methods and procedures attempt to simulate the as-built conditions of the planned subsurface disposal system. However, due to natural variations in soil properties, actual infiltration rates may vary from the measured and/or recommended design rates. All systems should be constructed such that potential overflow is discharged in a controlled manner away from structures, and all systems should include an adequate factor of safety. Infiltration rates presented in this report should not be applied to inappropriate or complex hydrological models such as a closed basin without extensive further studies. This report presents infiltration test results only, and should not be construed as an approval of a system design.

Site Preparation

Areas of proposed buildings, new streets, and areas to receive fill should be cleared of vegetation and any organic and inorganic debris. Existing buried structures, should be demolished and any cavities structurally backfilled. Inorganic debris and organic materials from clearing should be removed from the site.

Existing fill and any organic-rich topsoil should then be stripped from construction areas of the site or where engineered fill is to be placed. Fill was not encountered in our explorations; however, areas of fill may be present elsewhere at the site, especially in the vicinity of the exiting structures. The estimated depth range necessary for removal of topsoil in cut and fill areas is approximately 6 to 9 inches, respectively. Deeper stripping may be necessary to remove large tree roots in orchard and Christmas tree areas. The final depth of soil removal will be determined on the basis of a site inspection after the stripping/ excavation has been performed. Stripped topsoil should preferably be removed from the site. Any remaining topsoil should be stockpiled only in designated areas and stripping operations should be observed and documented by the geotechnical engineer or his representative. Any remaining undocumented fills and subsurface structures (tile drains, basements, driveway and landscaping fill, old utility lines, septic leach fields, etc.) should be removed and the excavations backfilled with engineered fill.

Once stripping of a particular area is approved, the area must be ripped or tilled to a depth of 12 inches, moisture conditioned, root-picked, and compacted in-place prior to the placement of engineered fill or crushed aggregate base for pavement. Exposed subgrade soils should be evaluated by the geotechnical engineer. For large areas, this evaluation is normally performed by proof-rolling the exposed subgrade with a fully loaded scraper or dump truck. For smaller areas where access is restricted, the subgrade should be evaluated by probing the soil with a steel probe. Soft/loose soils identified during subgrade preparation should be compacted to a firm and unyielding condition, over-excavated and replaced with engineered fill (as described below), or

stabilized with rock prior to placement of engineered fill. The depth of overexcavation, if required, should be evaluated by the geotechnical engineer at the time of construction.

Excavating Conditions and Utility Trenches

We anticipate that on-site soils can be excavated using conventional heavy equipment such as scrapers and trackhoes. Highly weathered basalt bedrock was encountered in explorations throughout the site at depths of 2.5 to 8 feet. Practical refusal on soft (R2) to medium hard (R3) basalt boulders was not achieved in explorations. Our test pit explorations indicate the basalt bedrock is moderately weathered and excavation depths of 12 feet should be obtainable with conventional heavy equipment. Deeper excavations may encounter harder rock and based on our experience with soils in this area, large, hard boulders can be commonly encountered during construction activities. The selected contractor for site development should be prepared for encountering boulders.

All temporary cuts in excess of 4 feet in height should be sloped in accordance with U.S. Occupational Safety and Health Administration (OSHA) regulations (29 CFR Part 1926), or be shored. The existing native soils classify as Type B Soil and temporary excavation side slope inclinations as steep as 1H:1V may be assumed for planning purposes. This cut slope inclination is applicable to excavations above the water table only. Maintenance of safe working conditions, including temporary excavation stability, is the responsibility of the contractor. Actual slope inclinations at the time of construction should be determined based on safety requirements and actual soil and groundwater conditions.

Saturated soils and groundwater may be encountered in utility trenches, particularly during the wet season. We anticipate that dewatering systems consisting of ditches, sumps and pumps would be adequate for control of perched groundwater. Regardless of the dewatering system used, it should be installed and operated such that in-place soils are prevented from being removed along with the groundwater.

Vibrations created by traffic and construction equipment may cause some caving and raveling of excavation walls. In such an event, lateral support for the excavation walls should be provided by the contractor to prevent loss of ground support and possible distress to existing or previously constructed structural improvements.

PVC pipe should be installed in accordance with the procedures specified in ASTM D2321. We recommend that trench backfill be compacted to at least 95% of the maximum dry density obtained by Modified Proctor ASTM D1557 or equivalent. Initial backfill lift thickness for a ¾"-0 crushed aggregate base may need to be as great as 4 feet to reduce the risk of flattening underlying flexible pipe. Subsequent lift thickness should not exceed 1 foot. If imported granular fill material is used, then the lifts for large vibrating plate-compaction equipment (e.g. hoe compactor attachments) may be up to 2 feet, provided that proper compaction is being achieved and each lift is tested. Use of large vibrating compaction equipment should be carefully monitored near existing structures and improvements due to the potential for vibration-induced damage.

Adequate density testing should be performed during construction to verify that the recommended relative compaction is achieved. Typically, one density test is taken for every 4 vertical feet of backfill on each 200-lineal-foot section of trench.

Engineered Fill

All grading for the proposed development should be performed as engineered grading in accordance with the applicable building code at time of construction with the exceptions and additions noted herein. Proper test frequency and earthwork documentation usually requires daily observation and testing during stripping, rough grading, and placement of engineered fill. Imported fill material must be approved by the geotechnical engineer prior to being imported to the site. Oversize material greater than 6 inches in size should not be used within 3 feet of foundation footings, and material greater than 12 inches in diameter should not be used in engineered fill.

Engineered fill should be compacted in horizontal lifts not exceeding 8 inches using standard compaction equipment. We recommend that engineered fill be compacted to at least 95% of the maximum dry density determined by ASTM D698 (Standard Proctor) or equivalent. Field density testing should conform to ASTM D2922 and D3017, or D1556. All engineered fill should be observed and tested by the project geotechnical engineer or his representative. Rocky fill may need to be evaluated by proofrolling and should be placed wet of optimum moisture content. Typically, one density test is performed for at least every 2 vertical feet of fill placed or every 500 yd^3, whichever requires more testing. Because testing is performed on an on-call basis, we recommend that the earthwork contractor be held contractually responsible for test scheduling and frequency. Site earthwork will be impacted by soil moisture and shallow groundwater conditions. Earthwork in wet weather would likely require extensive use of cement or lime treatment, or other special measures, at considerable additional cost compared to earthwork performed under dry-weather conditions.

Wet Weather Earthwork

Soils underlying the site are likely to be moisture sensitive and may be difficult to handle or traverse with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. Earthwork performed during the wet-weather season will probably require expensive measures such as cement treatment or imported granular material to compact fill to the recommended engineering specifications. If earthwork is to be performed or fill is to be placed in wet weather or under wet conditions when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean engineered fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance. Under some circumstances, it may be necessary to excavate soils with a backhoe to minimize subgrade disturbance caused by equipment traffic;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Material used as engineered fill should consist of clean, granular soil containing less than 5 percent fines. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;

- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction and site drainage is achieved; and
- Geotextile silt fences, straw wattles, and fiber rolls should be strategically located to control erosion.

If cement or lime treatment is used to facilitate wet weather construction, GeoPacific should be contacted to provide additional recommendations and field monitoring.

Erosion Control Considerations

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion except in areas of moderately to steeply sloping topography. In our opinion, the primary concern regarding erosion potential will occur during construction, in areas that have been stripped of vegetation. Erosion at the site during construction can be minimized by implementing the project erosion control plan, which should include judicious use of straw bales and silt fences. If used, these erosion control devices should be in place and remain in place throughout site preparation and construction.

Erosion and sedimentation of exposed soils can also be minimized by quickly re-vegetating exposed areas of soil, and by staging construction such that large areas of the project site are not denuded and exposed at the same time. Areas of exposed soil requiring immediate and/or temporary protection against exposure should be covered with either mulch or erosion control netting/blankets. Areas of exposed soil requiring permanent stabilization should be seeded with an approved grass seed mixture, or hydroseeded with an approved seed-mulch-fertilizer mixture.

Pavement Design

For design purposes, we used an estimated resilient modulus of 9,000 for compacted native soil. Table 3 presents our recommended minimum pavement section for dry weather construction.

Table 3. Recommended Minimum Dry-Weather Pavement Section

Material Layer	Light-duty Public Streets	Compaction Standard
Asphaltic Concrete (AC)	3 in.	92% of Rice Density AASHTO T-209
Crushed Aggregate Base ¾"-0 (leveling course)	2 in.	95% of Modified Proctor AASHTO T-180
Crushed Aggregate Base 1½"-0	8 in.	95% of Modified Proctor AASHTO T-180
Subgrade	12 in.	95% of Standard Proctor AASHTO T-99 or equivalent

Any pockets of organic debris or loose fill encountered during ripping or tilling should be removed and replaced with engineered fill (see *Site Preparation* Section). In order to verify subgrade strength, we recommend proof-rolling directly on subgrade with a loaded dump truck during dry weather and on top of base course in wet weather. Soft areas that pump, rut, or weave should be stabilized prior to paving. If pavement areas are to be constructed during wet weather, the subgrade and construction plan should be reviewed by the project geotechnical engineer at the

time of construction so that condition specific recommendations can be provided. The moisture sensitive subgrade soils make the site a difficult wet weather construction project.

During placement of pavement section materials, density testing should be performed to verify compliance with project specifications. Generally, one subgrade, one base course, and one asphalt compaction test is performed for every 100 to 200 linear feet of paving.

Spread Foundations

The proposed residential structures may be supported on shallow foundations bearing on competent undisturbed, native soils and/or engineered fill, appropriately designed and constructed as recommended in this report. Foundation design, construction, and setback requirements should conform to the applicable building code at the time of construction. For maximization of bearing strength and protection against frost heave, spread footings should be embedded at a minimum depth of 18 inches below exterior grade. The recommended minimum widths for continuous footings supporting wood-framed walls without masonry are 12 inches for single-story, 15 inches for two-story, and 18 inches for three-story structures. Minimum foundation reinforcement should consist of a No. 4 bar at the top of stem walls, and a No. 4 bar at the bottom of the footings.

The anticipated allowable soil bearing pressure is 1,500 lbs/ft^2 for footings bearing on competent, native soil and/or engineered fill. A maximum chimney and column load of 30 kips is recommended for the site. The recommended maximum allowable bearing pressure may be increased by 1/3 for short-term transient conditions such as wind and seismic loading. For heavier loads, the geotechnical engineer should be consulted. The coefficient of friction between on-site soil and poured-in-place concrete may be taken as 0.45, which includes no factor of safety. The maximum anticipated total and differential footing movements (generally from soil expansion and/or settlement) are 1 inch and ¾ inch over a span of 20 feet, respectively. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied. Excavations near structural footings should not extend within a 1H:1V plane projected downward from the bottom edge of footings.

Footing excavations should penetrate through topsoil and any loose soil to competent subgrade that is suitable for bearing support. All footing excavations should be trimmed neat, and all loose or softened soil should be removed from the excavation bottom prior to placing reinforcing steel bars. Due to the moisture sensitivity of on-site native soils, foundations constructed during the wet weather season may require overexcavation of footings and backfill with compacted, crushed aggregate.

Our recommendations are for house construction incorporating raised wood floors and conventional spread footing foundations. If living space of the structures will incorporate basements, a geotechnical engineer should be consulted to make additional recommendations for retaining walls, water-proofing, underslab drainage and wall subdrains. After site development, a Final Soil Engineer's Report should either confirm or modify the above recommendations.

Seismic Design

The Oregon Department of Geology and Mineral Industries (Dogami), Oregon HazVu: 2017 Statewide GeoHazards Viewer indicates that the site is in an area where *very strong* ground shaking is anticipated during an earthquake (Dogami HazVu, 2017). Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2015 International Building Code (IBC) with applicable Oregon Structural Specialty Code (OSSC) revisions (current 2014). We recommend Site Class D be used for design per the OSSC, Table

1613.5.2 and as defined in ASCE 7, Chapter 20, Table 20.3-1. Design values determined for the site using the USGS (United States Geological Survey) 2017 Seismic Design Maps Summary Report are summarized in Table 4, and are based upon existing soil conditions.

Table 4. Recommended Earthquake Ground Motion Parameters (2010 ASCE-7)

Parameter	Value
Location (Lat, Long), degrees	45.321, -122.619
Mapped Spectral Acceleration Values (MCE):	
Peak Ground Acceleration PGA_M	0.439
Short Period, S_s	0.914 g
1.0 Sec Period, S_1	0.397 g
Soil Factors for Site Class D:	
F_a	1.134
F_v	1.606
Residential Site Value = 2/3 x F_a x S_s	0.691 g
Residential Seismic Design Category	D

Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to earthquake shaking. Soil liquefaction is generally limited to loose, granular soils located below the water table. According to the Oregon HazVu: Statewide Geohazards Viewer, the subject site is regionally characterized as having a low risk of soil liquefaction (DOGAMI:HazVu, 2017).

Footing and Roof Drains

Construction should include typical measures for controlling subsurface water beneath the homes, including positive crawlspace drainage to an adequate low-point drain exiting the foundation, visqueen covering the expose ground in the crawlspace, and crawlspace ventilation (foundation vents). The homebuyers should be informed and educated that some slow flowing water in the crawlspaces is considered normal and not necessarily detrimental to the home given these other design elements incorporated into its construction. Appropriate design professionals should be consulted regarding crawlspace ventilation, building material selection and mold prevention issues, which are outside GeoPacific's area of expertise.

Down spouts and roof drains should collect roof water in a system separate from the footing drains to reduce the potential for clogging. Roof drain water should be directed to an appropriate discharge point and storm system well away from structural foundations. Grades should be sloped downward and away from buildings to reduce the potential for ponded water near structures.

If the proposed structures will have a raised floor, and no concrete slab-on-grade floors in living spaces are used, perimeter footing drains would not be required based on soil conditions encountered at the site and experience with standard local construction practices. Where it is desired to reduce the potential for moist crawl spaces, footing drains may be installed. If concrete slab-on-grade floors are used, perimeter footing drains should be installed as recommended below.

Where necessary, perimeter footing drains should consist of 3 or 4-inch diameter, perforated plastic pipe embedded in a minimum of 1 ft^3 per lineal foot of clean, free-draining drain rock. The drain pipe and surrounding drain rock should be wrapped in non-woven geotextile (Mirafi 140N, or approved equivalent) to minimize the potential for clogging and/or ground loss due to piping. A

minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. In our opinion, footing drains may outlet at the curb, or on the back sides of lots where sufficient fall is not available to allow drainage to meet the street.

UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and their consultants for use in design of this project only. This report should be provided in its entirety to prospective contractors for bidding and estimating purposes; however, the conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. The checklist attached to this report outlines recommended geotechnical observations and testing for the project. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, GeoPacific executed these services in accordance with generally accepted professional principles and practices in the field of geotechnical engineering at the time the report was prepared. No warranty, expressed or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.

CERTIFIED OREGON ELIZABETH K. RAPP No. E2180 ENGINEERING GEOLOGIST

REGISTERED PROFESSIONAL ENGINEER 14743PE OREGON JAN. 23, 1990 JAMES D. IMBRIE

EXPIRES: 06/30/2019

Beth K. Rapp, C.E.G.
Senior Engineering Geologist

James D. Imbrie, P.E.
Principal Engineer

Attachments: References
Figure 1A – Vicinity Map
Figure 1B – Lidar Based Vicinity Map with Mapped Landslides
Figure 2 – Site Plan and Exploration Locations
Test Pit Logs (TP-1 through TP-10)
Boring Logs (B-1 & B-2)

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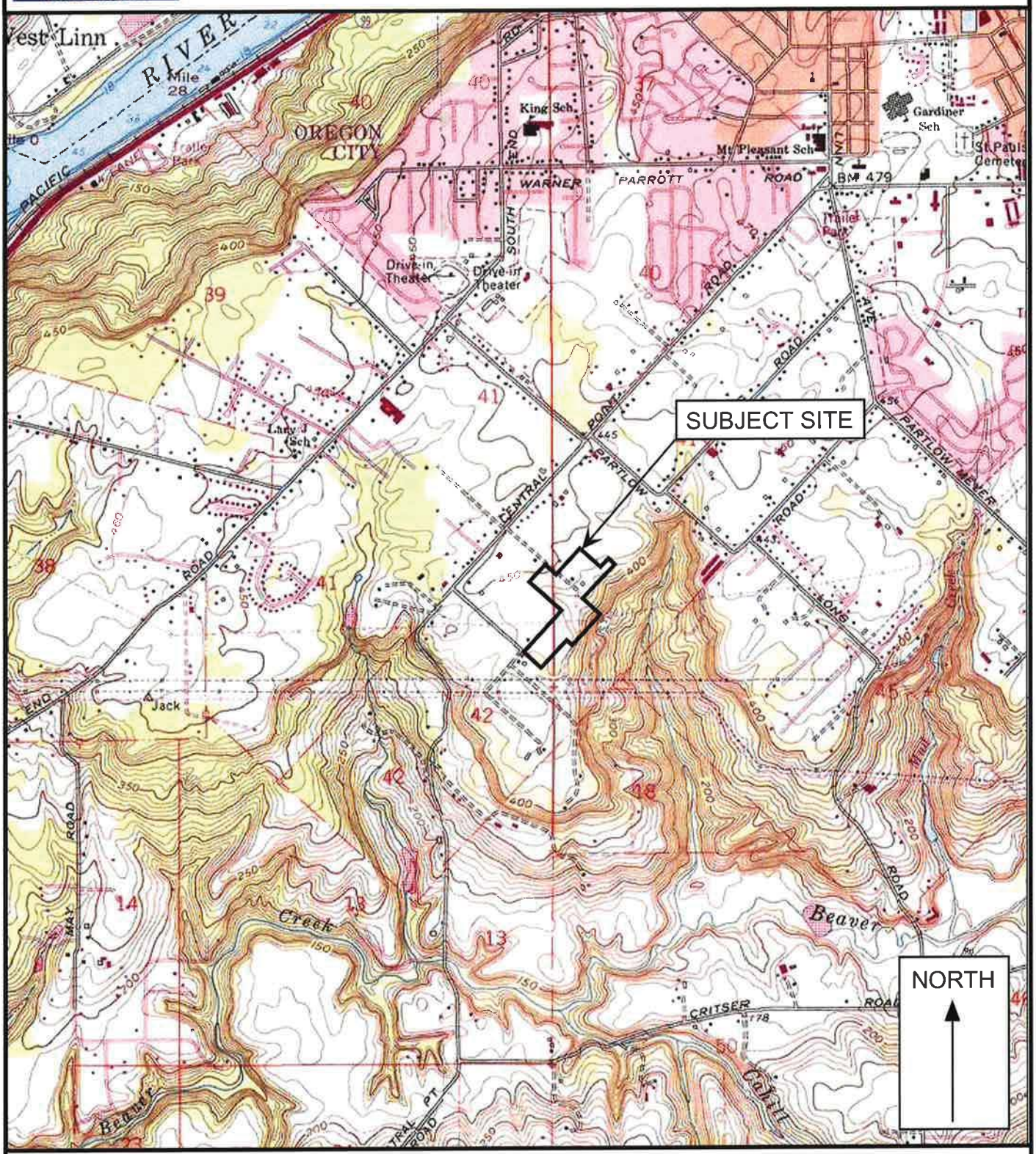
VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 ft

Date: 6/16/2017

Drawn by: SRS

Base maps: U.S. Geological Survey 7.5 minute Topographic Map Series, Canby, Oregon Quadrangle, 1961 (Photorevised 1985) and Oregon City, Oregon Quadrangle, 1961 (Photorevised 1985).

Project: Wheeler Farms Oregon City, Oregon	Project No. 17-4521	FIGURE 1A

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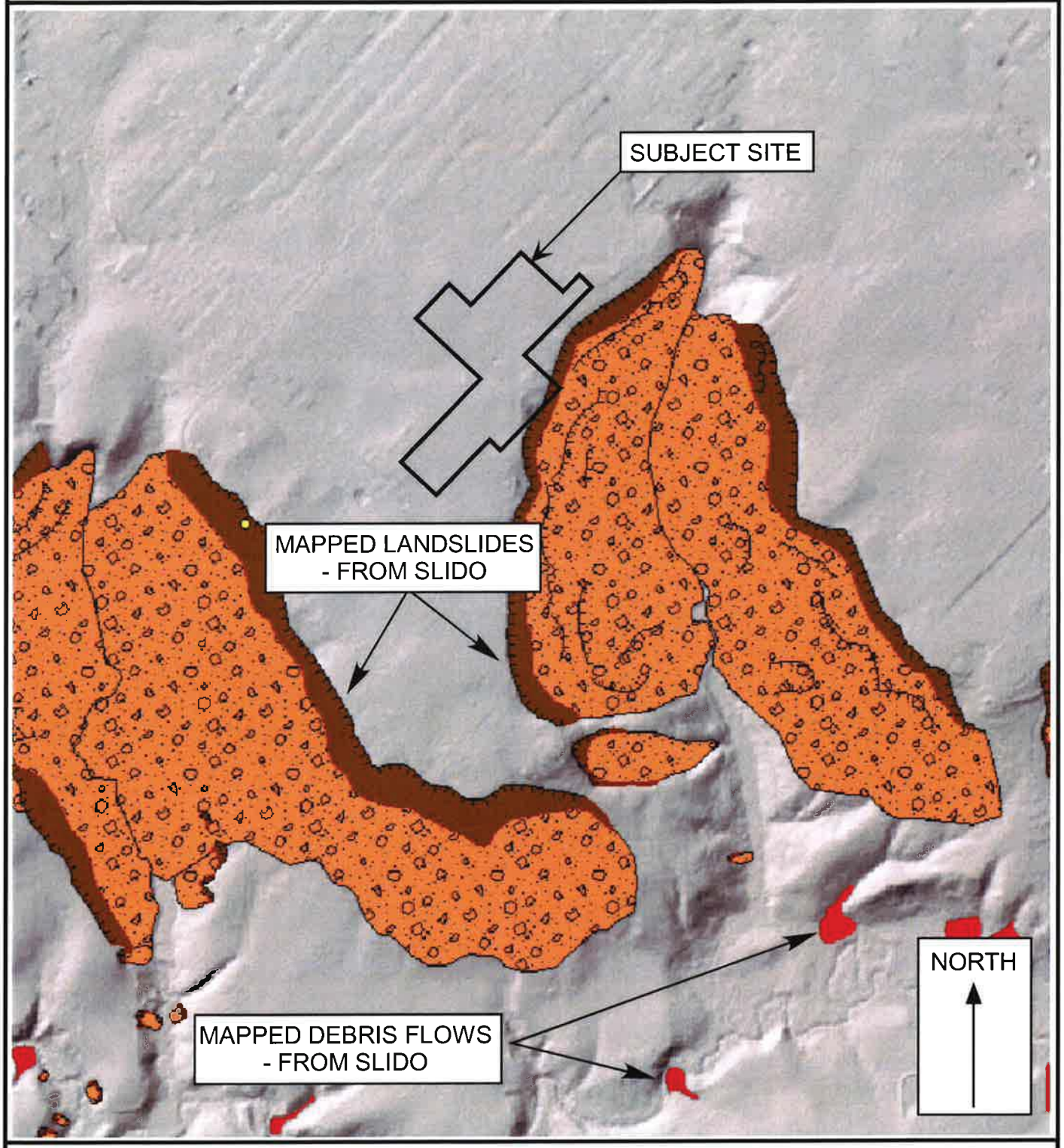
LIDAR BASED VICINITY MAP - WITH MAPPED LANDSLIDES



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Approximate Scale 1 in = 1000 ft

Date: 6/16/2017
Drawn by: SRS

Base map: Oregon Department of Geology and Mineral Industries, 2017, Statewide Landslide Information Database for Oregon (SLIDO): http://www.oregongeology.org/slido/index.html

Project: Wheeler Farms Oregon City, Oregon	Project No. 17-4521	FIGURE 1B

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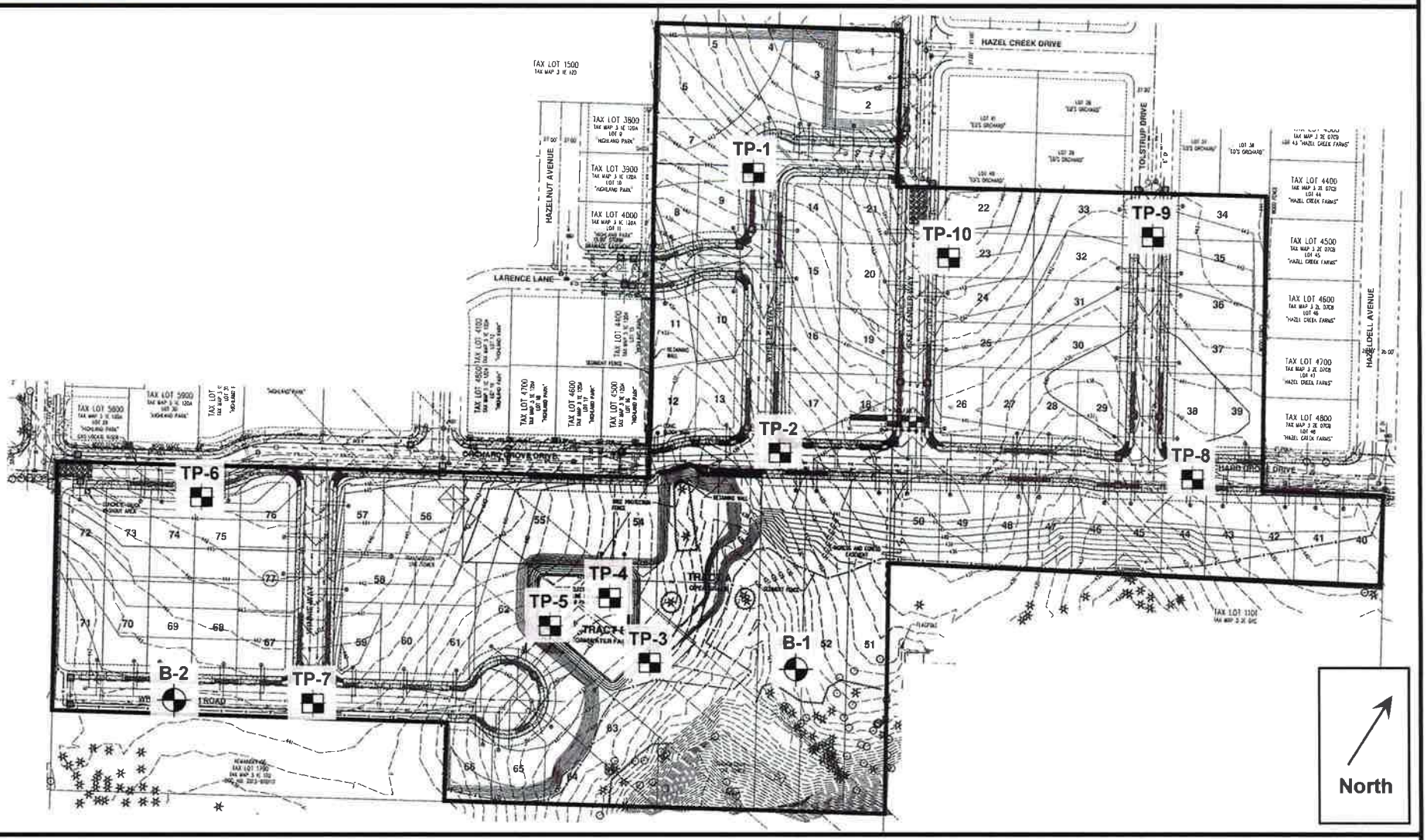
SITE PLAN AND EXPLORATION LOCATIONS



Legend

TP-1 — Test Pit Designation and Approximate Location

B-1 — Boring Designation and Approximate Location

0 200'

APPROXIMATE SCALE 1"=200'

Date: 6/16/2017
Drawn by: EKR

Project: Wheeler Farms Oregon City, Oregon	Project No. 17-4521	FIGURE 2

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TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-1**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately organic SILT (OL-ML), trace clay, brown, loose, 2 inch thick root mat, moist (Topsoil)
2	2.0					Stiff, clayey SILT (ML) to silty CLAY (CL), light brown, moist, (Residual Soil)
3	4.0					
4	3.0					Extremely soft to very soft (R0-R1), highly weathered BASALT, trace light reddish brown silty clay matrix, gray to brown, trace black staining, trace fine roots, moist (Boring Lava Formation)
5						
6						Trace subrounded soft (R2) boulders up to 2 feet in diameter below 5½ feet below ground surface
7						
8						
9						
10						
11						Test Pit Terminated at 10½ Feet.
12						Note: No seepage or groundwater encountered.

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-2**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
0						Moderately organic SILT (OL-ML), brown, loose, 3 inch thick root mat, trace roots throughout, moist (Topsoil)
1	1.5					Stiff to very stiff, clayey SILT (ML) to silty CLAY (CL), trace subrounded gray weathered basalt, light brown, trace roots, trace charcoal, moist, (Residual Soil)
2	2.0					
3	3.0					
4	3.0					Extremely soft to very soft (R0-R1), highly weathered BASALT, trace light reddish brown silty clay matrix, gray to brown, trace black staining, trace roots to 4 feet below ground surface, moist (Boring Lava Formation)
5						Some soft (R2) zones and boulders below 5 feet below ground surface
6						
7						
8						
9						
10						
11						Test Pit Terminated at 10½ Feet.
12						Note: No seepage or groundwater encountered.

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-3**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately organic SILT (OL-ML), dark brown, loose, roots throughout, moist (Topsoil)
2	1.5					Stiff to very stiff, silty CLAY (CL), trace highly weathered gray basalt, light reddish brown, trace black staining, trace roots to 2½ feet below ground surface, moist (Residual Soil)
3	2.5					
4	2.5					Extremely soft to very soft (R0-R1), weathered BASALT, light reddish brown silty clay matrix, gray to brown, moist (Boring Lava Formation)
5						
6						
7						
8						
9						
10						Becomes very soft to soft (R1-R2) below 10 feet below ground surface
11						
12						Test Pit Terminated at 12 Feet. Note: No seepage or groundwater encountered.

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-4**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately organic SILT (OL-ML), brown, loose, roots throughout, moist (Topsoil)
2	2.0					Stiff to very stiff, silty CLAY (CL), trace weathered gray basalt, light reddish brown, moist (Residual Soil)
3	3.0					
4	4.0					
5						
6						
7						
8						
9						Extremely soft to very soft (R0-R1), highly weathered BASALT, trace light reddish brown silty clay matrix, gray to brown, moist (Boring Lava Formation)
10						
11						
12						Test Pit Terminated at 12 Feet.
						Note: No seepage or groundwater encountered.

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-5**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
0						Moderately organic SILT (OL-ML), dark brown, loose, roots throughout, moist (Topsoil)
1	2.0					Stiff to very stiff, silty CLAY (CL), trace weathered gray basalt, light reddish brown, trace black staining, trace roots to 4 feet below ground surface, moist (Residual Soil)
2	2.0					
3	3.5					
4	4.5					
5						
6						Extremely soft to very soft (R0-R1), highly weathered BASALT, light reddish brown silty clay matrix, gray to brown, trace black staining, trace soft (R2) boulders, trace white secondary mineralization, moist (Boring Lava Formation)
7						
8						
9						
10						
11						
12						Test Pit Terminated at 12 Feet.
						Note: No seepage or groundwater encountered.

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Wheeler Farms Subdivision Oregon City, Oregon	Project No. 17-4521	Test Pit No. **TP-6**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately organic SILT (OL-ML), dark brown, loose, 3 inch thick root mat, moist (Topsoil)
2	2.5					Stiff to very stiff, silty CLAY (CL), light reddish brown, trace black staining, trace roots, moist (Residual Soil)
3	3.5					
4	4.0					
5						
6						
7						Extremely soft (R0), highly weathered BASALT, trace light reddish brown silty clay matrix, gray to brown, moist (Boring Lava Formation)
8						
9						
10						Test Pit Terminated at 10 Feet. Note: No seepage or groundwater encountered.
11						
12						

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Wheeler Farms Subdivision Oregon City, Oregon	Project No. 17-4521	Test Pit No. **TP-7**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	2.0					Moderately organic SILT (OL-ML), brown, loose, fine roots throughout, moist (Topsoil)
2	2.0					Very stiff, clayey SILT (ML) to silty CLAY (CL), subrounded gray basalt below 4 feet below ground surface, trace light reddish brown, mottled, trace black staining, moist (Residual Soil)
3	4.5					
4	4.5					
5						
6						
7						
8						Extremely soft (R0), highly weathered BASALT, trace clayey silt to silty clay matrix, brown to gray, moist (Boring Lava Formation)
9						
10						
11						Test Pit Terminated at 11 Feet. Note: No seepage or groundwater encountered.
12						

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-8**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
0						Moderately organic SILT (OL-ML), dark brown, loose, 3 inch thick root mat, fine roots throughout, moist (Topsoil)
1	1.5					Very stiff, clayey SILT (ML) to silty CLAY (CL), trace gray basalt, light reddish brown, trace black staining, trace roots to 4 feet below ground surface, moist (Residual Soil)
	3.5					
2	1.0					
	2.0					
3	3.0					
4	4.5					Extremely soft to very soft (R0-R1), highly weathered BASALT, trace light reddish brown silty clay matrix, trace soft (R2) boulders at 5 feet below ground surface, moist (Boring Lava Formation)
5						
6						
7						
8						
9						
10						
11						Test Pit Terminated at 11 Feet.
12						Note: No seepage or groundwater encountered.

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-9**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
						Moderately organic SILT (OL-ML), dark brown, loose, 5 inch thick root mat, trace fine roots, moist (Topsoil)
1	1.0					Stiff to very stiff, clayey SILT (ML) to silty CLAY (CL), trace gray basalt, light brown, moist (Residual Soil)
	2.0					
2	2.5					
3	4.5					
4	4.5					Extremely soft to very soft (R0-R1), highly weathered, BASALT, trace silty clay matrix, brown to gray, secondary mineralization, moist (Boring Lava Formation)
5						
6						
7						
8						
9						
10						
11						Test Pit Terminated at 10½ Feet.
12						Note: Groundwater seepage encountered at 6 feet. Discharge visually estimated at less than ¼ gallon per minute.

LEGEND

Bag Sample (100 to 1,000 g) | Bucket Sample (5 Gal. Bucket) | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Wheeler Farms Subdivision
Oregon City, Oregon

Project No. 17-4521

Test Pit No. **TP-10**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
						Moderately organic SILT (OL-ML), dark brown, loose, 5 inch thick root mat, trace fine roots, moist (Topsoil)
1	1.0					Stiff to very stiff, clayey SILT (ML) to silty CLAY (CL), trace weathered basalt, light brown, roots to 2½ feet below ground surface, moist (Residual Soil)
	2.0					
2	2.0					
3	2.5					
4	4.5					Extremely soft (R0), highly weathered, BASALT, trace light reddish brown clayey silt to silty clay matrix, gray brown, secondary mineralization, moist (Boring Lava Formation)
5						
6						
7						
8						
9						
10						Test Pit Terminated at 10 Feet.
11						Note: No seepage or groundwater encountered.
12						

LEGEND

Bag Sample

Bucket Sample

Shelby Tube Sample

Seepage

Water Bearing Zone

Water Level at Abandonment

Date Excavated: 4/20/2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

BORING LOG

Project: Wheeler Farms Subdivision Oregon City, Oregon	Project No. 17-4521	Boring No. **B-1**

Depth (ft)	Sample Type	N-Value	Installation	Moisture Content (%)	Water Bearing Zone	Material Description
						Moderately organic, SILT (OL-ML), brown, trace fine roots, moist (Topsoil)
						Stiff, clayey SILT (ML) to silty CLAY (CL), trace basalt, brown, moist (Residual Soil)
		4				Medium stiff, extremely soft (R0), BASALT, trace light reddish brown silty clay to clayey silt matrix, gray, trace red staining, moist (Boring Lava Formation)
5		8				
		11				Stiff, extremely soft (R0) to very soft (R1), BASALT, trace light reddish brown silty clay to clayey silt matrix, gray, trace red staining, moist (Boring Lava Formation)
10		50 for 1"				Hard, soft (R2) to medium hard (R3), BASALT, trace light reddish brown silty clay to clayey silt matrix, gray, trace red staining, moist (Boring Lava Formation)
15		50 for <1"				
20		18				Very stiff, clayey SILT (ML), trace fine grained sand, light brown, strong dark red mottling, trace waxy texture, dark brown staining, micaceous, uniform, no bedding planes, moist (Residual Soil of Troutdale Formation)
25		14				
30		50 for 4½"				Hard, extremely soft (R0) to very soft (R1) MUDSTONE, brown to brownish gray, trace yellow and green secondary mineralization, micaceous, trace laminar bedding, moist (Troutdale Formation)
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Excavated:
5/9/2017 to 5/10-2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

BORING LOG

Project: Wheeler Farms Subdivision Oregon City, Oregon	Project No. 17-4521	Boring No. **B-1**

Depth (ft)	Sample Type	N-Value	Installation	Moisture Content (%)	Water Bearing Zone	Material Description
		41				
40		50 for 5½"				
45		53				Hard, extremely soft (R0) to very soft (R1) MUDSTONE, brown to brownish gray, trace yellow and green secondary mineralization, micaceous, trace laminar bedding, moist (Troutdale Formation)
50		65				
55		62				
60		70				Very dense, extremely soft (R0), weathered SANDSTONE, trace silt, gray and brown, weathered to fine to medium grained sand, trace yellow secondary mineralization, micaceous, preserved bedding planes, sugary texture, some zones of extremely soft (R0) mudstone, damp to moist (Troutdale Formation)
65		64				
70						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-09) | Water Bearing Zone

Date Excavated: 5/9/2017 to 5/10-2017

Logged By: B. Rapp

Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

BORING LOG

Project: Wheeler Farms Subdivision Oregon City, Oregon	Project No. 17-4521	Boring No. **B-1**

Depth (ft)	Sample Type	N-Value	Installation	Moisture Content (%)	Water Bearing Zone	Material Description
75		56				
		50 for 5¾"				
80		50 for 5"				Very dense, extremely soft (R0), weathered SANDSTONE, trace silt, gray and brown, weathered to fine to medium grained sand, trace yellow secondary mineralization, micaceous, preserved bedding planes, sugary texture, some zones of extremely soft (R0) mudstone, damp to moist (Troutdale Formation)
85		80				
90		58				
95		75				
100		67				
105						Boring Terminated at 101½ Feet. Groundwater could not be determined due to mud rotary techniques.

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Excavated: 5/9/2017 to 5/10-2017
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

BORING LOG

Project: Wheeler Farms Subdivision Oregon City, Oregon	Project No. 17-4521	Boring No. **B-2**

Depth (ft)	Sample Type	N-Value	Installation	Moisture Content (%)	Water Bearing Zone	Material Description
						Moderately organic, SILT (OL-ML), brown, trace fine roots, moist (Topsoil)
						Stiff to very stiff, clayey SILT (ML) to silty CLAY (CL), trace weathered basalt, light brown, moist (Residual Soil)
5		17				Stiff to very stiff, extremely soft (R0), highly weathered, BASALT, trace light reddish brown silty clay to clayey silt matrix, gray to brown, strong mottling, trace black staining, moist to very moist (Boring Lava Formation)
10		13				
15		18				Very stiff, extremely soft to very soft (R0-R1), highly weathered, BASALT, trace silty clay to clayey silt matrix, gray, trace black staining, red staining, moist to very moist (Boring Lava Formation)
20		50 for 1"				
25						Hard, soft to medium hard (R2-R3), BASALT, gray, trace silty clay to clayey silt matrix, gray, trace black staining, red staining, moist to very moist (Boring Lava Formation)
30						
35		50 for ½"				Boring Terminated at 35 Feet. Groundwater could not be determined due to mud rotary techniques.

LEGEND

Bag Sample

Split-Spoon

Shelby Tube Sample

Static Water Table at Drilling

Static Water Table

Water Bearing Zone

Date Excavated: 5/10/2017
Logged By: B. Rapp
Surface Elevation:

PRELIMINARY SITE PLAN

SCALE: 1"=60 FEET
60 0 24 36 48 60
ON 34" X 24" PAPER

HAZEL CREEK DRIVE
TOLSTRUP DRIVE
HAZELDELL AVENUE
HAZELNUT AVENUE
BLANCHET DRIVE
HYDRANGEA LANE
LARENCE LANE
WHITE LANE
WHEELER WAY
SKELLENGER WAY
WINNIE WAY
ORCHARD GROVE DRIVE
WHEELER FARM ROAD

TAX LOT 1500
TAX MAP 3 1E 12D

LOT 20 "ED'S ORCHARD"
LOT 21 "ED'S ORCHARD"
LOT 22 "ED'S ORCHARD"
LOT 23 "ED'S ORCHARD"
LOT 37 "ED'S ORCHARD"
LOT 36 "ED'S ORCHARD"
LOT 38 "ED'S ORCHARD"
LOT 39 "ED'S ORCHARD"
LOT 40 "ED'S ORCHARD"
LOT 41 "ED'S ORCHARD"

TAX LOT 3800
TAX MAP 3 1E 12DA
LOT 9
"HIGHLAND PARK"

TAX LOT 3900
TAX MAP 3 1E 12DA
LOT 10
"HIGHLAND PARK"

TAX LOT 4000
TAX MAP 3 1E 12DA
LOT 11
"HIGHLAND PARK"

TAX LOT 4300
TAX MAP 3 2E 07CB
LOT 43 "HAZEL CREEK FARMS"

TAX LOT 4400
TAX MAP 3 2E 07CB
LOT 44
"HAZEL CREEK FARMS"

TAX LOT 4500
TAX MAP 3 2E 07CB
LOT 45
"HAZEL CREEK FARMS"

TAX LOT 4600
TAX MAP 3 2E 07CB
LOT 46
"HAZEL CREEK FARMS"

TAX LOT 4700
TAX MAP 3 2E 07CB
LOT 47
"HAZEL CREEK FARMS"

TAX LOT 4800
TAX MAP 3 2E 07CB
LOT 48
"HAZEL CREEK FARMS"

TAX LOT 5500
TAX MAP 3 1E 12DA
LOT 26
"HIGHLAND PARK"

TAX LOT 5400
TAX MAP 3 1E 12DA
LOT 25
"HIGHLAND PARK"

TAX LOT 5300
TAX MAP 3 1E 12DA
LOT 24
"HIGHLAND PARK"

TAX LOT 5600
TAX MAP 3 1E 12DA
LOT 27
"HIGHLAND PARK"

TAX LOT 5700
TAX MAP 3 1E 12DA
LOT 28
"HIGHLAND PARK"

TAX LOT 5800
TAX MAP 3 1E 12DA
LOT 29
"HIGHLAND PARK"

TAX LOT 5900
TAX MAP 3 1E 12DA
LOT 30
"HIGHLAND PARK"

TAX LOT 6000
TAX MAP 3 1E 12DA
LOT 31
"HIGHLAND PARK"

TAX LOT 6100
TAX MAP 3 1E 12DA
LOT 32
"HIGHLAND PARK"

TAX LOT 4400
TAX MAP 3 1E 12DA
LOT 15
"HIGHLAND PARK"

TAX LOT 4800
TAX MAP 3 1E 12DA
LOT 19
"HIGHLAND PARK"

TAX LOT 4700
TAX MAP 3 1E 12DA
LOT 18
"HIGHLAND PARK"

TAX LOT 4600
TAX MAP 3 1E 12DA
LOT 17
"HIGHLAND PARK"

TAX LOT 4500
TAX MAP 3 1E 12DA
LOT 16
"HIGHLAND PARK"

TRACT A
OPEN SPACE

TRACT B
STORMWATER FACILITY

TRANSMISSION LINE TOWER

POSSIBLE WELL

FLAGPOLE

SHOP

GRAVEL

REMAINDER OF
TAX LOT 1790
TAX MAP 3 1E 12D
DOC. NO. 2013-070117

TAX LOT 1101
TAX MAP 3 2E 07C

TAX LOT 1201

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WHEELER FARMS

OREGON CITY

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

OREGON
CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

POST-DEVELOPED CATCHMENT (BASIN MAP)

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE:	06/19/2017

PRELIMINARY
NOT FOR
CONSTRUCTION

REVISIONS

JOB NUMBER
5621

SHEET
1

AKS DRAWING FILE: 5621 BASIN POST.DWG | LAYOUT: POST

BMP SIZING TOOL REPORT

WES BMP Sizing Software Version 1.6.0.1, August 2015

WES BMP Sizing Report

Project Information

Project Name	Wheeler Farms
Project Type	Subdivision
Location	19566 Central Point Road, Oregon City
Stormwater Management Area	30000
Project Applicant	Rian Park Development, Inc.
Jurisdiction	OutofDistrict

Drainage Management Area

Name	Area (sq-ft)	Pre-Project Cover	Post-Project Cover	DMA Soil Type	BMP
Roof (77 Lots)	203,280	Forested	Roofs	C	Pond
Total Pervious Grass	249,972	Forested	Grass	C	Street Swale
Street, Sidewalk and Driveway Approach	186,750	Forested	ConventionalConcrete	C	Street Swale
Total Pervious Landscape	249,971	Forested	LandscapeCsoil	C	Street Swale
Future Roof (7 Lots)	18,480	Forested	Roofs	C	Pond

LID Facility Sizing Details

LID ID	Design Criteria	BMP Type	Facility Soil Type	Minimum Area (sq-ft)	Planned Areas (sq-ft)	Orifice Diameter (in)
Street Swale	WaterQuality	Vegetated Swale - Filtration	C3	5,763.4	9,500.0	3.5

Pond Sizing Details

Pond ID	Design Criteria(1)	Facility Soil Type	Max Depth (ft)(2)	Top Area (sq-ft)	Side Slope (1:H)	Facility Vol. (cu-ft)(3)	Water Storage Vol. (cu-ft)(4)	Adequate Size?
Pond	FCWQT	D1	5.25	17,900.0	3	73,584.5	51,242.3	Yes

1. FCWQT = Flow control and water quality treatment, WQT = Water quality treatment only

2. Depth is measured from the bottom of the facility and includes the three feet of media (drain rock, separation layer and growing media).

3. Maximum volume of the facility. Includes the volume occupied by the media at the bottom of the facility.

4. Maximum water storage volume of the facility. Includes water storage in the three feet of soil media assuming a 40 percent porosity.

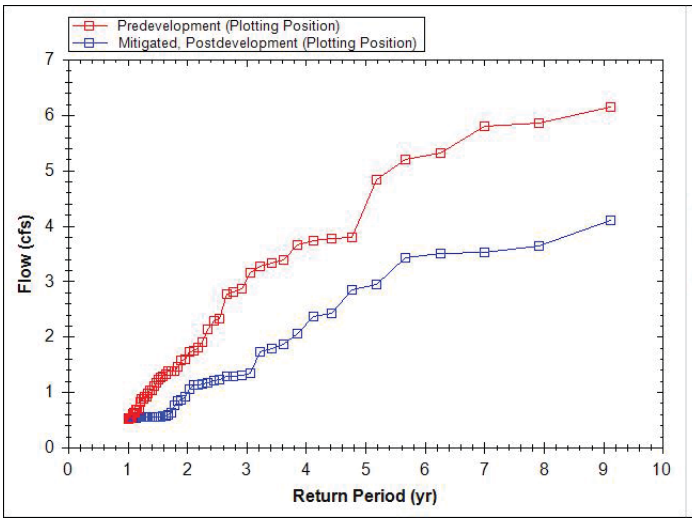
Custom Pond Geometry Configuration

Pond ID: Pond
Design: FlowControlAndTreatment

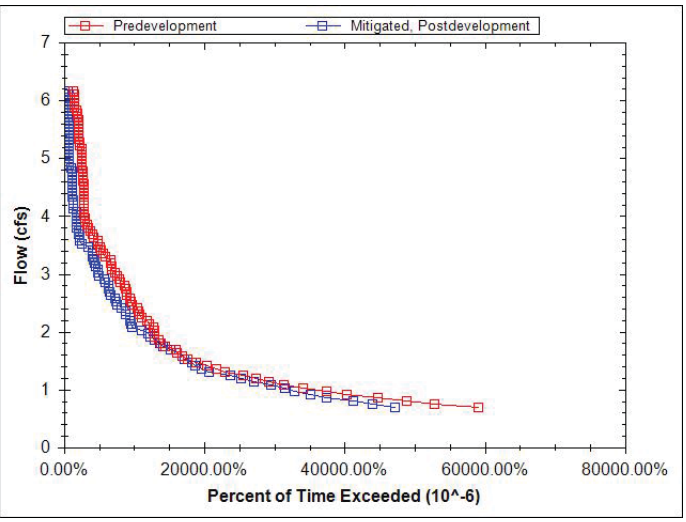
Shape Curve

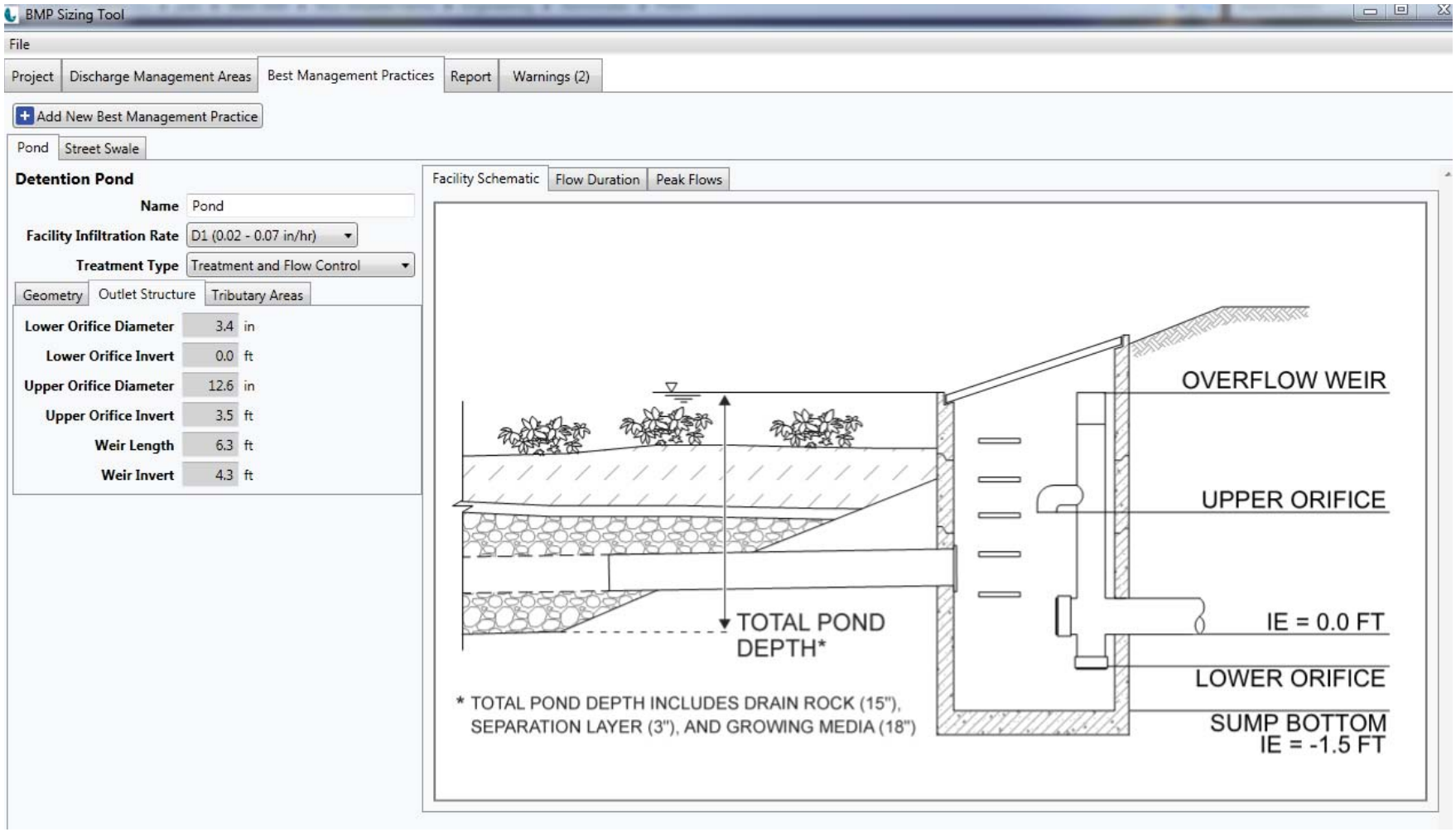
Depth (ft)	Area (sq ft)	Discharge (cfs)
NaN	NaN	NaN

Flow Frequency Chart



Flow Duration Chart




BMP Sizing Tool
File
Project
Discharge Management Areas
Best Management Practices
Report
Warnings (2)
Add New Best Management Practice
Pond
Street Swale
Detention Pond
Name
Pond
Facility Infiltration Rate
D1 (0.02 - 0.07 in/hr)
Treatment Type
Treatment and Flow Control
Geometry
Outlet Structure
Tributary Areas
Lower Orifice Diameter
3.4 in
Lower Orifice Invert
0.0 ft
Upper Orifice Diameter
12.6 in
Upper Orifice Invert
3.5 ft
Weir Length
6.3 ft
Weir Invert
4.3 ft
Facility Schematic
Flow Duration
Peak Flows
OVERFLOW WEIR
UPPER ORIFICE
IE = 0.0 FT
LOWER ORIFICE
SUMP BOTTOM
IE = -1.5 FT
TOTAL POND DEPTH*
* TOTAL POND DEPTH INCLUDES DRAIN ROCK (15"), SEPARATION LAYER (3"), AND GROWING MEDIA (18")

STORMWATER FACILITIES LOCATION

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD STE 100
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FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

WHEELER FARMS

OREGON

OREGON CITY

TAX LOTS 1001, 1100, 1180, AND 1291
TAX LOTS 1700 AND 1790

CLACKAMAS COUNTY TAX MAP 3-2E-07C
CLACKAMAS COUNTY TAX MAP 3-1E-12D

STORMWATER FACILITIES LOCATION

DESIGNED BY:	VHN/NMC
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED
DATE: 06/19/2017	

PRELIMINARY
NOT FOR
CONSTRUCTION

REVISIONS

JOB NUMBER
5621

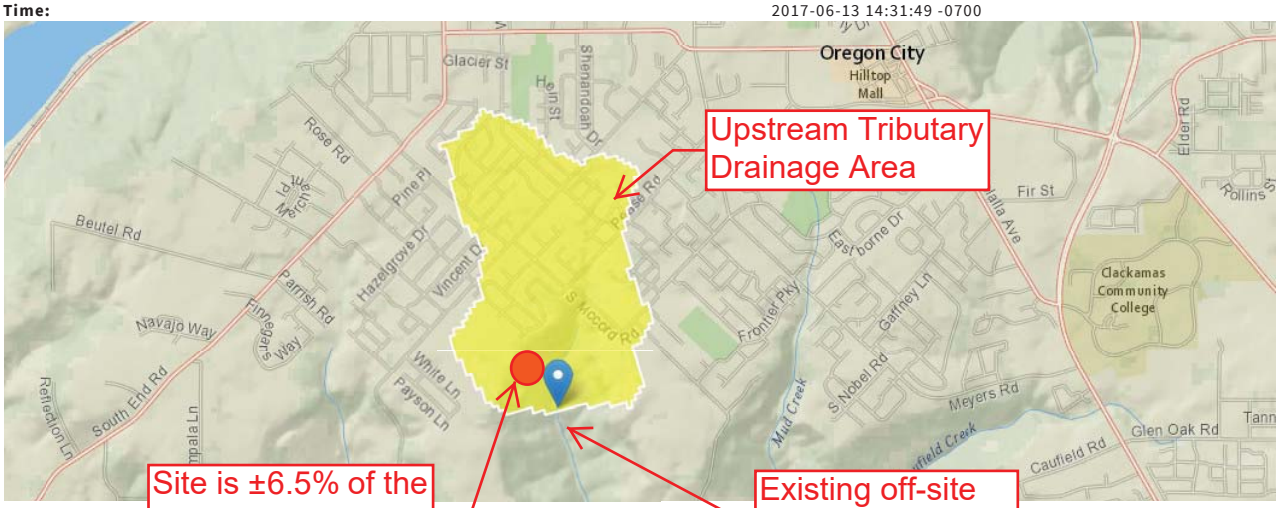
SHEET
1

AKS DRAWING FILE: 5621 BASIN POSTDWG | LAYOUT: LOCATION

DOWNSTREAM ANALYSIS

StreamStats Report

Region ID:	OR
Workspace ID:	OR20170613173107274000
Clicked Point (Latitude, Longitude):	45.31848, -122.61513
Time:	2017-06-13 14:31:49 -0700

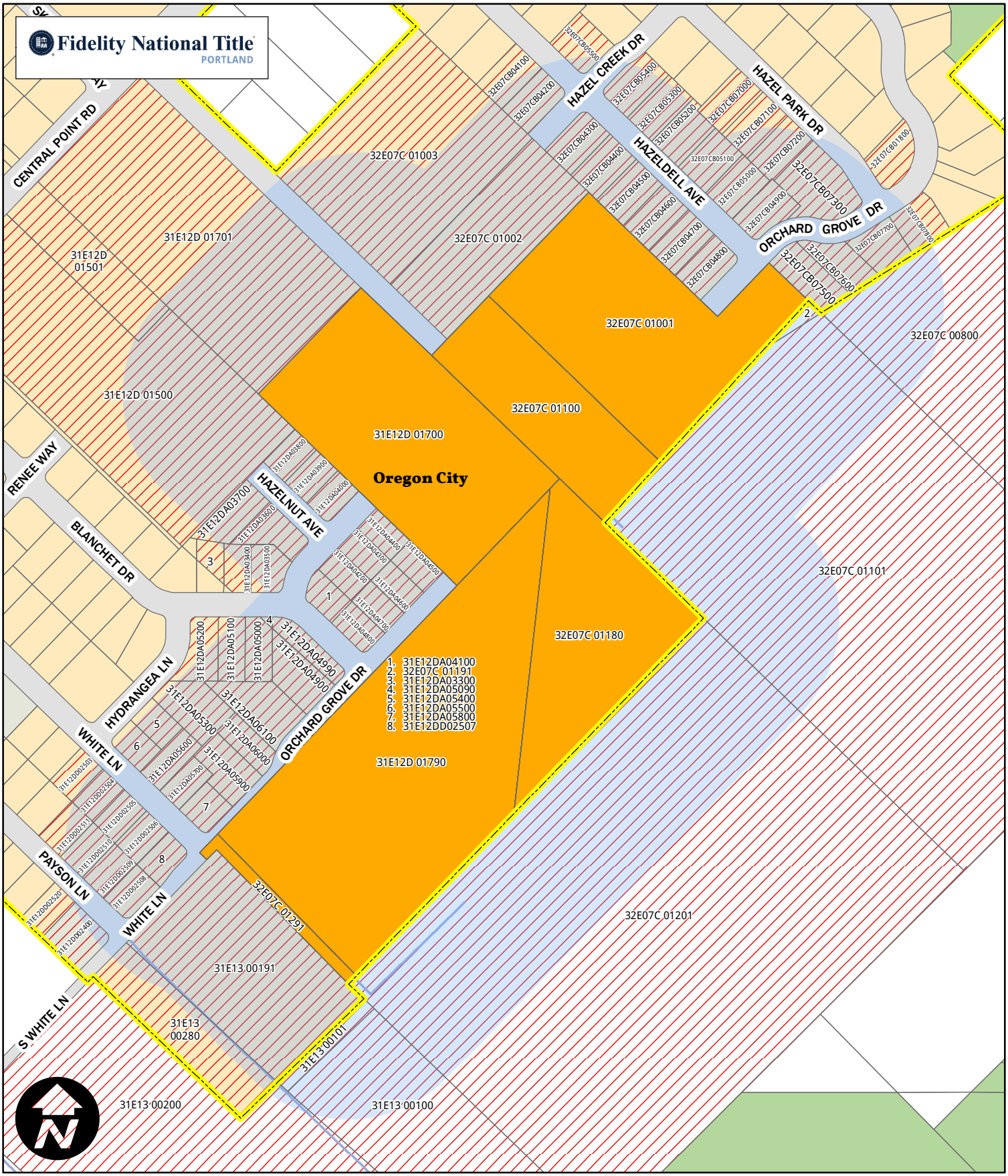


Wheeler Farms

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.55	square miles
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precitation intensity index	1.98	inches
SOILPERM	Average Soil Permeability	0.54	inches per hour
WATCAPORC	Available water capacity from STATSGO data using methods from SIR 2005-5116	0.15	inches
JANMAXT2K	Mean Maximum January Temperature from 2K resolution PRISM 1961-1990 data	46.6	degrees F
ORREG2	Oregon Region Number	10001	dimensionless
BSLOPD	Mean basin slope measured in degrees	3.56	degrees
JANMINT2K	Mean Minimum January Temperature from 2K resolution PRISM PRISM 1961-1990 data	34.3	degrees F
ELEV	Mean Basin Elevation	433	feet
PRECIP	Mean Annual Precipitation	49.3	inches
MINTEMP	Mean annual minimum air temperature over basin surface area as defined in SIR 2008-5126	43	degrees F

Exhibit O: Mailing Labels for 300-Foot Radius Owners



300 Feet

Public Notification Search

Subject | Notification | Incorporated city

Radius | Home Owners Association | City limits

Taxlots | Other

Prepared by: Fidelity National Title
Data: CoreLogic, Metro RLIS
Date: 3/14/2017

This information is reliable, but not guaranteed. It is not a survey.

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31E13 00200
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